

SSC CPO



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PERCENTAGE

01

प्रतिशतता

1. The population of a city is 3,52,314. It increases annually at the rate of 15% per annum. What was its population 2 years ago? किसी शहर की जनसंख्या 3,52,314 है। यदि प्रति वर्ष 15% वार्षिक दर से बढ़ती है। 2 वर्ष पूर्व इसकी जनसंख्या ज्ञात करें।

SSC CPO 03/10/2023 (Shift-01)

- (a) 3,06,360 (b) 2,56,400
(c) 3,02,400 (d) 2,66,400
2. A number is first increased by 10% and then increased by 20%. The number, so obtained, is now decreased by 12%. What is the net increase or decrease per cent in the original number? किसी संख्या में पहले 10% की वृद्धि की जाती है, और फिर 20% की वृद्धि की जाती है। इस प्रकार प्राप्त संख्या में अब 12% की कमी की जाती है। मूल संख्या में निवल वृद्धि या कमी का प्रतिशत कितना है?

SSC CPO 03/10/2023 (Shift-01)

- (a) 12.12% increase
(b) 16.16% increase
(c) 11.11% decrease
(d) 14.14% decrease
3. A man spends 72% of his salary and saves ₹5,740 per month. What is 10% of his annual salary (in ₹)? एक व्यक्ति अपने वेतन का 72% खर्च करता है, और प्रति महीने ₹5,740 की बचत करता है। उसके वार्षिक वेतन का 10% कितना (₹ में) होगा?

SSC CPO 03/10/2023 (Shift-01)

- (a) ₹21600 (b) ₹24600
(c) ₹28400 (d) ₹20500
4. Swastik saves 20% of his income while spends the remaining amount on food, rent, education and shopping. 15% of the income is spent on food, while ₹12,800 is spent on rent, ₹32,000 on education and ₹7,200 on shopping. The amount spent on shopping is 11.25% of the total expenditure. How much money (in ₹) is spent on food?

स्वास्तिक अपनी आय का 20% बचाता है, जबकि शेष राशि भोजन, किराए, शिक्षा और खरीदारी पर खर्च करता है। आय का 15% भोजन पर खर्च किया जाता है, जबकि ₹12,800 किराए पर, ₹32,000 शिक्षा पर और ₹7,200 खरीदारी पर खर्च किए जाते हैं। खरीदारी पर खर्च की गई राशि, कुल खर्च की 11.25% है। भोजन पर कितना धन (₹ में) खर्च किया जाता है?

SSC CPO 03/10/2023 (Shift-02)

- (a) 9600 (b) 12000
(c) 15000 (d) 10800
5. In a village election, Sharukh got 80% of the total valid votes. 10% of the votes were invalid. If the total number of votes was 4500, then find the number of valid votes the other candidate got.

एक ग्रामीण चुनाव में, शारुख को कुल वैध मतों के 80% मत प्राप्त हुए। 10% मत अमान्य थे। यदि मतों की कुल संख्या 4500 थी, तो दूसरे उम्मीदवार को प्राप्त वैध मतों की संख्या ज्ञात कीजिए।

SSC CPO 03/10/2023 (Shift-02)

- (a) 620 (b) 450
(c) 810 (d) 530
6. What is the number of valid votes cast in favour of a candidate in an election, if the candidate received 75% of the total valid votes, and 5% of the total votes were declared invalid, given that the total number of voters was 1,46,000?

यह देखते हुए कि मतदाताओं की कुल संख्या 1,46,000 है, यदि चुनाव में किसी उम्मीदवार को कुल वैध मतों के 75% मत प्राप्त हुए, और कुल मतों के 5% मत अमान्य घोषित किए गए, तो चुनाव में उम्मीदवार के पक्ष में डाले गए वैध मतों की संख्या ज्ञात कीजिए।

SSC CPO 03/10/2023 (Shift-02)

- (a) 1,08,850 (b) 1,04,025
(c) 10,250 (d) 1,06,650

7. In an election, Ajay and Mohan are contesting for the Secretary post in a trade union of 9000 workers. 80% of the workers cast their votes, out of which 20% votes were found invalid. Ajay defeated Mohan by 1152 votes. How many votes did Ajay get?

एक चुनाव में, अजय और मोहन 9000 श्रमिकों के ट्रेड यूनियन में सचिव पद के लिए चुनाव लड़ रहे हैं। 80% कार्यकर्ताओं ने वोट डाले, जिनमें से 20% वोट अवैध पाए गए, अजय ने मोहन को 1152 वोटों से हराया। अजय को कितने वोट मिले?

SSC CPO 03/10/2023 (Shift-3)

- (a) 4480 (b) 3546
(c) 3456 (d) 2304
8. In an election between P and Q, P gets 40% of the total votes and thus loses by 10 votes. The total number of votes is:

P और Q के बीच एक चुनाव में, P को कुल वोटों का 40% वोट मिलता है और इस तरह वह 10 वोटों से हार जाता है। वोटों की कुल संख्या है:

SSC CPO 03/10/2023 (Shift-3)

- (a) 90 (b) 80
(c) 70 (d) 50
9. If the radius of a sphere is doubled, then its surface area will be increased by:

यदि किसी गोले की त्रिज्या दोगुनी कर दी जाए, तो उसका पृष्ठीय क्षेत्रफल बढ़ जाएगा:

SSC CPO 03/10/2023 (Shift-3)

- (a) 200% (b) 100%
(c) 300% (d) 400%
10. In an election between two candidates, 80% of the voters cast their votes, out of which 5% votes were declared invalid. A candidate got 9500 votes which were 80% of the valid votes. Find the total number of voters enrolled in that election.

दो उम्मीदवारों के बीच हुए एक चुनाव में, 80% मतदाताओं ने मतदान किया, जिनमें से 5% मत अमान्य घोषित कर दिए गए। एक उम्मीदवार को 9500 मत मिले, जो वैध मतों के 80% के बराबर थे। उस चुनाव में नामांकित मतदाताओं की कुल संख्या ज्ञात कीजिए।

SSC CPO 04/10/2023 (Shift-01)

- (a) 14780 (b) 15625
(c) 16100 (d) 15100

11. The fraction equivalent to $\frac{1}{5}\%$ is:

निम्न में से कौन-सा $\frac{1}{5}\%$ के समतुल्य भिन्न है?

SSC CPO 04/10/2023 (Shift-01)

- (a) $\frac{1}{125}$ (b) $\frac{1}{500}$
(c) $\frac{1}{200}$ (d) $\frac{1}{40}$

12. Avi sold a house to Bhargav at a gain of 10% and Bhargav sold it to Chetan at a gain of 20%. If Chetan paid ₹2,64,00,000 for it, then at what price must Avi have purchased it?

अवि ने भार्गव को एक घर 10% के लाभ पर बेचा, और भार्गव ने इसे चेतन को 20% के लाभ पर बेच दिया। यदि चेतन ने इसके लिए ₹2,64,00,000 का भुगतान किया, तो अवि ने इसे किस मूल्य पर खरीदा होगा?

SSC CPO 04/10/2023 (Shift-01)

- (a) ₹2,50,00,000
(b) ₹1,75,00,000
(c) ₹2,30,00,000
(d) ₹2,00,00,000

13. A number is first decreased by 28% and then increased by 28%. The number so obtained is 784 less than the original number. Find the value of the original number.

एक संख्या में पहले 28% की कमी की जाती है, और फिर 28% की वृद्धि की जाती है। इस प्रकार प्राप्त संख्या मूल संख्या से 784 कम है। मूल संख्या ज्ञात करें।

SSC CPO 04/10/2023 (Shift-02)

- (a) 15000 (b) 1500
(c) 10000 (d) 1000

14. The price of a stock increased by 30% in the first year and decreased by 20% in the second year. If an investor bought 100 shares of the stock for ₹1,000, then what is the final value of the investment after 2 years?

एक स्टॉक का मूल्य पहले वर्ष में 30% बढ़ जाती है, और दूसरे वर्ष में 20% घट जाती है। यदि एक निवेशक ने ₹1,000 में उस स्टॉक के 100 शेयर खरीदे तो 2 वर्ष बाद निवेश का अंतिम मूल्य कितना होगा?

SSC CPO 04/10/2023 (Shift-02)

- (a) ₹960 (b) ₹1,400
(c) ₹1,020 (d) ₹1,040

15. The price of almonds is increased by 10%. By what percentage should the consumption be decreased so that the expenditure remains the same?

बादाम के मूल्य में 10% की वृद्धि होने पर बादाम की खपत में कितने प्रतिशत की कमी की जानी चाहिए ताकि उस पर होने वाला खर्च पूर्ववत् ही रहे?

SSC CPO 04/10/2023 (Shift-02)

- (a) $8\frac{1}{11}\%$ (b) $5\frac{3}{11}\%$
(c) $10\frac{3}{11}\%$ (d) $9\frac{1}{11}\%$

16. In an election between two candidates, 30% of the electorate did not cast their votes. 20% of the votes polled were found invalid. The winning candidate got 64% of the valid votes and won by a majority of 3136 votes. Find the number of voters enrolled in the voter list.

दो उम्मीदवारों के बीच हुए चुनाव में 30% मतदाताओं ने अपना वोट नहीं डाला। डाले गए 20% वोट अवैध पाए गए। विजयी उम्मीदवार को 64% वैध वोट मिले और वह 3136 वोटों के बहुमत से जीत गया। मतदाता सूची में नामांकित मतदाताओं की संख्या ज्ञात करें।

SSC CPO 03/10/2023 (Shift-3)

- (a) 24000 (b) 20000
(c) 25000 (d) 30000

17. The monthly salary of a person is Rs.50,000. He spends 40% of his salary on household expenses, 25% on rent, and 15% on transportation, and saves the remaining amount. What is his yearly savings?

एक व्यक्ति का मासिक वेतन 50,000 रुपये है। वह अपने वेतन का 40% घरेलू खर्च पर, 25% किराए पर और 15% परिवहन पर खर्च करता है, और शेष राशि बचाता है। उसकी वार्षिक बचत क्या है?

SSC CPO 04/10/2023 (Shift-3)

- (a) ₹1,20,000 (b) ₹1,10,000
(c) ₹1,00,000 (d) ₹90,000

18. If the base radius and the height of a right circular cone are increased by 10%, then the percentage increase in the volume is:

यदि एक लंब वृत्तीय शंकु के आधार की त्रिज्या और ऊंचाई में 10% की वृद्धि की जाती है, तो आयतन में प्रतिशत वृद्धि है:

SSC CPO 04/10/2023 (Shift-3)

- (a) 33.1% (b) 20.2%
(c) 22.1% (d) 30.2%

19. In an election between two candidates, the difference between the candidates who won and lost was 2,500 votes. The candidate who won got 75% of the votes, and there were no invalid votes. The total number of votes polled of the losing candidate was:

दो उम्मीदवारों के बीच एक चुनाव में जीतने और हारने वाले उम्मीदवारों के बीच का अंतर 2,500 वोटों का था। जीतने वाले उम्मीदवार को 75% वोट मिले, और कोई भी अवैध वोट नहीं था। हारने वाले उम्मीदवार को प्राप्त मतों की कुल संख्या थी:

SSC CPO 04/10/2023 (Shift-3)

- (a) 1875 (b) 1250
(c) 5000 (d) 3750

20. In an election between two candidates, 20% of the voters on the voters list did not cast their votes and 80 voters cast their ballot papers blank. The winner secured 45% of all the voters in the list and he got 280 votes more than his rival. The number of voters on the list was:

दो उम्मीदवारों के बीच हुए एक चुनाव में, मतदाता सूची के 20% मतदाताओं ने मतदान नहीं किया, और 80 मतदाताओं ने अपने मतपत्र खाली छोड़ दिए। विजेता उम्मीदवार ने मतदाता सूची में दर्ज कुल मतदाताओं के 45% मत प्राप्त किए, और उसे अपने विरोधी उम्मीदवार से 280 मत अधिक मिले। सूची में मतदाताओं की संख्या कितनी थी?

SSC CPO 05/10/2023 (Shift-01)

- (a) 2000 (b) 2800
(c) 2500 (d) 1500

21. Rupu's income is 20% more than Madhu's income. Madhu's income is less than Rupu's income by:

रूपू की आय, मधु की आय से 20% अधिक है। मधु की आय रूपू की आय से कितने प्रतिशत कम है?

SSC CPO 05/10/2023 (Shift-01)

- (a) $17\frac{2}{3}\%$ (b) $16\frac{2}{3}\%$
(c) $18\frac{2}{3}\%$ (d) 20%
22. A family earns Rs.75,000, out of which 10% is saved. 30% of the expenditure is incurred on education, while Rs.30,375 is spent on health and the remaining amount is spent on food. What is the percentage of food expenditure to the total income?
एक परिवार 75,000 रुपये कमाता है, जिसमें से 10% बचा लिया जाता है। 30% खर्च शिक्षा पर किया जाता है, जबकि 30,375 रुपये स्वास्थ्य पर खर्च किया जाता है और शेष राशि भोजन पर खर्च की जाती है। कुल आय में भोजन व्यय का प्रतिशत कितना है?
- SSC CPO 05/10/2023 (Shift-2)**
- (a) 20% (b) 21.5%
(c) 22.5% (d) 32.5%
23. Three candidates contested an election and won 1136, 7636 and 11628 votes, respectively. What percentage of the total votes did the winning candidate get?
तीन उम्मीदवारों ने एक चुनाव लड़ा और क्रमशः 1136, 7636 और 11628 वोट जीते। विजयी उम्मीदवार को कुल मतों का कितना प्रतिशत प्राप्त हुआ?
- SSC CPO 05/10/2023 (Shift-2)**
- (a) 57% (b) 45%
(c) 49% (d) 33%
24. If 30% of Ravi's income is equal to 40% of Suresh's income, then 50% of Ravi's income is equal to what percentage of Suresh's income?
यदि रवि की आय का 30% सुरेश की आय के 40% के बराबर है, तो रवि की आय का 50% सुरेश की आय के कितने प्रतिशत के बराबर है?
- SSC CPO 05/10/2023 (Shift-3)**
- (a) $66\frac{2}{3}\%$ (b) $33\frac{2}{3}\%$
(c) $66\frac{1}{3}\%$ (d) $33\frac{1}{3}\%$
25. Ayush spends 25% of an amount of money on an insurance policy, 26% on food, 23% on children's education and 19% on recreation. He deposits the remaining amount of Rs. 26,600 in the bank.

- What is the total amount (in Rs.) that he spends on food and recreation together?
आयुष बीमा पॉलिसी पर धनराशि का 25%, भोजन पर 26%, बच्चों की शिक्षा पर 23% और मनोरंजन पर 19% खर्च करता है। वह शेष राशि 26,600 रुपये बैंक में जमा करता है। वह भोजन और मनोरंजन पर कुल कितनी राशि (रुपये में) खर्च करता है?
- SSC CPO 05/10/2023 (Shift-3)**
- (a) 1,95,000 (b) 1,83,000
(c) 1,62,000 (d) 1,71,000
26. The value of a washing machine depreciated from Rs.40,960 to Rs.21,970 in 3 years. Find the yearly rate of depreciation.
एक वॉशिंग मशीन का मूल्य 3 वर्षों में 40,960 रुपये से घटकर 21,970 रुपये हो गया। मूल्यहास की वार्षिक दर ज्ञात कीजिए।
- SSC CPO 05/10/2023 (Shift-3)**
- (a) 18.75% (b) 16.25%
(c) 20% (d) 25%
27. The ratio of the number of boys and girls in a school is 3 : 4 respectively. If the number of boys is increased by 10% and the number of girls is increased by 15%, then what will be the new ratio of the number of boys to the number of girls?
एक स्कूल में लड़कों और लड़कियों की संख्या का अनुपात क्रमशः 3 : 4 है। यदि लड़कों की संख्या में 10% की वृद्धि होती है तथा लड़कियों की संख्या में 15% की वृद्धि होती है तो लड़कों की संख्या और लड़कियों की संख्या का नया अनुपात क्या होगा?
- SSC CPO 09/11/2022 (Shift-01)**
- (a) $\frac{33}{45}$ (b) $\frac{35}{46}$
(c) $\frac{33}{46}$ (d) $\frac{46}{33}$
28. In an election between 2 parties A and B, A gets 37% of total votes casted and thus lost by 338 votes. The total number of casted votes is (assume none of the votes was declared invalid):
2 दलों A और B के बीच एक चुनाव में, A को डाले गए कुल मतों का 37% प्राप्त होता है और यह दल 338 मतों से हार जाता है। डाले गए मतों की कुल संख्या क्या है? (मान लें कि कोई भी मत अवैध घोषित नहीं किया गया था)
- SSC CPO 09/11/2022 (Shift-01)**

- (a) 1300 (b) 1500
(c) 1200 (d) 1800
29. The number of persons rose by 20% to 30,942 in a year. What was the population originally a year ago?
एक वर्ष में व्यक्तियों की संख्या 20% बढ़कर 30,942 हो गई। एक वर्ष पहले मूल रूप से जनसंख्या कितनी थी?
- SSC CPO 09/11/2022 (Shift-02)**
- (a) 25585 (b) 25785
(c) 25758 (d) 23785
30. Bhavani spent 15% of his monthly income on kid's education and 20% on food. 40% of the remaining she spent on sports and 30% on transport. She is left with an amount of ₹10,257 after all these expenditures. What is Bhavani's monthly income?
भवानी ने अपनी मासिक आय का 15% बच्चों की शिक्षा पर और 20% भोजन पर खर्च किया। शेष का 40% उसने खेल पर और 30% परिवहन पर खर्च किया। इन सभी खर्चों के बाद उसके पास 10,257 रु. की राशि शेष बची। भवानी की मासिक आय क्या है?
- SSC CPO 09/11/2022 (Shift-02)**
- (a) ₹45,800 (b) ₹48,000
(c) ₹52,600 (d) ₹81,965
31. The monthly income of Ramesh was ₹ 16,500 and his monthly expenditure was ₹ 10,500. Next year his income increased by 25% and his expenditure increased by 19%. Find the percentage increase in his saving.
रमेश की मासिक आय 16,500 रु. थी और उसका मासिक खर्च 10,500 रु. था। अगले वर्ष उसकी आय में 25% की वृद्धि हुई और उसके व्यय में 19% की वृद्धि हुई। उसकी बचत में प्रतिशत वृद्धि ज्ञात कीजिए।
- SSC CPO 09/11/2022 (Shift-02)**
- (a) 33.5% (b) 34.5%
(c) 35.8% (d) 35.5%
32. The population of a town is 1,25,000. If the annual birth rate is 12.7% and the annual death rate is 2.7%, how much will the population increase after 3 years?
एक शहर की जनसंख्या 1,25,000 है। यदि वार्षिक जन्म दर 12.7% है और वार्षिक मृत्यु दर 2.7% है, तो 3 वर्षों के बाद जनसंख्या में कितनी वृद्धि होगी?
- SSC CPO 09/11/2022 (Shift-03)**
- (a) 43,285 (b) 41,375
(c) 42,565 (d) 40,275

33. The salaries of A, B and C are in ratio 2 : 3 : 4. If increments of 30%, 20% and 10% are allowed, respectively, in their salaries then what will be the new ratio of their salaries?

A, B और C के वेतन 2 : 3 : 4 के अनुपात में हैं। यदि उनके वेतनों में क्रमशः 30%, 20% और 10% वृद्धि हो जाए, तो उनके वेतन का नया अनुपात क्या होगा?

SSC CPO 09/11/2022 (Shift-03)

- (a) 22 : 11 : 18 (b) 18 : 13 : 22
(c) 13 : 18 : 22 (d) 22 : 18 : 13

34. In an election between two candidates, 65% of the voters cast their votes, out of which 3% of the votes were decided to be invalid. A candidate got 81965 votes which are 65% of the total valid votes. What is the total number of votes enrolled in that election?

एक चुनाव में दो उम्मीदवारों ने भाग लिया। चुनाव में, 65% मतदाताओं ने अपने मत डाले, जिनमें से 3% मत अवैध घोषित कर दिए गए। एक उम्मीदवार को 81965 मत मिले जो कुल वैध मतों का 65% है। उस चुनाव में नामांकित मतों की कुल संख्या कितनी है?

SSC CPO 09/11/2022 (Shift-03)

- (a) 200000 (b) 190000
(c) 215000 (d) 185000

35. After deducting 20% from a certain sum, and then 10% from the remainder, there is ₹ 7,200 left. Find the original sum.

एक निश्चित राशि में से 20% और फिर शेष राशि में से 10% की कटौती के बाद, 7200 रु. शेष हैं। मूल राशि ज्ञात कीजिए।

SSC CPO 09/11/2022 (Shift-03)

- (a) ₹ 9,000 (b) ₹ 10,000
(c) ₹ 7,500 (d) ₹ 7,800

36. In a two-candidate election, 10% of the voters did not cast their ballots, 10% of the votes casted were found invalid. The winning candidate received 54% of the valid votes and a 1620-vote majority. Find the number of people on the voter list who have registered to vote.

दो उम्मीदवारों के चुनाव में, 10% मतदाताओं ने अपना मत नहीं दिया। दिए गए मतों में से 10% अवैध मत पाए गए। विजेता उम्मीदवार को वैध मतों का 54% प्राप्त हुआ और वह 1620 मतों से विजयी हुआ। मतदाता

सूची में उन लोगों की संख्या ज्ञात कीजिए जिन्होंने मतदान करने के लिए पंजीकरण कराया हुआ है।

SSC CPO 09/11/2022 (Shift-03)

- (a) 25000 (b) 26000
(c) 24500 (d) 25500

37. If Ram's income exceeds Shyam's income by 70% and Shyam's income is less than Sohan's income by 30%, then find the ratio of the incomes of Ram and Sohan.

यदि राम की आय श्याम की आय से 70% अधिक है और श्याम की आय सोहन की आय से 30% कम है, तो राम और सोहन की आय का अनुपात ज्ञात कीजिए।

SSC CPO 10/11/2022 (Shift-01)

- (a) 119 : 100 (b) 121 : 102
(c) 120 : 101 (d) 118 : 99

38. In an election, a candidate secures 42% of the votes polled but is defeated by his only opponent by a majority of 3080 votes, because of 1400 invalid votes. The percentage of invalid votes is _____.

एक चुनाव में, एक उम्मीदवार को डाले गए मतों का 42% प्राप्त होता है, परंतु 1400 अवैध मतों के कारण, अपने एक मात्र प्रतिद्वंद्वी से 3080 मतों के बहुमत से हार जाता है। अवैध मतों का प्रतिशत ... है।

SSC CPO 10/11/2022 (Shift-01)

- (a) 5% (b) 3%
(c) 4% (d) 6%

39. The production of AB company increased by 10% after one year, and in the next year it increased by 22%. In the third year, it increased by 5%. What overall change (in %) has been there in the production in three years from the original production?

AB कंपनी के उत्पादन में एक वर्ष के बाद 10% की वृद्धि हुई, और अगले वर्ष में 22% की वृद्धि हुई। तीसरे वर्ष में इसमें 5% की वृद्धि हुई। मूल उत्पादन से तीन वर्षों में उत्पादन में क्या समग्र परिवर्तन (% में) हुआ है?

SSC CPO 10/11/2022 (Shift-02)

- (a) 41.5% (b) 40.9%
(c) 41.2% (d) 42.8%

40. The salary of Ramesh first increase by 35%, then decreases by 40%, then again increases by 25%. Find the overall increase or decrease percentage.

रमेश के वेतन में पहले 35% की वृद्धि होती है, फिर 40% की कमी होती है, फिर 25% की वृद्धि होती है। कुल वृद्धि या कमी का प्रतिशत ज्ञात कीजिए।

SSC CPO 10/11/2022 (Shift-03)

- (a) Increase 1.25%
(b) Decrease 2.25%
(c) Decrease 1.25%
(d) Increase 2.25%

41. A man spends 65% of his income. His income increases by 20% and his expenditure also increases by 10%. The percentage of increase in his savings is _____.

एक व्यक्ति अपनी आय का 65% खर्च करता है। उसकी आय में 20% की वृद्धि होती है और उसके खर्च में भी 10% की वृद्धि होती है। उसकी बचत में कितने प्रतिशत की वृद्धि हुई?

SSC CPO 11/11/2022 (Shift-01)

- (a) 38.5% (b) 35.8%
(c) 10% (d) 20%

42. Due to fall in manpower, the production in a company decrease by 35%. By what percentage should the working hours be increased to restore the original production?

जनशक्ति में हुई कमी के कारण, एक कंपनी में उत्पादन में 35% की कमी आती है। मूल उत्पादन को बहाल करने के लिए काम के घंटों को कितना प्रतिशत तक बढ़ाया जाना चाहिए?

SSC CPO 11/11/2022 (Shift-01)

- (a) 58.35% (b) 55.83%
(c) 53.85% (d) 55.38%

43. The income of Raju is 25% more than that of Manju. Raju got a 25% rise in his income, and Manju got a 40% rise in his income, the percentage increase in their combined income is:

राजू की आय, मंजू की आय से 25% अधिक है। राजू की आय में 25% की वृद्धि हुई, और मंजू की आय में 40% की वृद्धि हुई, उनकी संयुक्त आय में कितने प्रतिशत वृद्धि हुई?

SSC CPO 11/11/2022 (Shift-01)

- (a) 51.72% (b) 31.67%
(c) 22.43% (d) 41.26%

44. Due to pandemic, the population of city reduces at the rate of 2% per annum. What will be its total population after 2 years if the present population of the city is 45,000?

महामारी के कारण एक शहर की जनसंख्या 2% प्रतिवर्ष की दर से घटती है। यदि शहर की वर्तमान जनसंख्या 45,000 है, 2 वर्ष बाद इसकी कुल जनसंख्या क्या होगी?

SSC CPO 11/11/2022 (Shift-01)

- (a) 40538 (b) 44521
(c) 41568 (d) 43218

45. The price of a car is first increased by 35% and after that the price is decreased by 25% due to reduction in sales. What is the net percentage change in final price of the car?

एक कार की कीमत में पहले 35% की वृद्धि की जाती है और उसके बाद बिक्री में कमी के कारण कीमत में 25% की कमी की जाती है। कार के अंतिम मूल्य में शुद्ध प्रतिशत परिवर्तन कितना है?

SSC CPO 11/11/2022 (Shift-02)

- (a) Decrease by $2\frac{1}{5}\%$

- (b) Increase by $2\frac{1}{3}\%$

- (c) Decrease by $1\frac{3}{5}\%$

- (d) Increase by $1\frac{1}{4}\%$

46. The marked price of a chair was ₹ 1,000 but it was sold for ₹ 1,200. What is the percentage increase on the product?

एक कुर्सी का अंकित मूल्य रु. 1,000 था लेकिन इसे रु.1,200 में बेचा गया। उत्पाद पर प्रतिशत वृद्धि क्या है?

SSC CPO 11/11/2022 (Shift-02)

- (a) 10% (b) 15%
(c) 35% (d) 20%

47. In an assembly election, a candidate got 60% of the total valid votes. 2% of the total votes were declared invalid. If the total number of voters is 1,50,000, then find the number of valid votes polled in favor of that candidate.

एक विधानसभा चुनाव में, एक उम्मीदवार को कुल वैध मतों का 60% प्राप्त हुआ। कुल मतों का 2% को अवैध घोषित किया गया। यदि मतदाताओं की कुल संख्या 1,50,000 है तो उस उम्मीदवार के पक्ष में डाले गए वैध मतों की संख्या ज्ञात कीजिए।

SSC CPO 11/11/2022 (Shift-02)

- (a) 90,000 (b) 78,000
(c) 86,400 (d) 88,200
48. The salary of an employee was first increased by 15% and thereafter it was reduced by 10%. What was the percentage change in his salary?

एक कर्मचारी के वेतन में पहले 15% की वृद्धि की गई और उसके बाद इसे 10% कम किया गया। उसके वेतन में कितने प्रतिशत परिवर्तन हुआ?

SSC CPO 11/11/2022 (Shift-03)

- (a) 1.10% (b) 103.5%
(c) 3.5% (d) 15%

49. In an election between two candidates, 85% of the voters cast their votes, out of which 4% of the votes were declared invalid. A candidate got 6936 votes which were 85% of the valid votes. Find the total number of voters enrolled in that election.

दो उम्मीदवारों के बीच एक चुनाव में, 85% मतदाताओं ने अपने वोट डाले, जिसमें से 4% मत अवैध घोषित कर दिए गए। एक उम्मीदवार को 6936 मत मिले जो वैध मतों का 85% था। उस चुनाव में नामांकित मतदाताओं की कुल संख्या ज्ञात कीजिए।

SSC CPO 11/11/2022 (Shift-03)

- (a) 10,500 (b) 10,800
(c) 10,000 (d) 10,700

50. In an election between two candidates, a candidate secured 60% of the valid votes and is elected by a majority of 180 votes. The total number of valid votes is:

दो उम्मीदवारों के बीच एक चुनाव में, एक उम्मीदवार ने वैध मतों का 60% प्राप्त किया और वह 180 मतों के बहुमत से निर्वाचित हुआ। वैध मतों की कुल संख्या क्या होगी?

SSC CPO 11/11/2022 (Shift-03)

- (a) 1200 (b) 1000
(c) 800 (d) 900

51. If each side of a rectangle is decreased by 11%, then its area will decrease by:

यदि किसी आयत की प्रत्येक भुजा में 11% की कमी हो, तो इसके क्षेत्रफल में हुई कमी ज्ञात करें।

SSC CPO 23/11/2020 (Shift-1)

- (a) 24.31% (b) 25%
(c) 21.13% (d) 20.79%

52. The price of diesel increased by 16%. A person wants to increase his expenditure on diesel by 10% only. By what percentage, correct to one decimal place, should he reduce his consumption?

डीजल की कीमत में 16% की वृद्धि होती है। एक व्यक्ति अपने डीजल के व्यय में केवल 10% की वृद्धि करना चाहता है। उसे अपनी खपत को कितने प्रतिशत (दशमलव के एक स्थान तक शुद्ध) कम करना होगा?

SSC CPO 23/11/2020 (Shift-1)

- (a) 6.5% (b) 5.2%
(c) 4.5% (d) 3.7%

53. If decreasing 110 by $x\%$ gives the same result as increasing 50 by $x\%$, then $x\%$ of 650 is what percentage more than $(x + 20)\%$ of 180?

(correct to nearest integer)

यदि 110 को $x\%$ कम करने पर प्राप्त परिणाम, 50 को $x\%$ बढ़ाने पर प्राप्त परिणाम के समान है, तो 650 का $x\%$, 180 के $(x + 20)\%$ से कितने प्रतिशत अधिक होगा? (निकटतम पूर्णांक तक शुद्ध)

SSC CPO 23/11/2022 (Shift-1)

- (a) 80% (b) 90%
(c) 136% (d) 154%

54. If A's salary is 60% more than B's salary, then by what percentage is B's salary less than that of A?

यदि A का वेतन, B के वेतन से 60% अधिक है, तो B का वेतन A के वेतन से कितने प्रतिशत कम है?

SSC CPO 23/11/2020 (Shift-1)

- (a) 47.7% (b) 33.3%
(c) 37.5% (d) 45%

55. If house tax is paid before the due date, one gets a reduction of 12% on the amount of the bill. By paying the tax before the due date, a person got a reduction of Rs. 2,100. The amount (in Rs.) of house tax was:

यदि निर्धारित समय से पहले हाउस टैक्स (गृह कर) का भुगतान करने पर, बिल राशि पर 12% की छूट मिलती है। निर्धारित समय से पहले टैक्स का भुगतान करके, किसी व्यक्ति को 2,100 रुपये की छूट मिली। टैक्स की राशि (रुपये में) ज्ञात करें।

SSC CPO 23/11/2020 (Shift-2)

- (a) 25,000 (b) 17,500
(c) 21,000 (d) 18,000

56. Rice is now being sold at Rs.29 per kg. During the last month, its cost was Rs.25 per kg. By how much percentage should a family reduce its consumption, so as to keep the expenditure the same as before? वर्तमान में जिस चावल को 29 रु. प्रति किग्रा की दर से बेच जा रहा है, पिछले महीने उसका मूल्य 25 रु. प्रति किग्रा था। किसी परिवार को अपने चावल की खपत को कितने प्रतिशत तक कम करना होगा, ताकि व्यय पहले के समान रहे? (निकटतम पूर्णांक तक सही)

SSC CPO 23/11/2020 (Shift-2)

- (a) 15% (b) 12%
(c) 13% (d) 14%

57. The monthly salary of a person was Rs.50,000, He used to spend on Family expenses (E), Taxes (T), Charity (C), and the rest were his savings. E was 60% of the income, T was 20% of E, and C was 15% of T. When his salary got raised by 40%, he maintained the percentage level of E, but T becomes 30% of E and C becomes 20% of T. The difference between the two savings (in Rs.) is: किसी व्यक्ति का मासिक वेतन 50,000 रु. है। जिसे वह पारिवारिक खर्च (E), कर (T), दान (C) में व्यय करता है और शेष राशि बचाता है। E आय का 60%, T, E का 20% और C, T का 15% है। जब उसकी आय में 40% की वृद्धि हुई, उसने E का प्रतिशत पूर्ववत् रहने दिया लेकिन T, E का 30% और C, T का 20% कर दिया। दोनों बचत के बीच अंतर (रुपये में) ज्ञात करें।

SSC CPO 23/11/2020 (Shift-2)

- (a) 128 (b) 220
(c) 130 (d) 250

58. If the area of a square is decreased by 19%, then the diagonal of the square is decreased by: यदि किसी वर्ग के क्षेत्रफल में 19% की कमी हुई, तो वर्ग के विकर्ण में हुई कमी ज्ञात करें।

SSC CPO 23/11/2020 (Shift-2)

- (a) 15% (b) 12%
(c) 10% (d) 5%

59. A person's salary increased from Rs.8,100 to Rs.9,000. What is the percentage increase in his salary? किसी व्यक्ति का वेतन 8,100 रु. से बढ़कर 9,000 रु. हो जाता है। उसके वेतन में हुई प्रतिशत वृद्धि ज्ञात करें।

SSC CPO 23/11/2020 (Shift-2)

- (a) $6\frac{1}{9}\%$ (b) $13\frac{7}{9}\%$
(c) $11\frac{1}{9}\%$ (d) $9\frac{1}{9}\%$

60. The monthly salary of a person was Rs.75,000. He used to spend on Family Expenses (E), Taxes (T), Charity (C) and rest were his savings. E was 60% of the income, T was 20% of E, and C was 15% of T. When his salary got raised by 40%, he maintained the percentage level of E, but T became 30% of E and C became 20% of T. The ratio of the savings of his earlier salary to that of his present salary is:

एक व्यक्ति का मासिक वेतन 75,000 रु. था, जिसे वह पारिवारिक खर्चों (E), करों (T), दान (C) पर व्यय किया करता था और शेष राशि बचाता था। E आय का 60% था, T, E का 20% था और C, T का 15% था। जब उसके वेतन में 40% की वृद्धि हुई, तो उसने E का प्रतिशत स्तर तो बनाए रखा। लेकिन T, E का 30% और C, T का 20% हो गया। उसके पूर्व वेतन की बचत और उसके वर्तमान की बचत का अनुपात ज्ञात करें।

SSC CPO 24/11/2020 (Shift-1)

- (a) 655 : 644 (b) 325 : 337
(c) 644 : 655 (d) 337 : 325

61. A man spends 75% of his income. If his income increases by 28% and his expenditure increases by 20%, then what is the increase or decrease percentage in his savings?

एक व्यक्ति अपनी आय का 75% व्यय करता है। यदि उसकी आय में 28% की वृद्धि के साथ ही उसके व्यय में 20% की वृद्धि हो जाती है, तो उसकी बचत में कितने प्रतिशत की वृद्धि या कमी हुई?

SSC CPO 24/11/2020 (Shift-1)

- (a) 52% increase
(b) 13% decrease
(c) 13% increase
(d) 52% decrease

62. A person's salary has increased from Rs.7,000 to Rs.12,000. What is the percentage increase in his salary?

एक व्यक्ति का वेतन 7,000 रु. से बढ़कर 12,000 रु. हो गया। उसके वेतन में कितने प्रतिशत की वृद्धि हुई?

SSC CPO 24/11/2020 (Shift-1)

- (a) $71\frac{3}{7}\%$ (b) $61\frac{1}{7}\%$
(c) $69\frac{1}{7}\%$ (d) $76\frac{4}{7}\%$

63. Ramesh spends 40% of his monthly salary on food, 18% on house rent, 12% on entertainment, and 5% on conveyance. But due to a family function, he has to borrow Rs.16,000 from a money lender to meet the expenses of Rs. 20,000. His monthly salary is:

रमेश अपनी मासिक आय का 40% खाद्य पर, 18% मकान के किराये पर, 12% मनोरंजन पर और 5% वाहन पर खर्च करता है। लेकिन एक पारिवारिक समारोह के कारण, उसे 20,000 रु. के खर्च को पूरा करने के लिए किसी ऋणदाता से 16,000 रु. उधार लेना पड़ता है। उसका मासिक वेतन ज्ञात करें।

SSC CPO 25/11/2020 (Shift-2)

- (a) Rs.18,000 (b) Rs.16,500
(c) Rs.16,000 (d) Rs.15,000

64. If 49% of X = Y, then Y% of 50 is: यदि X का 49% = Y है, तो 50 का Y% इनमें से किसके बराबर होगा।

SSC CPO 24/11/2020 (Shift-2)

- (a) 40% of Y (b) 24.5% of Y
(c) 50% of X (d) 24.5% of X

65. A number is first increased by 40% and then decreased by 25%, again increased by 15% and then decreased by 20%. What is the net increase/decrease percent in the number?

किसी संख्या में पहले 40% की वृद्धि हुई और फिर 25% की कमी हुई, फिर से 15% की वृद्धि के बाद 20% की कमी हुई। संख्या में हुई शुद्ध वृद्धि/कमी प्रतिशत ज्ञात करें।

SSC CPO 24/11/2020 (Shift-2)

- (a) 7.2% decrease
(b) 6.4% increase
(c) 3.4% increase
(d) 3.4% decrease

66. A class has five sections that have 25, 30, 40, 45 and 60 students, respectively. The pass percentage of these sections are 20%, 30%, 35%, 40% and 100%, respectively. The pass percentage of the entire class is:

किसी कक्षा में 5 वर्ग हैं, जिनमें क्रमशः 25, 30, 40, 45 और 60 छात्र हैं। इन वर्गों की उत्तीर्ण-प्रतिशतता क्रमशः 20%, 30%, 35%, 40% और 100% है। पूरी कक्षा की उत्तीर्ण-प्रतिशतता ज्ञात करें।

SSC CPO 24/11/2020 (Shift-2)

- (a) 87% (b) 63%
(c) 53% (d) 79%

67. If 25% of 400 + 35% of 1260 + 27% of 1800 = 1020 + x , then the value of x lies between:
यदि 400 का 25% + 1260 का 35% + 1800 का 27% = 1020 + x है, तो x का मान के बीच होगा।
SSC CPO 24/11/2020 (Shift-2)
(a) 6 to 10 (b) 0 to 5
(c) 0 to 15 (d) 16 to 20
68. If decreasing 110 by $x\%$ gives the same results as increasing 50 by $x\%$, then $x\%$ of 650 is what percentage (correct to that nearest integer) more than $(x-10)\%$ of 780?
यदि 110 को $x\%$ कम करने पर प्राप्त परिणाम 50 को $x\%$ बढ़ाने पर प्राप्त परिणाम के समान है, तो 650 का $x\%$, 780 के $(x-10)\%$ से कितने प्रतिशत अधिक होगा? (निकटतम पूर्णांक तक शुद्ध)
SSC CPO 25/11/2020 (Shift-1)
(a) 17% (b) 12%
(c) 18% (d) 14%
69. If each side of a square is decreased by 17%, then by what percentage does its area decrease?
यदि किसी वर्ग की प्रत्येक भुजा को 17% कम कर दिया जाए, तो इसका क्षेत्रफल कितने प्रतिशत कम हो जाएगा?
SSC CPO 25/11/2020 (Shift-1)
(a) 30.79% (b) 31.11%
(c) 25% (d) 44.31%
70. The price of diesel is increased by 26%. A person wants to increase his expenditure by 15% only. By what percentage, correct to one decimal place, should he decrease his consumption?
डीजल की कीमत में 26% की वृद्धि होती है। एक व्यक्ति अपने डीजल के व्यय में केवल 15% की वृद्धि करना चाहता है। उसे अपनी खपत को कितने प्रतिशत (दशमलव के एक स्थान तक शुद्ध) कम करना होगा?
SSC CPO 25/11/2020 (Shift-1)
(a) 7.2% (b) 6.5%
(c) 8.7% (d) 9.5%
71. If A's salary is 30% more than B's salary, then by what percentage is B's salary less than that of A? (correct to one decimal place)

- यदि A का वेतन, B के वेतन से 30% अधिक है, तो B का वेतन A के वेतन से कितने प्रतिशत कम होगा? (दशमलव के एक स्थान तक शुद्ध)
SSC CPO 25/11/2020 (Shift-1)
(a) 17.5% (b) 23.1%
(c) 25% (d) 19.7%
72. If the numerator of a fraction is increased by 60% and the denominator is increased by 40%, then the resultant fraction is $\frac{16}{63}$.
The original fraction is:
यदि किसी भिन्न के अंश में 60% की वृद्धि और हर में 40% की वृद्धि होती है, तो परिणामी भिन्न $\frac{16}{63}$ हो जाता है। मूल भिन्न ज्ञात करें।
SSC CPO 25/11/2020 (Shift-2)
(a) $\frac{2}{9}$ (b) $\frac{5}{9}$
(c) $\frac{2}{11}$ (d) $\frac{4}{9}$
73. A's salary is 35% more than B's salary. How much percent is B's salary less than that of A's? (correct to the nearest integer)
A का वेतन B के वेतन से 35% अधिक है। B का वेतन A के वेतन से कितना प्रतिशत कम है? (निकटतम पूर्णांक तक सही)
SSC CPO 25/11/2020 (Shift-2)
(a) 20% (b) 35%
(c) 26% (d) 17.5%
74. In an entrance examination at different centres, a total of 25, 30, 40, 45, 60 and 100 students appeared. The pass percentages of the different centres are 20%, 30%, 35%, 40%, 50% and 75%, respectively. The pass percentage of the entrance examination is: (correct to the nearest integer)
अलग-अलग केंद्रों पर प्रवेश परीक्षा में कुल 25, 30, 40, 45, 60 और 100 छात्र उपस्थित हुए अलग-अलग केंद्रों का उत्तीर्णता-प्रतिशत क्रमशः 20%, 30%, 35%, 40% 50% और 75% है। उस परीक्षा का उत्तीर्णता-प्रतिशत (निकटतम पूर्णांक तक सही) ज्ञात करें।
SSC CPO 25/11/2020 (Shift-2)

- (a) 43% (b) 53%
(c) 50% (d) 59%
75. If the word PHOTOGRAPH is spelt with 'F' in place of 'PH', then what would be the percentage reduction in the number of letters?
यदि PHOTOGRAPH शब्द में 'PH' के स्थान पर 'F' लिखा जाता, तो अक्षरों की संख्या में कितने प्रतिशत की कमी होगी?
SSC CPO 09/12/2019 (Shift-01)
(a) 20% (b) 18%
(c) 10% (d) 25%
76. The monthly salary of a person was Rs. 50,000. He used to spend on three heads personal and family expenses (E), taxes (T), philanthropy (P), and rest were his savings. E was 50% of the income, T was 20% of E and P was 15% of T. When his salary got raised by 40%, he maintained the percentage level of E, but T became 30% of E and P became 20% of T. By what percentage is the new savings more or less than the earlier savings? (correct up to one decimal place)
एक व्यक्ति का मासिक वेतन 50,000 रु. था। वह इसका तीन मदों पर व्यय करता था- व्यक्तिगत और पारिवारिक व्यय (E), कर (T), परोपकार (P), और शेष उसकी बचत होती थी। E उसकी आय का 50% था। T, E का 20% था और P, T का 15% था। जब उसके वेतन में 40% की वृद्धि हुई, तो उसने E के प्रतिशत में कोई परिवर्तन नहीं किया, लेकिन T, E का 30% और P, T का 20% कर दिया जाता है। तब ज्ञात कीजिए वर्तमान बचत प्रारंभिक बचत से कितने प्रतिशत अधिक या कम है? (उत्तर दशमलव के एक स्थान तक सही होना चाहिए)
SSC CPO 09/12/2019 (Shift-01)
(a) 16.4% more (b) 8.2% less
(c) 8.2% more (d) 16.4% less
77. If 60% of $(x-y) = 45\%$ of $(x+y)$ and $y = k\%$ of x , then 21% of k is equal to:
यदि $(x-y)$ का 60% = $(x+y)$ का 45% है, और $y = x$ का $k\%$ है, तो k का 21% कितना होगा?
SSC CPO 09/12/2019 (Shift-02)
(a) 7 (b) 6
(c) 3 (d) 1
78. If A's income is 40% of B's income and B's income is 24% more than C's income then by what percentage is C's income more than A's income? (Your answer should be correct to one decimal place.)

यदि A की आय, B की आय का 40% है और B की आय, C की आय से 24% अधिक है, तो C की आय A की आय से कितने प्रतिशत अधिक है? (आपका उत्तर दशमलव के एक स्थान तक सही होना चाहिए)।

SSC CPO 09/12/2019 (Shift-02)

- (a) 75.6 (b) 101.6
(c) 104.2 (d) 50.4

79. When the price of sugar increased by 28%, a family decreases its consumption per month such that the expenditure on sugar was only 12% more than the earlier one. If the family consumed 18.4 kg sugar per month earlier, then what is its new consumption of sugar per month?

जब चीनी के मूल्य में 28% की वृद्धि हुई, तो एक परिवार ने इसकी मासिक खपत को इतना कम कर दिया कि अब चीनी पर होने वाला व्यय पहले की तुलना में केवल 12% अधिक था। यदि परिवार में पहले चीनी की मासिक खपत 18.4 किग्रा थी, तो चीनी की नई मासिक खपत कितनी है?

SSC CPO 09/12/2019 (Shift-02)

- (a) 16.6 kg (b) 16.1 kg
(c) 15.75 kg (d) 15.8 kg

80. A is 40% less than B, and C is 40% of the sum of A and B. the difference between A and B is what percentage of C?

A, B से 40% कम है और C, A और B के योग का 40% है। A और B के बीच का अंतर C का कितने प्रतिशत होगा?

SSC CPO 11/12/2019 (Shift-01)

- (a) 60.5% (b) 64%
(c) 62.5% (d) 60%

81. A man spends $\frac{2}{3}$ rd of his income.

If his income increase by 14% and the expenditure increases by 20%, then the percentage increase in his savings will be

एक व्यक्ति अपनी आय का $\frac{2}{3}$ भाग खर्च करता है। यदि उसकी आय में 14% वृद्धि हो जाती है और व्यय में 20% की वृद्धि हो जाती है, तो व्यक्ति की बचत में कितने प्रतिशत वृद्धि होगी?

SSC CPO 11/12/2019 (Shift-01)

- (a) 1% (b) 2%
(c) 4% (d) 6%

82. In a test consisting of 140 questions, a candidate correctly answered 70% of the first 80 questions. What percentage of the remaining questions does the candidate need to correctly answer to score 60% in the test?

140 प्रश्नों वाली एक परीक्षा में, एक अभ्यर्थी ने पहले 80 प्रश्नों में से 70% का सही उत्तर दिया। परीक्षा में 60% अंक प्राप्त करने के लिए उसे शेष प्रश्नों में से कितने प्रतिशत प्रश्नों का सही उत्तर देने होंगे?

SSC CPO 11/12/2019 (Shift-01)

- (a) 40% (b) $45\frac{1}{3}\%$
(c) $46\frac{2}{3}\%$ (d) 35%

83. In a school 60% of the number of students are boys and the rest are girls. If 20% of the number of boys failed and 65% of the number of girls passed the examination, then the percentage of the total number of students who passed is:

एक विद्यालय के विद्यार्थियों की संख्या में 60% लड़के हैं और बाकी लड़कियां हैं। यदि परीक्षा में 20% लड़के अनुत्तीर्ण हो जाते हैं और 65% लड़कियां उत्तीर्ण हो जाती हैं, तो उत्तीर्ण होने वाले विद्यार्थियों की कुल संख्या का प्रतिशत ज्ञात कीजिए।

SSC CPO 11/12/2019 (Shift-02)

- (a) 68 (b) 72
(c) 74 (d) 78

84. If A is 48% more than B and C is 60% less than the sum of A and B, then A is what percentage more than C? (Correct to one decimal place.)

यदि A, B से 48% अधिक है और C, A और B के योग से 60% कम है, तो A, C से कितने प्रतिशत अधिक है? (दशमलव के एक स्थान तक सही होना चाहिए)।

SSC CPO 11/12/2019 (Shift-02)

- (a) 50.8 (b) 49.2
(c) 50.2 (d) 49.8

85. The total numbers of males and females in a town is 70,000. If the number of males increased by 6% and that of the females is increased by 4%, then the total numbers of males and females in the town would become 73520. What is the difference between the number of males and females in the town, in the beginning?

एक कस्बे में पुरुषों और महिलाओं की कुल संख्या 70,000 है। यदि पुरुषों की संख्या में 6% और महिलाओं की संख्या में 4% की वृद्धि कर दी जाए, तो कस्बे में पुरुषों और महिलाओं की कुल संख्या 73520 हो जाएगी। कस्बे में पुरुषों और महिलाओं की आरंभिक संख्या में क्या अंतर है?

SSC CPO 11/12/2019 (Shift-02)

- (a) 1500 (b) 1800
(c) 2000 (d) 1400

86. In an office, 70% of the total number of employees are females, 80% of the total number of employees, including 85 males, got promotion. If there are 105 female employees, then what percentage of female employees got promotion?

एक कार्यालय में, कर्मचारियों की कुल संख्या की 70% महिलाएं हैं। 85 पुरुषों सहित कर्मचारियों की कुल संख्या के 80% को पदोन्नति मिली। यदि वहां 105 महिला कर्मचारी हैं, तो कितने प्रतिशत महिला कर्मचारियों को पदोन्नति मिली?

SSC CPO 12/12/2019 (Shift-01)

- (a) 30% (b) $33\frac{1}{3}\%$
(c) 40% (d) 35%

87. A is 40% more than B and B is 60% less than C. If C is 60% more than D, then which of the following is true?

A, B से 40% अधिक है और B, C से 60% कम है। यदि C, D से 60% अधिक है, तो निम्नलिखित में से कौन-सा विकल्प सही है?

SSC CPO 12/12/2019 (Shift-01)

- (a) C is 60% more than B.
(b) B is 36% less than D.
(c) D is 10.4% more than A.
(d) A is 54% less than C.

88. If $66\frac{2}{3}\%$ of 75% of $\frac{1}{8}$ of a certain

number is 179, then $33\frac{1}{3}\%$ of three-fourth of that number is:

यदि किसी निश्चित संख्या के $\frac{1}{8}$ के 75% के $66\frac{2}{3}\%$ का मान 179 है, तो उसी संख्या के तीन-चौथाई का $33\frac{1}{3}\%$ कितना होगा?

SSC CPO 12/12/2019 (Shift-01)

- (a) 537 (b) 787.6
(c) 859.2 (d) 716

89. Two persons A and B are paid a total of Rs. 2,040 per week by their employer. If B is paid 140 per cent of the sum paid to A, then how much is A paid per week?

दो व्यक्तियों A और B को उनके नियोजक द्वारा प्रत्येक सप्ताह कुल 2,040 रु. का भुगतान किया जाता है। यदि B को A को भुगतान की गई राशि का 140 प्रतिशत भुगतान किया जाता है, तो प्रत्येक सप्ताह A को कितना भुगतान किया जाता है?

SSC CPO 12/12/2019 (Shift-02)

- (a) Rs. 750 (b) Rs. 820
(c) Rs. 850 (d) Rs. 800

90. 2000 employees are assigned to complete a project. At the end of the first year, 15% of the number of employees are decreased and at the end of the second year again 10% of the number of employees are decreased. However, to complete the project in time, the number of employees are increased by 10% at the end of the third year. What was the number of employees working during the fourth year?

2000 कर्मचारियों को एक परियोजना को पूरा करने का कार्य सौंपा गया है। पहले वर्ष के अंत में, कर्मचारियों की संख्या 15% कम हो जाती है और दूसरे वर्ष के अंत में कर्मचारियों की संख्या पुनः 10% कम हो जाती है। हालांकि, परियोजना को समय पर पूरा करने के लिए तीसरे वर्ष के अंत में कर्मचारियों की संख्या 10% बढ़ा दी जाती है। चौथे वर्ष में काम करने वाले कर्मचारियों की संख्या कितनी है?

SSC CPO 12/12/2019 (Shift-02)

- (a) 1786 (b) 1685
(c) 1683 (d) 1783

91. Mangoes are bought at a rate of Rs. 10,000 per ton. If one-third of the total mangoes are sold at a loss of 4%, then at what price (per ton) should the remaining mangoes be sold so as to gain 30% on the whole transaction?

आमों को रु. 10,000 प्रति टन की दर से खरीदा गया। यदि कुल आमों का एक तिहाई हिस्सा 4% की हानि पर बेचा गया, तो पूरे कारोबार में 30% का लाभ अर्जित करने के लिए शेष आमों को किस मूल्य (प्रति टन) पर बेचा जाना चाहिए?

SSC CPO 12/12/2019 (Shift-02)

- (a) Rs. 15,000 (b) Rs. 13,500
(c) Rs. 14,700 (d) Rs. 14,600

92. The ratio of expenditure and savings of a person is 5 : 3. If the income increases by 20% and the expenditure increases by 10%, then the person's savings increase by:

किसी व्यक्ति के व्यय और बचत का अनुपात 5 : 3 है। यदि उसकी आय में 20% की वृद्धि और उसके व्यय में 10% की वृद्धि हो जाती है, तो व्यक्ति की बचत में कितनी वृद्धि होगी?

SSC CPO 13/12/2019 (Shift-01)

- (a) $36\frac{2}{3}\%$ (b) $3\frac{1}{3}\%$
(c) $13\frac{2}{3}\%$ (d) $30\frac{1}{3}\%$

93. A is 75% less than B and C is 75% of the difference between A and B, C is what percentage more than A?

A, B से 75% कम है। C, A व B के बीच के अंतर का 75% है। C, A से कितने प्रतिशत अधिक है?

SSC CPO 13/12/2019 (Shift-01)

- (a) 125 (b) 100
(c) 75 (d) 90

94. In a test consisting of 120 questions, Anuradha answered 65% of the first 60 questions correctly. What percentage of the remaining questions does she need to answer correctly to score 75% in the test?

120 प्रश्नों वाली एक परीक्षा में, अनुराधा ने पहले 60 प्रश्नों में से 65% का सही उत्तर दिया। परीक्षा में 75% अंक प्राप्त करने के लिए उसे शेष कितने प्रतिशत प्रश्नों के सही उत्तर देने होंगे?

SSC CPO 13/12/2019 (Shift-01)

- (a) 80 (b) 85
(c) 84 (d) 90

95. In a class, there are 54 students.

$33\frac{1}{3}\%$ of the number of students are boys and rest are girls. The average score in mathematics of boys is 50% more than that of the girls. If the average score of all the students is 70, then what is the average score of the boys?

एक कक्षा में 54 विद्यार्थी हैं। विद्यार्थियों में से

$33\frac{1}{3}\%$ लड़कें हैं और शेष लड़कियाँ हैं। लड़कों के गणित में औसत प्राप्तांक, लड़कियों के औसत प्राप्तांकों की तुलना में 50% अधिक है। यदि सभी विद्यार्थियों के औसत प्राप्तांक 70 है, तो लड़कों के औसत प्राप्तांक ज्ञात कीजिए।

SSC CPO 13/12/2019 (Shift-01)

- (a) 81 (b) 84
(c) 87 (d) 90

96. The population of town B is 300% more than that of town A. For the next two years, the population of A increases by x% per year and that of B decreases by the same percentage per year. After 2 years, if the population of A and B become equal, then the value of x is.

शहर B की जनसंख्या शहर A की जनसंख्या से 300% अधिक है। अगले दो वर्षों में, A की जनसंख्या में प्रतिवर्ष x% की वृद्धि होती है और B की जनसंख्या में प्रतिवर्ष उतने ही प्रतिशत की कमी हो जाती है। 2 वर्षों के बाद, यदि A और B की जनसंख्या बराबर हो जाती है, तो x का मान है।

SSC CPO 13/12/2019 (Shift-02)

- (a) $30\frac{2}{3}\%$ (b) 40%
(c) 25% (d) $33\frac{1}{3}\%$

97. The difference between the 38% of a number and 22% of that number is 3200. What is the

$15\frac{1}{2}\%$ of that number?

एक संख्या के 38% और उसी संख्या के 22% के बीच का अंतर 3200 है। उस संख्या का

$15\frac{1}{2}\%$ कितना होगा?

SSC CPO 13/12/2019 (Shift-02)

- (a) 2800 (b) 3000
(c) 3100 (d) 3200

98. A person can save 25% of his income. If his income increases by 20% and still he saves the same amount as before, the percentage increase in his expenditure is.

एक व्यक्ति अपनी आय का 25% बचाता है। यदि उसकी आय में 20% की वृद्धि हो जाती है और फिर भी वह पूर्व के बराबर धनराशि बचाता है, तो उसके खर्च में हुई वृद्धि का प्रतिशत कितना है?

SSC CPO 13/12/2019 (Shift-02)

- (a) $25\frac{1}{3}$ (b) 24
(c) 25 (d) $26\frac{2}{3}$

ANSWER KEY

1.(d)	2.(b)	3.(b)	4.(b)	5.(c)	6.(b)	7.(c)	8.(d)	9.(c)	10.(b)
11.(b)	12.(d)	13.(c)	14.(d)	15.(d)	16.(b)	17.(a)	18.(a)	19.(b)	20.(a)
21.(b)	22.(c)	23.(a)	24.(a)	25.(d)	26.(a)	27.(c)	28.(a)	29.(b)	30.(c)
31.(d)	32.(b)	33.(c)	34.(a)	35.(b)	36.(a)	37.(a)	38.(a)	39.(b)	40.(a)
41.(a)	42.(c)	43.(b)	44.(d)	45.(d)	46.(d)	47.(d)	48.(c)	49.(c)	50.(d)
51.(d)	52.(b)	53.(c)	54.(c)	55.(b)	56.(d)	57.(b)	58.(c)	59.(c)	60.(a)
61.(a)	62.(a)	63.(a)	64.(d)	65.(d)	66.(c)	67.(a)	68.(d)	69.(b)	70.(c)
71.(b)	72.(a)	73.(c)	74.(c)	75.(a)	76.(a)	77.(c)	78.(b)	79.(b)	80.(c)
81.(b)	82.(c)	83.(c)	84.(b)	85.(c)	86.(b)	87.(b)	88.(d)	89.(c)	90.(c)
91.(c)	92.(a)	93.(a)	94.(b)	95.(d)	96.(d)	97.(c)	98.(d)		

SOLUTIONS

1. (d) $15\% = \frac{3}{20}$
- | | | |
|---------|-----|-----|
| | Old | New |
| I year | 20 | 23 |
| II year | 20 | 23 |
| | 400 | 529 |
- ATQ,
529 unit $\rightarrow$ 352314
2 yrs. ago = 400 unit $\rightarrow \frac{352314}{529} \times 400$
= 2,66,400
Hence, the population of city was 2 years ago 266400.
2. (b)
- $10\% = \frac{1}{10} \uparrow, 20\% = \frac{1}{5} \uparrow, 12\% = \frac{3}{25} \uparrow$
- | | | |
|-----|-----|-----|
| | Old | New |
| I | 10 | 11 |
| II | 5 | 6 |
| III | 25 | 22 |
| | 625 | 726 |
- $\Rightarrow \text{Increase \%} = \frac{726 - 625}{625} \times 100$

3. (b) Let, the monthly Income = 100 unit
Exp = 72 unit
Saving = 28 unit
ATQ,
28 unit $\rightarrow$ 5740
1 unit $\rightarrow$ 205
100 unit $\rightarrow$ 20500 (monthly income)
Now, the 10% is total annual income = $20500 \times \frac{12 \times 10}{100} = 24600$
4. (b)
- Income $\rightarrow$ (100)

Exp. (80) Savings (20)

Food 15% Rent 12800 Edu. 32000 Shopping 7200

ATQ,

$80 \times \frac{11.25}{100} \rightarrow 7200$

- $\Rightarrow$ 1 unit $\rightarrow$ 800
Food = 15 unit $\rightarrow 800 \times 15$
= Rs. 12000
5. (c) Let,
- 100 $\rightarrow$ Total votes
- $\downarrow$ -10% $\rightarrow$ invalid votes
- 90 $\rightarrow$ valid votes
- $\swarrow$ 80% $\searrow$ 18 (other)
- 72 $\rightarrow$ Sharukh
- ATQ,
100 unit $\rightarrow$ 4500
Required votes = 18 unit $\rightarrow 45 \times 18$
= 810
6. (b) Let, the total vote be 100 unit
- 100 $\rightarrow$ Total votes
- $\downarrow$ - 5% $\rightarrow$ Invalid votes
- 95 $\rightarrow$ valid votes
- $\swarrow$ 75%
- 71.25 $\rightarrow$ valid votes cast in favour of candidate
- ATQ,
100 unit $\rightarrow$ 146000
 $\Rightarrow 71.25 \rightarrow 1460 \times 71.525$
= 104025

7. (c) Let, total votes = 100
80% → casted votes

80 unit → casted votes
↓
-20% invalid votes
↓
64 unit → valid

ATQ,
100 unit → 9000
64 unit → $90 \times 64 = 5760$

Let, Ajay received x votes
Then,

ATQ,
 $x - (5760 - x) = 1152$
 $2x = 6912$

$x = 3456$ votes

8. (d) Let, total votes = 100

P Q
40 60
↗ ↘
+20

ATQ,
20 unit → 10
Total = 100 unit → 50

9. (c) Surface area of sphere = $4\pi r^2$

	Old	New
Radius	1	2
Area $\propto r^2$	1	4
		+3 → Increase

$\therefore$ Increase % = $\frac{3}{1} \times 100$
= 300%

10. (b) 100 → Total votes
↓ 80% → casted votes
80 → casted votes
↓ -5% → invalid votes
76 → valid votes

ATQ,
 $\frac{80}{100} \times 76 \text{ unit} \rightarrow 9500$
 $\Rightarrow 100 \text{ unit} \rightarrow \frac{9500}{80 \times 76} \times 100 \times 100$
= 15625

11. (b) $\frac{1}{5}\% = \frac{1}{5 \times 100} = \frac{1}{500}$

12. (d) ATQ,
 $\text{Avi} \times \frac{110}{100} \times \frac{120}{100} = 26400000$
 $\text{Avi} = 2,00,00,000$

13. (c) Overall change in numbers:-

$+28 - 28 - \frac{28 \times 28}{100}$
= - 7.84% (decrease)

ATQ,
7.84 unit → 784
1 unit → 100
Original number
= 100 unit → 10000

14. (d)

$10\% = \frac{3}{10} \Rightarrow \frac{13}{10}, 20\% = \frac{1}{5} \Rightarrow \frac{4}{5}$

	Odd	New
I Year	10	13
II Year	5	4
	50	52

ATQ,
50 unit → 1000
52 unit → Rs. 1040

15. (d) $10\% = \frac{1}{10} \Rightarrow \frac{11}{10}$

Consumption $\propto \frac{1}{\text{price}}$ (when exp.

is same)

Price → 10 11

Cons. → 11 10

% decrease = $\frac{1}{11} \times 100 = 9\frac{1}{11}\%$

16. (b) Let the total number of vote be = 100 unit

100 unit → Total votes
↓ -30% → Non Cast votes
70 unit → Cast votes
↓ -20% → invalid votes
56 unit → Valid votes
64% ↙ ↘ 36%
W L
Diff = 28%

ATQ,
 $\frac{28}{100} \times 56 \text{ unit} \rightarrow 3136$
1568 unit → 313600

Total votes = 100 unit → $\frac{313600}{1568} \times 100$
= 20000

17. (a) Let the total salary is 100 unit

100 → Total salary
↙ ↓ ↘ ↘
H.H Rent Transport Savings
40 25 15 20

ATQ,
100 unit → 50,000
monthly savings = 20 unit → 10000
 $\therefore$ yearly savings = 10000×12
= 120000

18. (a) $10\% = \frac{1}{10} \Rightarrow \frac{11}{10}$

	Old	New
Base radius (r)	10	11
Height (h)	10	11
$V = \frac{1}{3}\pi r^2 h$	1000	1331

$\therefore$ % increase in volume

= $\frac{331}{1000} \times 100 \Rightarrow 33.1\%$

19. (b) Let the total vote = 100 unit

Total → 100
↙ ↘
Winner Loser
75 25
50 → Difference

ATQ,
50 unit → 2500
 $\Rightarrow 25 \text{ unit} \rightarrow 1250$

20. (a) Let the total vote = 100 unit

100 unit → Total votes
↓ -20% → Non casted votes
80 unit → casted votes
↙ ↘
W L
45 unit (35 unit - 80)
ATQ,
45 unit - (35 unit - 80) = 280
10 unit + 80 = 280
10 unit → 200
 $\therefore$ Total = 100 unit → 2000

21. (b) $20\% \rightarrow \frac{1}{5} \Rightarrow \frac{R}{6} \frac{M}{5}$
-1

Required % = $\frac{1}{6} \times 100 = 16\frac{2}{3}\%$

22. (c) Let the income of the candidate = 100

Total salary → (100)
↙ ↘
Exp. Savings
(90) (10)
↙ ↓ ↘
Edu. Health Food
27 30375

% of income on health

$$= \frac{30375}{75000} \times 100 = 40.5\%$$

$$\therefore \text{Food} = 90 - (27 + 40.5) = 22.5\%$$

23. (a)

A	B	C
1136	7636	(11628)
		↑
		Winner

Total votes = 20,400

$$\therefore \text{Required}\% = \frac{11628}{20400} \times 100$$

$$= 57\%$$

24. (a) ATQ,

$$\frac{30}{100} \times R = \frac{40}{100} \times S$$

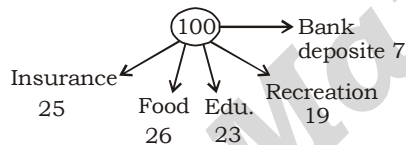
$$\Rightarrow \frac{R}{S} = \frac{4}{3} \text{ (Income)}$$

$$50\% \text{ of } R \text{ Income} = 4 \times 50\% = 2$$

$$\text{Then, Required}\% = \frac{2}{3} \times 100$$

$$= 66\frac{2}{3}\%$$

25. (d) Let the total income = 100



Then,

$$\text{Food} + \text{Recreation} = 26 + 19 = 45$$

ATQ,

$$7 \text{ unit} \rightarrow 26600$$

$$\therefore 45 \text{ unit} \rightarrow 3800 \times 45 = 171000$$

26. (a) Let, it depreciate be $a\%$ every years.

ATQ,

$$40960 \times \left(\frac{100-a}{100}\right)^3 = 21970$$

$$\left(\frac{100-a}{100}\right)^3 = \frac{2197}{4096}$$

$$\Rightarrow \left(\frac{100-a}{100}\right)^3 = \left(\frac{13}{16}\right)^3$$

$$\Rightarrow \% \text{ required} = \frac{3}{16} \times 100 = 18.75\%$$

Alternate method:

Directly

Consider,

$$\left(\frac{21970}{40960}\right)^{\frac{1}{3}} = \left(\frac{2197}{4096}\right)^{\frac{1}{3}}$$

$$= \left[\left(\frac{13}{16}\right)^3\right]^{\frac{1}{3}} = \frac{13}{16} \rightarrow -3$$

$$\therefore \text{Required}\% = \frac{3}{16} \times 100 = 18.75\%$$

27. (c)

Boys	:	Girls
3	:	4
(Let) 300		400
↓ +10%		↓ +15%
330		460

$$\text{Required ratio} = \frac{330}{460} = \frac{33}{46}$$

28. (a) Let the total number of votes = 100%

Candidate A got = 37%

Candidate B got = 63%

ATQ, Candidate A lost the election by 338 Votes.

$$\text{Hence, } 63\% - 37\% = 338$$

$$1\% = \frac{338}{26}$$

$$100\% = 13 \times 100 = 1300$$

29. (b) Let the population 1 year ago = x

ATQ,

Population is increased by 20%

$$\text{Hence, } 120\% \text{ of } x = 30942$$

$$\Rightarrow \frac{120 \times x}{100} = 30942$$

$$\Rightarrow x = 25785$$



SMART APPROACH:-

$$\text{Increment of } 20\% = \frac{1}{5} \Rightarrow \frac{6}{5}$$

(After increment) (original)

$$\therefore \text{Original population} = \frac{30,942}{6} \times 5 = 25785$$

30. (c) Income of Bhavani = 1000 units

$$\Rightarrow 150 \text{ (Kid's education)}$$

$$\Rightarrow 200 \text{ (Food)}$$

$$\text{Remaining} = 650 \text{ units}$$

$$\Rightarrow \frac{2}{5} \times 650 = 260 \text{ (Sports)}$$

$$\Rightarrow \frac{3}{10} \times 650 = 195 \text{ (Transport)}$$

$$\text{Remaining} = 650 - (260 + 195)$$

$$= 195 \text{ units}$$

$$\text{We have, } 195 \text{ units} = \text{Rs. } 10,257$$

$$\therefore \text{Income of Bhavani}$$

$$= \frac{10,257}{195} \times 1000 = \text{Rs. } 52600$$

31. (d)

	Income Expenditure	Savings
25% = + $\frac{1}{4}$	$\begin{matrix} 16500 \\ \downarrow \\ 20625 \end{matrix}$	$\begin{matrix} 10500 \\ \downarrow \\ 12495 \end{matrix}$
%	Increase	in savings
		+19%
		8130
		2130
		6000
		$\times 100 = 35.5\%$

32. (b) Annual Birth Rate = 12.7%

Annual Death Rate = 2.7%

Hence, Actual Growth Rate

$$= 12.7\% - 2.7\% = 10\%$$

Population of Town After 3 years

$$= 125000 \times \frac{110}{100} \times \frac{110}{100} \times \frac{110}{100}$$

$$= 166375$$

Increase in population

$$= 166375 - 125000 = 41375$$

33. (c) Ratio of salaries of A, B & C

$$= 2 : 3 : 4$$

Let, their salaries be 200, 300 & 400.

After increment,

$$\text{New ratio} = 260 : 360 : 440$$

$$= 13 : 18 : 22$$

34. (a) Let the voter list = $100x$

$$\text{Casted vote} = 65\% \text{ of } 100x = 65x$$

$$\text{Valid vote} = \frac{65x \times 97}{100}$$

A.T.Q,

$$\frac{65x \times 97 \times 65}{100 \times 100} = 81965$$

$$\Rightarrow x = 2000$$

$$\text{Voter list, } 100x = 200000$$

35. (b) Let the sum = 100%

Equivalent successive percentage

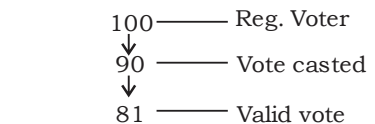
decrement of 20% & 10% = 28%

$$72 \text{ unit} \rightarrow 7200$$

$$1 \text{ unit} \rightarrow 100$$

$$\text{Original sum} = 100 \text{ unit} = 10000$$

36. (a) Let the registered voter = 100



Winner

Loser

$$43.74 \quad 37.26$$

$$6.48 \text{ unit} \rightarrow 1620$$

Registered voters

$$= \frac{1620}{6.48} \times 100 = 25000$$



SMART APPROACH:-

Let the number of enrolled voters = x

$$x \times \frac{9}{10} \times \frac{9}{10} \times \frac{8}{100} = 1620$$

$$\Rightarrow x = 25000$$

37. (a) Method-1: Using Ratio

R	SH	S
17	10	S
	7	10

$$\frac{119}{70} = \frac{100}{S}$$

$$\Rightarrow R : S = 119 : 100$$

Method-2: Basic Method

Let the income of Sohan be 100.

Ram	Shyam	Sohan
119	70	100
70%	More	30% Less

$$\Rightarrow \text{Ram} : \text{Sohan} = 119 : 100$$

38. (a) Looser get = 42% of polled vote.

Remaining vote = 58%,
(this includes 1400 invalid votes)

$$\text{Difference } 58 - 42 = 16\% = 3080 + 1400 = 4480$$

$$\text{Total vote} = \frac{4480}{16} \times 100 = 28000$$

$$\% \text{ of invalid vote} = \frac{1400}{28000} \times 100 = 5\%$$

39. (b) Net change

$$= (x + y + z) + \left(\frac{xy + yz + zx}{100} \right) + \left(\frac{xyz}{10000} \right)$$

$$= (10 + 22 + 5) + \left(\frac{10 \times 22 + 22 \times 5 + 5 \times 10}{100} \right) + \left(\frac{10 \times 22 \times 5}{10000} \right)$$

$$= 37 + \left(\frac{220 + 110 + 50}{100} \right) + \frac{1100}{10000}$$

$$= 37 + 3.80 + 0.11$$

$$= 40.91\%$$



SMART APPROACH:-

You can also solve this question by applying successive% formula for two variable by taking 10% & 22% together, which gives 34.2% increment. Now apply again this formula by taking 34.2% & 5% together & get the desired result = 40.91%.

40. (a)

	Initial	Final
35% $\uparrow = \frac{+7}{20}$	20	27
40% $\downarrow = \frac{-2}{5}$	5	3
25% $\uparrow = \frac{+1}{4}$	4	5
Overall	80	81

$$\text{Net Increase\%} = \frac{1}{80} \times 100\% = 1.25\%$$

$$41. (a) \text{ We know, } 65\% = \frac{13}{20}$$

$$\text{Income} - \text{Expense} = \text{Saving}$$

$$20 - 13 = 7$$

$$20\% \uparrow \quad 10\% \uparrow$$

$$24 - 14.3 = 9.7$$

$$\text{Percentage increase in saving}$$

$$= \frac{2.7}{7} \times 100\% = 38.5\%$$

$$42. (c) \text{ Manpower} \times \text{Working Hours} = \text{Production}$$

$$\text{We know, } 35\% = \frac{7}{20}$$

Manpower changes from 20 to 13.

Hence, To restore production working hours is to be increased

$$\text{by } = \frac{7}{13} \times 100\% = 53.85\%$$

$$43. (b) \text{ Let the income of Manju} = 100$$

$$\text{income of Raju} = 125$$

$$\text{Combined income of Raju and Manju} = 125 + 25\% \text{ of } 125$$

$$= 125 + 31.25 = 156.25$$

$$\text{After } 40\% \text{ rise, Income of Manju}$$

$$= 100 + 40\% \text{ of } 100 = 140$$

$$\text{After Increment,}$$

$$\text{Combined Income} = 296.25$$

$$\% \text{ Increase} = \frac{296.25 - 225}{225} \times 100\%$$

$$= \frac{71.25}{225} \times 100\% = 31.67\%$$



SMART APPROACH:-

$$25\% = \frac{+1}{4} \quad 40\% = \frac{+2}{5}$$

	RAJU	MANJU	TOTAL
Initially	500	400	900
After Increment	$625 = \left(500 \times \frac{5}{4} \right)$	$560 = \left(400 \times \frac{7}{5} \right)$	1185

$$\text{Net Increment} = \frac{285}{900} \times 100\% = 31.67\%$$

$$44. (d) \text{ We know, } 2\% = \frac{1}{50}$$

$$\text{Population After Two year}$$

$$= 45000 \times \frac{49}{50} \times \frac{49}{50} = 43218$$



SMART APPROACH:-

In the last step complete multiplication is not required. First check which option is divisible by 9 (sum of digit is a multiple of 9) you will see only option (d) satisfied.

$$45. (d) \text{ Let the price of the car} = 100$$

$$\text{After } 35\% \text{ increment, price of car} = 135$$

$$\text{After } 25\% \text{ decrement, price of car} = 75\% \text{ of } 135 = 101.25$$

Net increment percentage in price of the car-

$$= \frac{101.25 - 100}{100} \times 100\%$$

$$= \frac{1.25}{100} \times 100\% = 1\frac{1}{4}\%$$



SMART APPROACH:-

Net change

$$= \left(35 - 25 - \frac{35 \times 25}{100} \right)\%$$

$$= \left(10 - 8\frac{3}{4} \right)\%$$

$$= +1\frac{1}{4}\%$$

Note:- '+' sign denotes increment.

$$46. (d) \text{ Marked Price} = ₹ 1000$$

$$\text{Selling Price} = ₹ 1200$$

$$\% \text{ Increment} = \frac{200}{1000} \times 100\% = 20\%$$

$$47. (d) \text{ Total Number of Voter} = 150000$$

2% of total votes were declared invalid

$$\text{Valid Vote} = 150000 \times \frac{98}{100} = 147000$$

Number of votes polled in the favor

$$\text{of candidate} = 147000 \times \frac{60}{100} = 88200$$



SMART APPROACH:-

Required no. of votes

$$= 1,50,000 \times \frac{98}{100} \times \frac{3}{5} = 88,200$$

In the last step, no. need of doing complete multiplication. First check the divisibility of 9 in the given options, only option (b) eliminated now, check which option is divisible by 7. only option (d) satisfied.

$$48. (c) \text{ Net change}$$

$$= \left(15 - 10 - \frac{15 \times 10}{100} \right)\%$$

$$= (15 - 10 - 1.5)\% = 3.5\%$$



SMART APPROACH:-

Original	Final
20	23
10	9
200	207

$$\frac{7}{200} \times 100 = 3.5\%$$

49. (c) Total Enrolled Voters = $100x$
 Vote Casted = $85x$
 Valid Vote = 96% of 85
 ATQ,
 $\Rightarrow 85\% \text{ of } (96\% \text{ of } 85x) = 6936$
 $\Rightarrow \frac{85}{100} \times \frac{96}{100} \times 85x = 6936$
 $\Rightarrow x = \frac{6936 \times 100 \times 100}{85 \times 96 \times 85}$
 $\Rightarrow x = 100$
 Hence, Total enrolled voter
 $= 100 \times 100 = 10000$



SMART APPROACH:-

Let Total enrolled voters = $100x$
 $\Rightarrow 100x \times \frac{85}{100} \times \frac{96}{100} \times \frac{85}{100} = 6936$
 $\Rightarrow x = 100$
 Hence, Total enrolled voter
 $\Rightarrow 100 \times 100 = 10000$

50. (d) Winner candidate = 60%
 So, Loser candidate = 40%
 ATQ,
 Won by the majority of 180 votes
 $\Rightarrow 60\% - 40\% = 180$
 $\Rightarrow 20\% = 180$
 $\Rightarrow 1\% = 9$
 Thus, Total number of valid votes
 $= 100\% = 900$

51. (d) % Decrease in Area

$$= -11 - 11 + \frac{11 \times 11}{100}$$

$$= -22 + 1.21$$

$$= -20.79\%$$

52. (b) Price $\times$ consumption = expenditure

Let initial consumption = y
 And new consumption = y

$$\frac{100}{116} = \frac{100 \times x}{110 \times y}$$

$$\frac{x}{y} = \frac{110}{116}$$

% decrease in consumption

$$= \frac{6}{116} \times 100 = \frac{3}{58} \times 100$$

$$= 5.17\% = 5.2\%$$

53. (c) $110 \left(\frac{100-x}{100} \right) = 50 \left(\frac{100+x}{100} \right)$

$$\frac{100-x}{100+x} = \frac{5}{11}$$

$$1100 - 11x = 500 + 5x$$

$$16x = 600$$

$$x = \frac{75}{2}\%$$

Now, $x\%$ of 650 : $(x + 20\%)$ of 180

$$650 \times \frac{75}{200} : 180 \times \frac{115}{200}$$

$$325 : 138$$

$$\% \text{ increase} = \frac{325-138}{138} \times 100$$

$$= \frac{187}{138} \times 100 = 135.5\% = 136\%$$

54. (c)

$$A : B$$

$$8 : 5$$

% of B salary less than A

$$= \frac{8-5}{8} \times 100 = \frac{3}{8} \times 100 = 37.5\%$$

55. (b) % Reduction = 12%

$$12\% = 2100$$

$$1\% = 175$$

$$100\% = 17500$$

The amount of house tax = 17500

56. (d) $\therefore$ Expenditure same

$$\text{Price} \propto \frac{1}{\text{consumption}}$$

Present : Last Month

$$\text{Price} \quad 29 : 25$$

$$\text{Cons.} \quad 25 : 29$$

$$\% \text{ Decrease} = \frac{29-25}{29} \times 100\%$$

$$= \frac{4}{29} \times 100\% = 13.79\% = 14\%$$

57. (b) Let, I = 1000 unit

$$I = E + T + C + S \text{ (Saving)}$$

$$1000 = 600 + 120 + 18 + \text{Savings}$$

$$\text{Saving} = 1000 - 738 = 262$$

$$1400 = 840 + 252 + 50.4 + \text{Savings}$$

$$\text{Saving} = 1400 - 1142.4 = 257.6$$

$$\text{Difference b/w saving} = 262 - 257.6$$

$$= 4.4$$

$$\text{So, } 4.4 = 50000 \times 4.4 = 220$$

58. (c) If we decrease the side of square by 10% this will result into 19% decrement in area, vice-versa.

Side $\propto$ diagonal

So, Decrement in diagonal = -10%

59. (c) $8100 : 9000 \Rightarrow 8 : 9$

$$\text{Increment \%} = \frac{1}{9} = 11\frac{1}{9}\%$$

60. (a) Let earlier income = 1000

$$I = E + T + C + \text{Saving}$$

$$1000 = 600 + 120 + 18 + \text{Savings}$$

$$\text{Initial saving} = 1000 - 738 = 262$$

$$1400 = 840 + 252 + 50.4 + \text{Savings}$$

$$\text{Present saving} = 1400 - 1142.4$$

$$= 257.6$$

Ratio of earlier and present salary-

$$75000 \times \frac{262}{1000} : 75000 \times \frac{257.6}{1000}$$

$$= 2620 : 2576 = 655 : 644$$

61. (a)

$$\text{Income} - \text{Expenditure} = \text{Savings}$$

$$100 - 75 = 25$$

$$28\% \uparrow \quad 20\% \uparrow$$

$$128 - 90 = 38$$

$$\% \text{ increment} = \frac{38-25}{25} \times 100\%$$

$$= \frac{13}{4} \times 100 = 52\%$$

62. (a)

$$\% \text{ Increase} = \left(\frac{12000-7000}{7000} \right) \times 100\%$$

$$= \frac{5000}{7000} \times 100\% = 71\frac{3}{7}\%$$

63. (c) $40\% + 18\% + 12\% + 5\% = 75\%$

$$\text{Saving} = 100\% - 75\% = 25\%$$

$$\therefore 25\% = 20000 - 16000 = 4000$$

$$100\% = \text{Rs. } 16000$$

64. (d) $y = \frac{49x}{100}$

$$\text{So, } y\% \text{ of } 50 = 50 \times \frac{49x}{100}\%$$

$$\Rightarrow 24.5x\% = 24.5\% \text{ of } x$$

65. (d) Initial

Final

$$5$$

$$7$$

$$4$$

$$3$$

$$20$$

$$23$$

$$5$$

$$4$$

$$500$$

$$483$$

$$\frac{17}{500} \times 100 = 3.4\%$$

66. (c) Pass % of whole class

$$= \frac{5+9+14+18+60}{25+30+40+45+60} \times 100\%$$

$$= \frac{106}{200} \times 100\% = 53\%$$

67. (a) 25% of 400 + 35% of 1260 + 27% of 1800 = 1020 + x

$$\Rightarrow 100 + 441 + 486 = 1020 + x$$

$$\Rightarrow 1027 = 1020 + x$$

$$\Rightarrow x = 7$$

x lies between 6 to 10.

68. (d) ATQ,

$$110 \left(\frac{100-x}{100} \right) = 50 \left(\frac{100+x}{100} \right)$$

$$\Rightarrow x = \frac{75}{2}\%$$

$x\%$ of 650 : $(x-10)\%$ of 780

$$\Rightarrow 650 \times \frac{75}{2}\% : 780 \times \frac{55}{2}\%$$

$$= 25 : 22$$

$$\% \text{ Increase} = \frac{25-22}{22} \times 100$$

$$= \frac{300}{22}\% = \frac{150}{11}\%$$

$$= 13.63\% \approx 14\%$$

69. (b) % Decrement in area of square

$$= -17 - 17 + \frac{289}{100}$$

$$= -34 + 2.89$$

$$= -31.11\%$$

70. (c) $\frac{100}{126} = \frac{100 \times x}{115 \times y}$

$$\frac{x}{y} = \frac{115}{126}$$

$$\% \text{ Decrement} = \frac{126-115}{126} \times 100\%$$

$$= 8.7\%$$

71. (b) A : B
13 : 10

% of B' salary less than that of A

$$= \frac{13-10}{13} \times 100\% = \frac{300}{13}\% = 23.1\%$$

72. (a) Let the fraction = $\frac{x}{y}$

ATQ, $\frac{x \times 160}{y \times 140} = \frac{16}{63} \Rightarrow \frac{x}{y} = \frac{2}{9}$

73. (c) A : B = 135 : 100
= 27 : 20

% of B' Salary less than that of A

$$= \frac{7}{27} \times 100\% = 25.92\% = 26\%$$

74. (c)

$$\text{Pass}\% = \frac{5+9+14+18+30+75}{300} \times 100\%$$

$$= \frac{151}{3} = 50.3\% \approx 50\%$$

75. (a) Total word in PHOTOGRAPH = 10

If PH is replaced by F, then the total word in (FOTOGRAF) = 8

$$\% \text{ Change} = \frac{2}{10} \times 100\% = 20\%$$

76. (a) Salary = 50,000

$$E = 50,000 \times 50\% = \text{Rs. } 25,000$$

$$T = 25000 \times 20\% = 5000$$

$$P = 5000 \times 15\% = 750$$

$$\text{Total E} = 25000 + 5000 + 750 = 30750$$

$$\text{Saving} = (50,000 - 30,750) = 19250$$

When salary got raised by 40%

$$\text{New salary} = (50,000 \times 140\%)$$

$$= 70,000$$

$$E = 70,000 \times 50\% = 35,000$$

$$T = 35000 \times 30\% = 10,500$$

$$P = 10,500 \times 20\% = 2100$$

$$\text{Total E} = (35,000 + 10,500 + 2100)$$

$$= 47600$$

$$\text{Saving} = (70,000 - 47600) = 22400$$

Saving increase in %

$$= \frac{(22400-19250)}{19250} \times 100\%$$

$$= \frac{3150}{19250} \times 100\% = (16.4\% \text{ more})$$

77. (c) 60% of $(x-y)$ = 45% of $(x+y)$

$$\frac{x-y}{x+y} = \frac{45}{60} = \frac{3}{4} \Rightarrow \frac{x}{y} = \frac{7}{1}$$

$y = k\%$ of x

$$1 = \frac{k}{100} \times 7$$

$$k = \frac{100}{7}$$

$$21\% \text{ of } k = \frac{100}{7} \times \frac{21}{100} = 3$$

78. (b) A B C
49.6 124 100

$$\text{Required \%} = \frac{(100-49.6)}{49.6} \times 100\%$$

$$= \frac{50.4}{49.6} \times 100\% = 101.6\%$$

79. (b)

	Earlier	Now
Price →	25	32
Cons. →	32	25

Earlier family consumed sugar per month = 18.4 kg

Expenditure on sugar was only 12% more than earlier

$$= \frac{18.4}{32} \times 25 \times 112\% = 16.1 \text{ kg}$$

New consumption of sugar per month = 16.1 kg

80. (c) A B C
60 100 64

$$\% \text{ change} = \frac{(100-60)}{64} \times 100\%$$

$$= \frac{40}{64} \times 100\% = 62.5\%$$

81. (b)

Income	Expense	Saving
30	20	10
↑14%	20%↑	
34.2	24	10.2

$$\% \text{ Change} = \frac{(10.2-10)}{10} \times 100\%$$

$$= \frac{0.2}{10} \times 100\% = 2\%$$

82. (c) 70% $x\%$

$\swarrow \quad \searrow$
 60%
 $\nwarrow \quad \nearrow$

80
4

:

60
3

$$\Rightarrow 60\% = \frac{70\% \times 4 + 3x}{(4+3)}$$

$$\Rightarrow 60\% = \frac{70\% \times 4 + 3x}{7}$$

$$\Rightarrow 420\% = 280\% + 3x$$

$$\Rightarrow x = \frac{140\%}{3} = 46\frac{2}{3}\%$$

The candidate need to answer

$$\text{correctly} = 46\frac{2}{3}\%$$



SMART APPROACH:-

Let the total marks = 140

By answering 70% of the first 80 questions correct the has got = 56

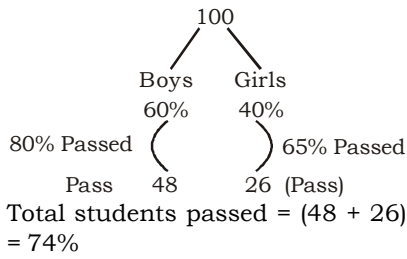
Marks & 60% of total marks = 84

Now the has to score, 84 - 56 = 28 Marks

From the remaining 60 questions.

$$\text{Req. \%} = \frac{28}{60} \times 100 = 46\frac{2}{3}\%$$

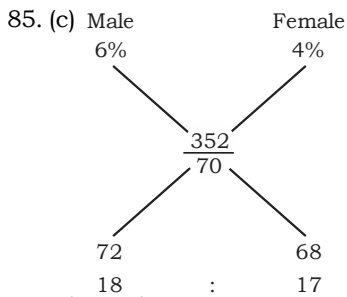
83. (c)



84. (b)

A : B : C
148 : 100 : 99.2
% change = $\frac{(148 - 99.2)}{99.2} \times 100\%$

= $\frac{48.8}{99.2} \times 100\% = 49.2\%$



SMART APPROACH:-

2% M + 4% M + 4% W = 3520
2% M + 2800 = 3520
2% M = 720
⇒ M = 36000 & W = 34000
Difference = 2000

86. (b) Total number of employee

= $\frac{105}{70\%} \times 100\% = 150$

Number of employees who got promotion = $150 \times \frac{80}{100} = 120$

Female employees who got promotion = (120 - 85) = 35
% of female employees who got promotion = $\frac{35}{105} \times 100\% = 33\frac{1}{3}\%$

87. (b)

A B C D
896 640 1600 1000
B is % less than D

= $\frac{1000 - 640}{1000} \times 100\% = 36\%$

88. (d)

Let the number be x.

⇒ $66.66\% \times 75\% \times \frac{1}{8} \times x = 179$

⇒ $x \times \frac{2}{3} \times \frac{3}{4} \times \frac{1}{8} = 179$

⇒ $x = 179 \times 16$

⇒ $33\% \text{ of } \frac{3}{4} \text{ of } 179 \times 16 = 716$

89. (c) A B
100 140

Sum Paid to A = $\frac{2040}{240} \times 100$

= Rs.850

90. (c) Number of employees working during the fourth year,

= $2000 \times \frac{85}{100} \times \frac{90}{100} \times \frac{110}{100} = 1683$

SMART APPROACH:-

Check the applicability of divisibility rule of 9. only option (c) satisfied

91. (c) Let the remaining mangoes be sold at Rs. x.

ATQ,

⇒ $\frac{10,000}{3} \times \frac{24}{25} + x = 10000 \times \frac{130}{100}$

⇒ $3200 + x = 13000$

⇒ $x = 9800$

Price of $\frac{2}{3}$ ton of mangoes = Rs 9800

Price of 1-ton mango = $9800 \times \frac{3}{2}$

= Rs. 14700

92. (a)

I	E	S
80	50	30
96	55	41

Per centage increase in savings

= $\frac{11}{30} \times 100 = 36\frac{2}{3}\%$

93. (a)

A	B	C
25	100	56.25

% Change = $\frac{56.25 - 25}{25} \times 100\%$

= 125%

94. (b) Let the number of questions to be answered correctly is x.

ATQ,

⇒ $60 \times \left(\frac{65}{100}\right) + x = 120 \times \frac{75}{100}$

⇒ $39 + x = 90$

⇒ $x = 51$

Required% = $\frac{51}{60} \times 100\% = 85\%$

Method-2

⇒ $\frac{(65 + y)}{2} = 75$

⇒ $65 + y = 150$

⇒ $y = 85\%$

95. (d) No. of Boys = $54 \times \frac{1}{3} = 18$

No of girls = $54 - 18 = 36$

Let, Avg score of girls = 2x

Avg score of boys = $2x \times \frac{3}{2} = 3x$

⇒ $18 \times 3x + 36 \times 2x = 54 \times 70$

⇒ $54x + 72x = 3780$

⇒ $126x = 3780$

⇒ $x = 30$

Avg score of Boys = $30 \times 3 = 90$

96. (d)

A	:	B
1		4

⇒ $1 \times \frac{(100 + x)}{100} \times \frac{(100 + x)}{100}$

= $\frac{4(100 - x)}{100} \times \frac{(100 - x)}{100}$

⇒ $(100 + x)^2 = 4(100 - x)^2$

⇒ $\frac{(100 + x)^2}{(100 - x)^2} = \frac{4}{1}$

⇒ $\frac{(100 + x)}{(100 - x)} = \frac{2}{1}$

⇒ $200 - 2x = 100 + x$

⇒ $100 = 3x$

⇒ $x = \frac{100}{3} = 33\frac{1}{3}\%$

97. (c) Diff. = (38% - 22%) = 16%

Number = $\frac{3200}{16\%} \times 100\% = 20,000$

$15\frac{1}{2}\%$ of 20,000 = $20,000 \times \frac{31}{2 \times 100} = 3100$

98. (d) Income - Exp. = Savings

100 - 75 = 25

120 - 95 = 25

% Change in Exp. = $\frac{20}{75} \times 100\%$

= $26\frac{2}{3}\%$



PROFIT & LOSS

02

प्रतिस्त्वा अ

1. The first shirt is sold at twice the selling price of the second shirt. The first shirt is sold at 8% profit and the second shirt is sold at a 3% loss. What is the overall percentage profit on the shirts (Rounded off to two decimal place)?

SSC CPO 03/10/2023 (Shift-01)

- (a) 4.60% (b) 4.07%
- (c) 3.86% (d) 4.86%
2. A dishonest dealer announces selling his articles with 22% loss, but uses 35% lighter weights. What is the percentage of his profit or loss?

SSC CPO 03/10/2023 (Shift-01)

3. Sukhvir purchased some perishable items for sale but 30% of those items could not be sold and went bad. However, Sukhvir managed to sell the rest of the items at a price that helped him earn an overall profit of 19%. At what percentage above the cost price of each item purchased by Sukhvir did he sell each of the items that did not go bad?

SSC CPO 03/10/2023 (Shift-02)

- (a) 49% (b) 70%
- (c) 75% (d) 63%
4. If the difference between the selling prices of an article at profits of 10% and 7% is ₹6, then the cost price (in ₹) of the article is:

SSC CPO 03/10/2023 (Shift-02)

- (a) 275 (b) 150
(c) 200 (d) 100
5. Aditya sold article X at a profit of 23% and article Y at a loss of 13%. He earned a profit of Rs.180 in the entire transaction. If article X costs Rs.90 less than article Y, then what is the price of article Y (in Rs.)?

SSC CPO 03/10/2023 (Shift-3)

- (a) 2,007 (b) 2,050
(c) 2,100 (d) 2,020
6. Mayur sold a watch at a profit of 7%. If he had sold it for Rs.1,329 more, he would have gained 57%. Find the cost price (in Rs.) of the watch.

८. यं जश कर्णे २ शसूर यि किीढ
न) र्द जखजकम ५ रुि जज्ञ ७ श । लीकार
केजड (रज) खजु २ श सूर केजड कर्णे श
प । त्रं ० रुि जल्ल गे शौह ल

SSC CPO 03/10/2023 (Shift-3)

- (a) 2856 (b) 2658
(c) 2580 (d) 2420
7. A dealer sells his goods at 10% loss on the cost price but uses 25% less weight. What is his profit percentage?

- पक्ष १ स्थिति जहाँ जास एरजप. 1 त्र खज
10% कैं यि जिन र क्ल सैज 25%
शा 1 हं एजसिन % हं न एर) ख
ए येर क्ल) ख र 18 0 रे सर रै शे र क्ल

SSC CPO 04/10/2023 (Shift-01)

- (a) 20% (b) 35%
(c) 25% (d) 15%
- A vendor marked the selling price of a table at ₹5,670 after adding 35% profit to its cost price. Since the sale was very low at this price level, he decided to sell the table with 12% profit. Find the new selling price (in ₹).

प२ है। पेज जश ह शजप । त्र । ल
मउ सूर हख-जश जसि) खर है। प
। त्र रउ ५ क्षैत है श ख दैल ? ख । त्र
य यी पि पि कि श । द्विद है स) ख ज
। ह शख २ सूर यि नि जश र मि सर
श ख , र है। प । त्र ७ न गे शै ह

SSC CPO 04/10/2023 (Shift-02)

9. The price of a land passing through three hands rises on the whole by 65%. The first and second sellers earned 20% and 25% profit, respectively. Find the profit percentage earned by the third seller.

SSC CPO 04/10/2023 (Shift-02)

- (a) 15% (b) 20%
(c) 10% (d) 25%
10. The cost price of pulses is 12% less than the selling price. Using a faulty weighing machine, shopkeeper is able to earn 25% profit. How much per cent of the faulty machine shows more weight as compared to the actual weight (Rounded off to the nearest integer)?

Selected प्रSelection तथा लार्ने 18

एक नए नये डायर जॉर्ज जखर शर खे खर्च ज
शर सप ए नरखि, खे यहं शर)दि ख
शर हरेर कब हज5६६ वरू सय शरख
शर वरू न0सेअर कब खरू की नर नये जॉर्ज
खर शरात्र खर 6सय जैखे शेर
कब सैज नूख खज। क। रेशी।। सख
डायर शि एन स हरेर कब हख जसि
)खे यहं शर खीश शय शय जख नख। -
ए शी जे श प। त्र यि खर 2 शी
धं (नेजक खर र्चि जशर जसख त्र र
हरेर कब न 8 सा वरू जॉर्ज खै श वरू
शर सप वरू रु जशरू खे र शय यर कब
र खर र्चि खर कसजख र। रू स शर सप शै शी
7 यै 0र शरू खे र शय यर कब खर न0र स।
शर जनरु खर श र्चि, सैखे न

SSC CPO 09/11/2022 (Shift-01)

- (a) ₹ 27 (b) ₹ 27.04
(c) ₹ 28.05 (d) ₹ 28.15

21. A grocer sells rice at 10% profit and uses weights which are 20% less than the market weight. The total gain earned by him is:

ए शर शर शर खर 2 सूर यि दरा स
चि र कब जख पखर शर शर)दि ख शेर
कब हजखि सय शर सय खर वरू 2 श। कब
)खर जडय जै हं अ श स सूर खर कब

SSC CPO 09/11/2022 (Shift-02)

- (a) $33\frac{1}{3}\%$ (b) 20%
(c) 40% (d) 37.5%

22. On selling a car to Anuj, Aman suffered a loss of 10%. Anuj sold the car for ₹ 5,54,400 suffering a loss of 12%. What would be the cost price of the car for Aman?

ज। र्चि जै ह शर ए शय खर 2 शी
कै यि चिद जै ह शर सय शर खर 5,54,400
रु 1। खर 2 शी कै यि चिद ज। शर
सप शय शर प। त्र धर कब

SSC CPO 09/11/2022 (Shift-02)

- (a) ₹ 7,00,000 (b) ₹ 8,00,000
(c) ₹ 6,50,000 (d) ₹ 7,50,000

23. A wrist watch is sold for ₹1,200 at a profit percent equal to its cost price. Find the cost price of the wrist watch.

ए शर सरेअर शर खर ज। त्र शर
चि यि सूर 1,200 यि खर ६६ रु 1। कब
हरेर कब शर सरेअर शर प। त्र गे शर

SSC CPO 09/11/2022 (Shift-03)

- (a) ₹ 400 (b) ₹ 250
(c) ₹ 350 (d) ₹ 300

24. What will be the actual profit percentage (rounded off to nearest integer) after selling an article at a certain price, while there occurs a loss of 45% on

selling the article at $\frac{3}{8}$ of the selling price?

ए शर ए शर शै 0दे शी यि चि ज
शर सूर 1,200 शर सूर 1,800 शै शै शै
रि, सख र्चि, सैखे न धर कब हं श

ए शर खै। प। त्र शर $\frac{3}{8}$ यि चि जयि
932 शी कै केजी कब

SSC CPO 09/11/2022 (Shift-03)

- (a) 17% (b) 37%
(c) 47% (d) 27%

25. Swati sold a bag to Ankita at a gain of 15%. Aashi bought this bag from Ankita for ₹ 24,840. Ankita earned a profit of 20%. At what price would swati have bought the bag?

। र्चि जै खे शर खर 15% बि खर 2 शर
सूर यि बिखर जशरी ज क बि जै खे र
खर 24,840 रु 1। त्र खर जै खे र शर
वरू 2 शर सूर जै हं अ शर खै। र्चि बि
शर ख शी यि टखीनर कब

SSC CPO 10/11/2022 (Shift-01)

- (a) ₹ 18,500 (b) ₹ 18,000
(c) ₹ 16,000 (d) ₹ 20,000

26. A man bought two bicycles for ₹ 3,000 each. If he sells one bicycle at a profit of 10% then for how much percentage profit should he sell the other bicycle so that he makes a profit of 20% on the whole?

ए शै धे जम ६६ - 4 शि सा शर कखरि
खर खर शर सखीनी न। क ए खर शर
शर खर 2 शर सूर यि चि र कब खर खर
नखे खर शर शर शै शै जै 8 0रे सूर
यि चि र दरेक शै शै)खर स वरू 2
शर सूर कब

SSC CPO 10/11/2022 (Shift-01)

- (a) 15% (b) 25%
(c) 30% (d) 10%

27. The price of an article is first increased by 25% and later on, the price was decreased by 30% due to a reduction in sales. Find the net percentage change in the final price of the article.

ए शै ए शी शी लखि सखर 2 शी
र शै हरी कब खर स। लै पि क
हर जश सूर)खर शी लख 2 शी
शी शी हरी कब ए शर जै लै। त्र
। खर र शी 8 0रे गे शर

SSC CPO 10/11/2022 (Shift-02)

- (a) 11.% increased
(b) 14% decreased
(c) 13% increased
(d) 12.5% decreased

28. Ajay buys 18 oranges for ₹ 90 and sells 15 oranges for ₹ 105. Find the percentage of his gain.

जै 5६ - 4। लख खेलि जटखीनर कब खर
खर खेलि जखर 2 - 4। लखि र कब)खर
सूर शर 8 0रे गे शर

SSC CPO 10/11/2022 (Shift-02)

- (a) 35% (b) 30%
(c) 25% (d) 40%

29. A shopkeeper sells his items using a faulty balance which measures 25% less. He then marks up his items 15% above the cost price. If he also gives a discount of 10% then find his net profit percentage on 1 kg items.

ए नर नये जॉर्ज ए शर खर शर नखि, ख
यहं शर)दि ख शर जै बि र कब हजखर 2
श। र खर कब यि। क जॉर्ज ए शर खर
यि प। त्र खर 2 जै 7 श। त्र जै खे
शेर कब न। क खर 2 शी धं (0री नेज
कब खर खै श वरू ए शर खर)खर 0र
सूर 8 0रे गे शै हं

SSC CPO 10/11/2022 (Shift-02)

- (a) 32% (b) 41%
(c) 44% (d) 38%

30. Satish bought 35 notebooks for ₹ 700 and sold 28 of them for ₹ 600. Find his percentage gain.

खै 0र जु ६६ - 4। लख र्चि टखीनी
जख)। लख र्चि र्चि . ६६ - 4। लखि
नीड)खर 8 0रे तूर गे शर

SSC CPO 10/11/2022 (Shift-03)

- (a) $7\frac{1}{7}\%$ (b) $9\frac{1}{7}\%$
(c) $6\frac{1}{7}\%$ (d) $8\frac{1}{7}\%$

31. Ravi buys salt at ₹ 16 per kg and sells it ₹ 18 per kg. He also uses the weight of 900 gm instead of 1000 gm. What is Ravi's actual profit percentage?

SOLUTIONS

1. (b) Let the CP of 1st & 2nd shirt = 100 unit

I	II	
CP → $100_{\times 2 \times 97}$	$100_{\times 108}$	
= 19400	= 10800 → 30200	
P/L% → 8%	-3%	→ + 1128
SP → $108_{\times 2 \times 97}$	$97_{\times 108}$ → 31428	
= 20952	= 10476	

$$P\% = \frac{1228}{30200} \times 100 = 4.07\%$$

2. (b) $22\% = \frac{22}{100}$, $35\% = \frac{35}{100}$

	CP	SP
Price/Rate	100	78
Quantity	$\frac{65}{65}$	$\frac{100}{78}$
		+13 profit

$$\text{Actual profit} = \frac{13}{65} \times 100$$

$$= 20\% \text{ profit}$$

3. (b) Let, Total number of item = 100
Let, CP of 1 item = 10
Total CP = 1000

$$\text{Overall profit} = 1000 \times \frac{19}{100} \Rightarrow 190$$

$$\text{CP of items that did not go bad} = 10 \times 70 = 700$$

$$\text{S.P} = 1000 + 190 = 1190$$

$$\text{Required}\% = \frac{1190 - 700}{700} \times 100$$

$$= \frac{490}{7} = 70\%$$

4. (c) Let CP of each article = 100 unit
Then,
ATQ,
 $P\% = 10\%$ and 7%
 $SP_1 = 110$ unit
 $SP_2 = 107$ unit
Difference $110 - 107 = 3$ unit → Rs.6
⇒ C.P = 100 unit → Rs. 200

5. (a) Let price of article x be 'x' and price of article y be $x + 90$
ATQ,

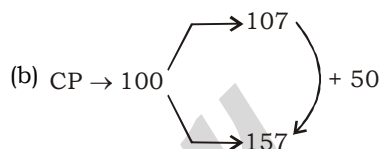
$$\frac{23}{100}x - \frac{13}{100}(x + 90) = 180$$

$$\Rightarrow x - 117 = 1800$$

$$\Rightarrow x = 1800 + 117 \Rightarrow 1917$$

$$\therefore \text{CP of } y = x + 90 = 1917 + 90 = 2007$$

6. (b) CP → 100



ATQ,

$$50 \text{ unit} \rightarrow 1329$$

$$100 \text{ unit} \rightarrow 2658$$

Hence the CP of watch is Rs.2658

7. (a) $10\% = \frac{1}{10}$, $25\% = \frac{1}{4}$

	CP	SP
Price	100	90
Quantity	$\frac{3}{15}$	$\frac{4}{18}$
⇒	5	6

$$\therefore \text{Profit}\% = \frac{1}{5} \times 100 = 20\%$$

8. (d) Let the CP of the table = 100 unit

$$\text{SP of the table} = 135 \text{ unit}$$

$$\text{New SP of table} = 112 \text{ unit}$$

ATQ,

$$\text{New SP} = \frac{5670}{135} \times 112$$

$$= 4704$$

9. (c)
Let, Profit earned by third seller be a%

	CP	SP
I	5	6
II	4	5
III	$\frac{100}{100}$	$\frac{100+a}{165}$
	20	33

$$\therefore \frac{200}{300 + 3a} = \frac{20}{33}$$

$$\Rightarrow 330 = 300 + 3a$$

$$\Rightarrow a = 10\%$$

10. (a)

$$12\% = \frac{12}{100} \Rightarrow \frac{88}{100}, 25\% = \frac{1}{4} \Rightarrow \frac{5}{4}$$

	CP	SP
Rate/Price	88	100
Total price	$\frac{4}{88}$	$\frac{5}{100}$
Quantity	10	11

$$\Rightarrow \text{Required}\% = \frac{1}{10} \times 100 = 10\%$$

11. (a) $42 \text{ SP} - 42 \text{ CP} = 7 \text{ SP}$
 $\Rightarrow 35 \text{ SP} = 42 \text{ CP}$

$$\frac{\text{SP}}{\text{CP}} = \frac{6}{5} \Rightarrow +1$$

$$\therefore P\% = \frac{1}{5} \times 100 = 20\%$$

12. (b) Given,
CP = 625, SP = 550
Loss = CP - SP $\Rightarrow 625 - 550 \Rightarrow 75$

$$\text{Loss}\% = \frac{75}{625} \times 100 \Rightarrow 12\%$$

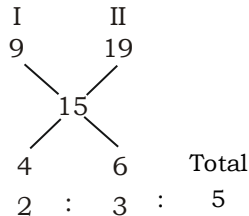
13. (c)
- | | CP | SP |
|----------|-----------------|-----------------|
| Price | 100 | 76 |
| Quantity | $\frac{19}{19}$ | $\frac{50}{38}$ |
| | 1 | 2 |

$$\text{Profit}\% = \frac{1}{1} \times 100 = 100\%$$

14. (a) Let, CP be 100
ATQ,
 $SP_1 = 76$
For → 24% profit
 $SP_2 = 124$

$$\text{Now } SP_2 = \frac{1596}{76} \times 124 = 2604$$

15. (a)



ATQ,

5 → 650 kg

2 → 260 kg

Quantity of wheat is 260 kg.

16. (b) Overall percentage P/L:-

$$+20 - 20 - \frac{20 \times 20}{100}$$

$$\Rightarrow -4\%$$

$$\Rightarrow 4\% \text{ loss}$$

Alternate method:

$$\text{Loss\%} = \frac{(-20\%)^2}{100} = -4\%$$

17. (c)

	CP	SP
Price	36	40
Quantity	800	1000
Final Price	72	100
	+28	

$$\therefore \text{Profit\%} = \frac{28}{72} \times 100 \Rightarrow 38.89\%$$

18. (b) Total SP = 1500 + 2800 + 3500 = 7800

$$\text{Total CP} = \left(\frac{1500}{5} \times 4 \right) + \left(\frac{2800 \times 2}{1} \right)$$

$$+ \left(\frac{3500 \times 4}{5} \right)$$

$$= 1200 + 5600 + 2800$$

$$= 9600$$

$$\text{Overall loss\%} = \frac{9600 - 7800}{9600} \times 100$$

$$= \frac{18}{96} \times 100 = 18.75\%$$

19. (b) Let the error in whole transactions be x gm.

$$\text{Profit\%} = \frac{\text{Error}}{[\text{True Value} - \text{Error}]}$$

$$\Rightarrow 25\% = \frac{x}{2000 - x}$$

$$\Rightarrow \frac{25}{100} = \frac{x}{2000 - x}$$

$$\Rightarrow \frac{1}{4} = \frac{x}{2000 - x}$$

$$\Rightarrow 2000 - x = 4x$$

$$\Rightarrow x = 400 \text{ gm}$$



SMART APPROACH:-

Given that, Profit% = 25%

Hence, CP : SP = 4 : 5

5 Units = 2000 gm

1 units = 400 gm

Required Error = 400 gm

20. (a) Before Raid,
Due to Fault in Machine it reads
1 kg when 900 gm is actually
weighted and the shopkeeper also
marks 10% above
900 → 1000 → 1100

$$\Rightarrow \text{Profit} = \frac{2}{9}$$

After Raid,

Gave punishment to sell the
goods at 10% discount on cost
price for a month

Cost price = 10

Selling price = 9

Before the Raid Price

$$= \frac{20}{9} \times 10 \times \frac{11}{9} = \frac{2200}{81} = 27.16$$

21. (d)
Let the cost price of 1000g is ₹ 1000
Selling Price = 110% of 1000
= ₹ 1100

Uses 20% less weight instead of
actual weight.

It means he gave 800 g instead
of 1000 g.

Hence, He sells 800g at ₹ 1100
which costs him ₹ 800

$$\text{Profit} = 1100 - 800$$

$$\text{Profit\%} = \frac{\text{Profit}}{\text{CP}} \times 100\%$$

$$= \frac{300}{800} \times 100\% = 37.5\%$$



SMART APPROACH:-

CP SP

10 11

4 5

40 55

$$\text{Actual profit\%} = \frac{15}{40} \times 100 = 37.5\%$$

22. (a) Let the cost price of Aman = 100 units

$$\text{Aman} \xrightarrow{\text{Sold @10\% Loss}} \text{Anuj} \xrightarrow{\text{Sold @12\% Loss}} \square$$

$$100 \longrightarrow 90 \longrightarrow 88\% \text{ of } 90 = 79.2$$

Selling Price of Anuj = 79.2 units
79.2 units = 554400

$$1 \text{ unit} = \frac{554400}{79.2} = 7000$$

$$100 \text{ units} = 700000$$



SMART APPROACH:-

CP SP

10 9

25 22

125 99

∴ Cost price for Aman

$$= \frac{5,54,400}{99} \times 125$$

$$= \text{Rs. } 700,000$$

23. (d) Let the cost price of the article
= x & profit% = x

$$\text{SP} = \text{CP} + \text{P\% of CP}$$

$$\Rightarrow 1200 = x + x\% \text{ of } x$$

$$\Rightarrow 1200 = x + \frac{x^2}{100}$$

$$\Rightarrow 120000 = 100x + x^2$$

$$\Rightarrow x^2 + 100x - 120000 = 0$$

$$\Rightarrow x^2 + 400x - 300x - 120000 = 0$$

$$\Rightarrow x(x + 400) - 300(x + 400) = 0$$

$$\Rightarrow (x + 400)(x - 300) = 0$$

$$\Rightarrow x = -400 \text{ or } x = 300$$

∴ Negative Value can not be
considered as cost price.

Hence, Cost Price = ₹ 300

24. (c) Let the CP of the article
= 100%

ATQ,

There is a loss of 45% while
selling the article at $\frac{3}{8}$ of SP.

Initial Selling Price = 8

New Selling Price = 3

Hence, 55% = 3

$$\therefore 100\% = \frac{3}{55} \times 100 = \frac{60}{11}$$

$$\text{CP} = \frac{60}{11} \text{ and } \text{SP} = 8$$

$$\text{Profit} = \text{SP} - \text{CP}$$

$$= 8 - \frac{60}{11} = \frac{88 - 60}{11} = \frac{28}{11}$$

$$\text{Profit\%} = \frac{\text{profit}}{\text{cost price}} \times 100\%$$

$$= \left(\frac{28}{11} \right) \times 100\% = \frac{28}{60} \times 100\%$$

$$= 46.67\% = 47\% \text{ (Approx)}$$

25. (b) **Method-1**

CP	SP
20	23
5	6
100	138

Swati bought at,

$$\frac{24840}{138} \times 100 = \text{Rs. } 18000$$

No need of doing complete calculation as 24840 is a multiple of 9, Answer must be a multiple of 9 only option (b) satisfied.

Method-2

Let the Swati's CP = 100 units

Swati	Ankita	Aashi
100 @15% Profit = 15	115 @20% Profit = 23(20% of 115)	138

$$\therefore 138 \text{ units} = 24840$$

$$\therefore 1 \text{ unit} = \frac{24840}{138}$$

$$\therefore 100 \text{ units} = 18000$$

Hence, Swati's cost price = 18000

26. (c)

1 st Bicycle	2 nd Bicycle
1	1
10%	x%
20%	

$$\frac{10 + x}{2} = 20$$

$$10 + x = 40$$

$$x = 30$$

$\therefore$ Profit on other bicycle = 30%

27. (d)

$$\text{Net change} = \left(25 - 30 - \frac{25 \times 30}{100} \right) \%$$

$$= (-5 - 7.5) \%$$

$$= -12.5 \%$$

Therefore, price will decrease by 12.5%

28. (d) Cost Price of 1 orange

$$= \frac{90}{18} = \text{₹ } 5$$

Selling price of 1 orange

$$= \frac{105}{15} = \text{₹ } 7$$

$$\text{Profit} = \text{SP} - \text{CP} = 7 - 5 = 2$$

$$\text{Profit percentage} = \frac{\text{profit}}{\text{CP}} \times 100 \%$$

$$= \frac{2}{5} \times 100 \% = 40 \%$$

29. (d) Let the price of 1 kg = ₹ 1000

$$\text{MP} = \text{₹ } 1150$$

$$\text{SP} = 90\% \text{ of } 1150 = \text{₹ } 1035$$

$$\text{CP of 750 gm} = \text{₹ } 750$$

$$\text{SP of 750 gm} = \text{₹ } 1035$$

$$\text{Net profit} = 1035 - 750 = \text{₹ } 285$$

$$\text{Profit} \% = \frac{285}{750} \times 100 = 38 \%$$

SMART APPROACH:-

CP	SP
750	1000
100	115
100	90
600	828
$P\% = \frac{228}{600} \times 100 = 38 \%$	

$$30. (a) \text{ CP of 1 Notebook} = \frac{700}{35} = \text{₹ } 20$$

$$\text{SP of 1 Notebook} = \frac{600}{28} = \text{₹ } 21 \frac{3}{7}$$

$$\text{Profit} = 21 \frac{3}{7} - 20 = 1 \frac{3}{7} = \frac{10}{7}$$

$$\text{Profit} \% = \frac{10}{7} \times \frac{1}{20} \times 100 \% = 7 \frac{1}{7} \%$$

31. (d) **Case-I**

$$\text{CP} : \text{SP} = 16 : 18$$

$$= 8 : 9$$

Case-II

$$\text{CP} : \text{SP} = 900 : 1000$$

$$= 9 : 10$$

$$\text{Final, } \frac{\text{SP}}{\text{CP}} = \frac{9}{8} \times \frac{10}{9} = \frac{90}{72}$$

$$\text{Profit} \% = \frac{90 - 72}{72} \times 100 \%$$

$$= \frac{18}{72} \times 100 \% = 25 \%$$

SMART APPROACH:-

CP	SP
8	9
9	10
72	90
$\text{Profit} \% = \frac{18}{72} \times 100 = 25 \%$	

32. (b)

CP	SP
23	20
4	5
92	100

$$\text{Profit} \% = \frac{8}{92} \times 100 = 8 \frac{16}{23} \%$$

33. (d) Initial profit = 5%

CP	SP
20	21

$$\text{New CP} = 21 \times \frac{23}{20} \times \frac{20}{23} = 21$$

$$\% \text{ increase in CP} = \frac{1}{20} \times 100 \% = 5 \%$$

$$34. (b) \text{ Gain} \% = \frac{4}{24 - 4} \times 100 \% = 20 \%$$

$$35. (c) \text{ Cost Price of Swastik} = 75000$$

$$\text{Loss} = 10 \%$$

$$\text{Selling Price} = \text{CP} \times \frac{(100 - L\%)}{100}$$

$$= 75000 \times \frac{90}{100} = 67500$$

$$\text{Cost Price of Anju} = 67500$$

$$\text{Profit} = 20 \%$$

Selling Price of Anju

$$= \text{CP} \times \frac{(100 + P\%)}{100}$$

$$= 67500 \times \frac{120}{100} = 81000$$

36. (a) -16% and 8%

$$\text{Difference} = 8 - (-16) = 24 \%$$

$$\text{So, } 24\% = 660$$

$$100\% = \frac{660}{24} \times 100 = 110 \times 25$$

$$12\% \text{ profit} = 110 \times 25 \times \frac{12}{100}$$

$$= 110 \times 28 = \text{Rs. } 3080$$

C.P	S.P
100	110
80	112

37. (a)

$$2 \text{ unit} \rightarrow 1000$$

$$\therefore \text{C.P of article, } 100 \text{ unit} = 500$$

$$\times 100 = \text{Rs. } 50,000$$

C.P	S.P
100	110
80	112

38. (d)

$$2 \text{ unit} \rightarrow 1000$$

$$\therefore \text{Earlier S.P} = 500 \times 110 = 55,000$$

$$39. (b) 50 \times \text{SP} = 42 \times \text{CP}$$

$$\frac{\text{SP}}{\text{CP}} = \frac{21}{25}$$

$$\text{Loss} \% = \frac{21 - 25}{25} \times 100 \%$$

$$= \frac{-4}{25} \times 100 = -16 \%$$

40. (c) Difference = 8 - (-16) = 24%

$$\therefore 24\% = 660$$

$$100\% = 110 \times 25 = 2750$$

New Profit%

$$= \left(\frac{3080 - 2750}{2750} \right) \times 100 \%$$

$$= \frac{330}{2750} \times 100 \% = 12 \%$$

41. (b) Difference = (9.5) - (13.5) = 23%

$$23\% = 1104$$

$$100\% = 4800$$

42. (d) According to the question

$$100 \text{ SP} - 100 \text{ CP} = 40 \text{ CP}$$

$$100 \text{ SP} = 140 \text{ CP}$$

$$\frac{\text{CP}}{\text{SP}} = \frac{100}{140}$$

$$\text{P\%} = \frac{40}{100} \times 100\% = 40\%$$

43. (d) Selling an article for Rs 1134 and suffers as much loss as she would have gained by selling it at 10% profit.

$$\text{CP} = \frac{1134}{9} \times 10 = 1260$$

$$\text{SP} = 1354.5$$

$$\text{Profit\%} = \frac{(1354.5 - 1260)}{1260} \times 100\% = 7.5\%$$

44. (a) 24% 40%

$$\begin{array}{ccc} & x & \\ 75 & : & 25 \\ 3 & : & 1 \end{array}$$

$$= x = \frac{24 \times 3 + (1 \times (-40))}{4}$$

$$= 4x = 72 - 40$$

$$= x = 8\% \text{ gain}$$

45. (d) CP SP
3750 113% of 3750 = 4237.5

$$\text{New SP} = 4237.5 + 607.5 = 4845$$

$$\% \text{ profit} = \frac{(4845 - 3750)}{3750} \times 100\%$$

$$= \frac{1095}{3750} \times 100\% = 29.2\%$$

46. (d) Let CP = x

ATQ,

$$\Rightarrow (1100 - x) = 3(x - 700)$$

$$\Rightarrow 1100 - x = 3x - 2100$$

$$\Rightarrow 3200 = 4x$$

$$\Rightarrow x = 800$$

To gain 12.5% must be sold at

$$= \frac{800}{8} \times 9 = \text{Rs. } 900$$

47. (d) CP of the article = x

$$\text{ATQ, } (115 - x) = (x - 104) \times \frac{120}{100}$$

$$\Rightarrow 5(115 - x) = 6(x - 104)$$

$$\Rightarrow 575 - 5x = 6x - 624$$

$$\Rightarrow 11x = 1199$$

$$\Rightarrow x = 109$$

$$\text{CP} = 109$$

$$\text{New SP} = 130.8$$

$$\text{Profit\%} = \frac{(130.8 - 109)}{109} \times 100\%$$

$$= 20\%$$

48. (c) Let SP = 500

Had it been sold at $\frac{4}{5}$ of that price there would have been loss of 10%

$$500 \times \frac{4}{5} = 400 \text{ (New SP)}$$

$$\text{Loss} = 10\% = \frac{1 \rightarrow \text{Loss}}{10 \rightarrow \text{CP}},$$

$$\text{SP} = 9$$

$$\text{CP} = \frac{400}{9} \times 10$$

$$\text{CP : SP}$$

$$\frac{400}{9} \times 10 : 500$$

$$4000 : 4500$$

$$\text{Profit \% at initially} = \frac{5}{40} \times 100\% = 12.5\%$$





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DISCOUNT

03

प्रतिशर्लि

1. An item with a marked price of Rs.3,800 was sold for Rs.3,496, after a discount of $y\%$ was offered. What was the value of y ?

3,800। कसी शि शि ह्ज ज नंखे यै। प. श
यतज्ज y%शि र्प र्शि र्पदे शि ब्रैद 3,496
कसी निहैबदप. 2।इै र्प yशि नै मिी इै ल

SSC CPO 03/10/2023 (Shift-01)

- (a) 8.5% (b) 7.5%
(c) 8% (d) 7%

2. If the price item is increased by 70% and then allows a scheme discount of 5% and 20% on this marked price. If price is paid in cash and additional discount of 20% is allowed then what is his gain percentage?

[illegible]

SSC CPO 03/10/2023 (Shift-01)

- (a) 2.25% (b) 3.25%
(c) 4.36% (d) 3.36%

3. If the marked price is 75% more than the cost price and a discount of 40% is allowed on the marked price, then the percentage profit is:

१. यदि हूज नखे षगो निखे ? १।५% रस
 अर्थात् हूज नखे सिप्र ५०% र्ष र्दिप
 , जर्प अर्जै क्जौ जौ चै कै जर्ष प्रह

SSC CPO 03/10/2023 (Shift-02)

- (a) 7% (b) 6%
- (c) 8% (d) 5%

4. An item with a marked price of ₹1,940 was sold at a discount of 15%. At what price (in ₹) was the item sold?

रख ५५० शि ११ ह्ज जनिंखे यियै। प. श यितजव
शै ११ ख ५१ श प ११ सिप्रि बढै ११ श यितजव
र ११ निंखे सिप्रि ११ निह्जि बढै ११ २१

SSC CPO 03/10/2023 (Shift-02)

- (a) 1649 (b) 1639
(c) 1659 (d) 1654
5. The price of a treadmill is marked at Rs.1,250. A shopkeeper earns a profit of 14% after allowing a discount of 14% on the marked price. Find the cost price (to the nearest rupee) of the treadmill.

/ ए णि सा। शि पंश पाजि खण्णा किस्सि । ह ज
अह्मि श दिस्से दै प्रो ह ज नखे सिप्पि ग्ग%शि प
' णि दे शि वै दाक्खि %शि णि । चै श नै जै अ
णि स। शि णि । ज नखे शि रे श जि निक्कि निह
दै ज श प्रल

SSC CPO 03/10/2023 (Shift-3)

- (a) Rs.943 (b) Rs.1,043
(c) Rs.840 (d) Rs.845

6. A shopkeeper allows a discount of 15% on an article and still makes a profit of 20%. What does the shopkeeper pay for an article whose marked price is Rs.7,200?

१. ए फि दसै दे प्र, ए यतजि सप्र खरु ए पं फि
 दजै अरि ए सप्र चै प ०% ए फि चै ए नै जै अरि
 दसै दे प्र (१ यतजि शरि ए स्र जै चै जै
 ए प्रै अरि, ए फि ह ज नखे ए ००० क्मि अरि

SSC CPO 03/10/2023 (Shift-3)

- (a) Rs.5,100 (b) Rs.5,120
(c) Rs.6,100 (d) Rs.6,120

7. A vendor bought a book marked at Rs.850 at successive discounts of 20% and 10%, respectively. He spent Rs.55 on transport and sold the book for Rs.980. What will be his profit percentage (rounded off to 2 decimal places)?

/ शरियग जैरि ए०किरी रि हर्जनंखे यै। प
 / शरि जैरि गनै धि ८०% रि शरि १०% श
 गसरि रि सरि प्रररि (?) सप्रयअ रि सर
 एरि की रि धूरि रि शरि जैरि 5.०किरी
 नहिदरि (?) रि शरि जैरि १०% रि शरि १८
 दै। यतिरि हर्जि रि हर्जि

SSC CPO 03/10/2023 (Shift-3)

- (a) 46.93% (b) 50.65%
- (c) 48.25% (d) 45.65%

8. After deducting a commission of 20%, a DVD set costs ₹9,080. Its marked price is:

20% शैक्षणिक शैक्षिक विवरण, ए
पाप पत्रिका गिननिखे रर9,080 अंज
अर्ह 27 शैक्षणिक जिननिखे मीमि अल

SSC CPO 04/10/2023 (Shift-01)

- (a) ₹11,350 (b) ₹10,100
(c) ₹10,000 (d) ₹11,200

9. Rakhi purchased a basket, a wallet and a belt. She got discounts of 5%, 8% and 10% on the basket, the wallet and the belt, respectively, on their respective marked prices of ₹80, ₹150 and ₹350. How much amount (in ₹) did she pay in total?

प्रेमैर्पि शिष्यैश्च प्रमदं शसिः पूतिः च्छि श
बर्खिः प्रमैर्ज्ञ (?) शिष्यैश्च प्रमदं सः पूतिः च्छि बर्खि
श गिन) धरु 80, रु 150 शिष्यैश्च रु 350 शि
। ह्यजं खं हि सप्रगिन) धरु 5%, 8%, शिष्यैश्च
10% शिष्यैश्च शिष्यैश्च शिष्यैश्च (?) शिष्यैश्च जे प
प्रेमैर्पि रु 8 रु 8 शिष्यैश्च शिष्यैश्च शिष्यैश्च

SSC CPO 04/10/2023 (Shift-01)

- (a) 51 (b) 529
(c) 580 (d) 519

10. If a shopkeeper allows a discount of 10% to his customers and still gains 30%, then find the marked price of an article which costs ₹450 is:

१। यदि श्रद्धा दै प्रीति से १% है तो २%
श्रद्धा की दृष्टि से ३% और ४% है
२। यदि श्रद्धा दै प्रीति से ५% है तो ६%
श्रद्धा की दृष्टि से ७% और ८% है

SSC CPO 04/10/2023 (Shift-02)

- (a) ₹700
(b) ₹500
(c) ₹650
(d) ₹750

11. What is the difference between a single discount of 35% on ₹700 and two successive discounts of 18% and 12% on the same amount (correct to two places of decimals)?

₹100 पर 10% की छूट दी गई है। फिर 10% की छूट दी गई है।
प्रश्न) इस वस्तु का निम्नलिखित में से कौन सा विकल्प सही है?
(a) ₹50.12 (b) ₹52.10
(c) ₹51.20 (d) ₹49.80

SSC CPO 04/10/2023 (Shift-02)

12. On an item, there is an 18% discount on the marked price of Rs.26,000. After giving an additional season's discount, the item is sold at Rs.16,000. How much was the season's discount correct upto two places of decimal?

→ श्रद्धांश 18% पर 26,000 रुपये की वस्तु पर 18% की छूट दी गई है।
प्रश्न) इस वस्तु का निम्नलिखित में से कौन सा विकल्प सही है?
(a) 24.95% (b) 22.45%
(c) 24.65% (d) 35.25%

SSC CPO 04/10/2023 (Shift-3)

13. Ramesh gives 15% additional discount along with a discount of 25% on the marked price of a sofa set. If the selling price of the sofa set is Rs.12,750, then find the marked price of the sofa set.

→ रामेश 25% की छूट के साथ 15% की अतिरिक्त छूट देता है।
प्रश्न) इस वस्तु का निम्नलिखित में से कौन सा विकल्प सही है?
(a) ₹22,000 (b) ₹23,000
(c) ₹24,000 (d) ₹20,000

SSC CPO 04/10/2023 (Shift-3)

14. An item with a marked price of Rs z was sold for Rs 6,622, after a discount of 12% was offered. What was the value of z?

→ एक वस्तु का निम्नलिखित में से कौन सा विकल्प सही है?
(a) ₹7575 (b) ₹7425
(c) ₹7525 (d) ₹7500

SSC CPO 05/10/2023 (Shift-01)

15. A shopkeeper increases the cost price of an item by 50% and offers a discount of 40% on this marked price. What is his loss percentage?

→ एक दुकानदार एक वस्तु की लागत की तुलना में 50% की छूट देता है।
प्रश्न) इस वस्तु का निम्नलिखित में से कौन सा विकल्प सही है?
(a) ₹11,520 (b) ₹13,520
(c) ₹9,850 (d) ₹10,260

SSC CPO 05/10/2023 (Shift-01)

- (a) 15% (b) 10%
(c) 5% (d) 20%

16. The difference between a discount of 30% on Rs.5,000 and two successive discounts of 15% and 25% on the same amount is:

→ एक वस्तु की लागत की तुलना में 30% की छूट देना और दो क्रमिक छूटों 15% और 25% देना एक ही है।
प्रश्न) इस वस्तु का निम्नलिखित में से कौन सा विकल्प सही है?

SSC CPO 05/10/2023 (Shift-2)

17. Two successive discounts of 30% and 20% are equivalent to a single discount of:

→ दो क्रमिक छूटों 30% और 20% एक ही छूट के बराबर हैं।
प्रश्न) इस वस्तु का निम्नलिखित में से कौन सा विकल्प सही है?

SSC CPO 05/10/2023 (Shift-2)

18. An article is sold at a discount of 25% and an additional discount of 28% is allowed on cash payment. If Ramendra purchased the article by paying Rs.10,800 in cash, then what was the marked price of the article?

→ एक वस्तु का निम्नलिखित में से कौन सा विकल्प सही है?
(a) ₹20,800 (b) ₹20,000
(c) ₹19,800 (d) ₹18,000

SSC CPO 05/10/2023 (Shift-3)

19. A shopkeeper marked the price as Rs.15,000 on an article, and a successive discount of 5%, 10% and 20% was allowed on it. What is the selling price?

→ एक दुकानदार एक वस्तु की लागत की तुलना में 5%, 10% और 20% की छूट देता है।
प्रश्न) इस वस्तु का निम्नलिखित में से कौन सा विकल्प सही है?

SSC CPO 05/10/2023 (Shift-3)

20. A tradesman marks his goods at 26% above the cost price. He allows his customer a discount of 12% on the marked price, His profit per cent is:

→ एक व्यापारी अपने वस्तुओं की लागत की तुलना में 26% की छूट देता है।
प्रश्न) इस वस्तु का निम्नलिखित में से कौन सा विकल्प सही है?

SSC CPO 09/11/2022 (Shift-01)

- (a) 10.88% (b) 11.08%
(c) 10.50% (d) 10%

21. A mixer marked at ₹ 2,300 is sold for ₹ 2,024. What is the percentage of discount?

→ एक मिश्रक ₹ 2,300 पर चिह्नित है।
प्रश्न) इस वस्तु का निम्नलिखित में से कौन सा विकल्प सही है?

SSC CPO 09/11/2022 (Shift-01)

- (a) 13% (b) 10%
(c) 12% (d) 11%

22. A person offers a 15% discount on his garments, and he offers a further discount of 10% on the reduced price to those customers who pay cash. What will a customer have to pay in cash for a jacket of ₹ 3,600?

→ एक व्यक्ति अपने वस्त्रों पर 15% की छूट देता है।
प्रश्न) इस वस्तु का निम्नलिखित में से कौन सा विकल्प सही है?

SSC CPO 09/11/2022 (Shift-02)

- (a) ₹ 3,240 (b) ₹ 3,366
(c) ₹ 2,754 (d) ₹ 3,060

23. A shopkeeper allows a discount of 15% on a text book with the marked price ₹ 100. On request, he further allows a discount of 10% on the new price of the goods. What is the overall discount given to the customer?

→ एक दुकानदार एक पाठ्यपुस्तक पर 15% की छूट देता है।
प्रश्न) इस वस्तु का निम्नलिखित में से कौन सा विकल्प सही है?

SSC CPO 09/11/2022 (Shift-02)

- (a) ₹ 23.50 (b) ₹ 75.00
(c) ₹ 25.00 (d) ₹ 76.50

24. A computer marked at ₹ 18,000 was sold at ₹ 15,840. The percentage of discount is:

SSC CPO 09/11/2022 (Shift-03)

35. A retailer offers the following discount schemes for buyers on an item.
- एक विक्रेता अपने ग्राहकों के लिए निम्नलिखित छूट योजनाएँ प्रस्तुत करता है।
- (i) Two successive discount of 15%
- दो क्रमिक 15% की छूट
- (ii) A discount of 20% followed by a discount of 10%
- 20% की छूट के बाद 10% की छूट
- (iii) A discount of 30%
- 30% की छूट
- Under which scheme the selling price will be maximum?
- किस योजना के तहत बिक्री कीमत अधिकतम होगी?
- SSC CPO 11/11/2022 (Shift-02)
- (a) ii (b) ii and iii
(c) i and ii (d) i
36. Elizabeth went to a furniture store and purchased a study table. She received a 20% discount on it. She would have saved ₹ 1,000 more if she had received a 25% discount. What was the marked price of the sofa?
- एलिजाबेथ एक फर्नीचर स्टोर गईं और एक अध्ययन मेज खरीदीं। उस पर 20% छूट मिली। यदि उसे 25% छूट मिलती, तो उसे ₹ 1,000 अधिक बचत होती। सोफे की चिह्नित कीमत क्या थी?
- SSC CPO 11/11/2022 (Shift-03)
- (a) ₹ 21,000 (b) ₹ 20,000
(c) ₹ 18,900 (d) ₹ 19,200
37. After successive discounts of 10% and 5%, an article was sold for ₹ 342. What was the original price of the article?
- 10% और 5% के क्रमिक छूट के बाद एक वस्तु ₹ 342 में बेची गई। वस्तु की मूल कीमत क्या थी?
- SSC CPO 11/11/2022 (Shift-03)
- (a) ₹ 400 (b) ₹ 342
(c) ₹ 300 (d) ₹ 442
38. A merchant marks up the price of his goods by 40% more than the cost price. He then sells $\frac{1}{5}$ of his goods at a discount of 10%, half of the goods at the marked price and the rest of the goods at a discount of 20%. Find his profit percentage.
- एक व्यापक अपने वस्तुओं की कीमत को मूल कीमत से 40% अधिक चिह्नित करता है। वह फिर $\frac{1}{5}$ हिस्से के वस्तुओं पर 10% छूट, आधा हिस्सा चिह्नित कीमत पर और शेष वस्तुओं पर 20% छूट पर बेचता है। लाभ प्रतिशत ज्ञात करें।

39. Three successive discounts 22%, 17% and 11% are equivalent to a single discount of:
- 22%, 17% और 11% के क्रमिक छूट एकल छूट के बराबर हैं:
- SSC CPO 23/11/2020 (Shift-1)
- (a) Approximately 45% (b) Approximately 50%
(c) Approximately 42% (d) Approximately 25%
40. Two successive discounts, each of $x\%$ on the marked price of an article, are equal to a single discount of Rs.331.20. If the marked price of the article is 920, then the value of x is:
- दो क्रमिक छूट, प्रत्येक $x\%$ चिह्नित कीमत पर, एकल छूट के बराबर हैं जिसकी राशि ₹ 331.20 है। यदि वस्तु की चिह्नित कीमत ₹ 920 है, तो x का मान क्या है?
- SSC CPO 23/11/2020 (Shift-1)
- (a) 20 (b) 18
(c) 15 (d) 25
41. A single discount equivalent to three successive discounts of 8%, 15% and 12% is:
- 8%, 15% और 12% के क्रमिक छूट के बराबर एकल छूट:
- SSC CPO 23/11/2020 (Shift-2)
- (a) 68.816% (b) 31.184%
(c) 35% (d) 17.5%
42. A single discount equivalent to three successive discounts of 6%, 15% and 14% is:
- 6%, 15% और 14% के क्रमिक छूट के बराबर एकल छूट:
- SSC CPO 24/11/2020 (Shift-1)
- (a) 68.714% (b) 34.357%
(c) 31.286% (d) 17.5%

43. On the marked price of Rs.1,250 of an article, three successive discounts of 5%, 15% and 20% are offered. What will be the selling price (in Rs.) after all discounts?
- एक वस्तु की चिह्नित कीमत ₹ 1,250 है। उस पर 5%, 15% और 20% के क्रमिक छूट प्रस्तावित हैं। सभी छूटों के बाद बिक्री कीमत (₹ में) क्या होगी?
- SSC CPO 24/11/2020 (Shift-2)
- (a) 1,000 (b) 807.50
(c) 975.75 (d) 950.25
44. On the marked price of an article, the sum of selling prices with a discount of 35% and two successive discounts of 20% and 15%, is Rs.1,995. The marked price of the article (in Rs.) is:
- एक वस्तु की चिह्नित कीमत पर, 35% छूट के साथ बिक्री कीमत और 20% और 15% के क्रमिक छूट के साथ बिक्री कीमतों का योग ₹ 1,995 है। वस्तु की चिह्नित कीमत (₹ में) क्या है?
- SSC CPO 24/11/2020 (Shift-2)
- (a) 1,550 (b) 1,800
(c) 1,500 (d) 1,600
45. Three successive discounts of 12%, 13% and 11% are equivalent to an approximate single discount of:
- 12%, 13% और 11% के क्रमिक छूट एकल छूट के बराबर हैं:
- SSC CPO 25/11/2020 (Shift-1)
- (a) 32% (b) 40%
(c) 42% (d) 35%
46. If two successive discounts, each of 20% on the marked price of an article, are equal to a single discount of Rs. 331.20, then the marked price (in Rs.) of the article is:
- यदि दो क्रमिक छूट, प्रत्येक 20% चिह्नित कीमत पर, एकल छूट के बराबर हैं जिसकी राशि ₹ 331.20 है, तो वस्तु की चिह्नित कीमत (₹ में) क्या होगी?
- SSC CPO 25/11/2020 (Shift-1)
- (a) 645 (b) 1,200
(c) 920 (d) 750
47. On the marked price of Rs.1,250 of an article, three successive discounts of 5%, 15% and 20% were offered. The amount (in Rs.) of discount received by a customer is:
- एक वस्तु की चिह्नित कीमत ₹ 1,250 है। उस पर 5%, 15% और 20% के क्रमिक छूट प्रस्तावित हैं। ग्राहक द्वारा प्राप्त छूट की राशि (₹ में) क्या होगी?

1. यदि यत्तज्ज्ञः 10% छूट देकर 800 रुपये में बेचता है, तो निम्नलिखित में से सही विकल्प चुनिए।

SSC CPO 25/11/2020 (Shift-2)

- (a) 450 (b) 807.50
(c) 950.25 (d) 442.50

48. On a marked price, the difference of selling prices with a discount of 35% and two successive discounts of 20% and 15%, is Rs.504. The marked price of the article (in Rs.) is:

यदि किसी वस्तु के लिए 35% छूट देने पर और दो क्रमिक छूटों 20% और 15% देने पर बिक्री के मूल्य में 504 रुपये का अंतर है, तो वस्तु के चिह्नित मूल्य (रु.) क्या है?

SSC CPO 25/11/2020 (Shift-2)

- (a) 18,000 (b) 16,800
(c) 15,500 (d) 16,000

49. After allowing a 10% discount on the marked price of an article, a dealer makes a profit of 5%. What is the marked price, if the cost price of the article is Rs. 300?

यदि किसी वस्तु के चिह्नित मूल्य पर 10% छूट देकर एक व्यापारी 5% लाभ कमाता है। यदि वस्तु के मूल्य 300 रुपये है, तो वस्तु के चिह्नित मूल्य क्या है?

SSC CPO 09/12/2019 (Shift-01)

- (a) Rs. 400 (b) Rs. 320
(c) Rs. 375 (d) Rs. 350

50. An article was sold for Rs. 98,496 after providing three successive discount of 10%, 5% and 4% respectively on the marked price. What was the marked price?

यदि किसी वस्तु के चिह्नित मूल्य पर क्रमशः 10%, 5% और 4% के तीन क्रमिक छूटों के बाद 98,496 रुपये में बेचा गया, तो वस्तु के चिह्नित मूल्य क्या था?

SSC CPO 09/12/2019 (Shift-01)

- (a) Rs. 1,20,000
(b) Rs. 1,10,700
(c) Rs. 1,20,200
(d) Rs. 1,20,500

51. After allowing 10% discount on the marked price of an article, a person makes a profit of 16%. If the cost price of the article is Rs. 648, then its marked price is:

यदि किसी वस्तु के चिह्नित मूल्य पर 10% छूट देकर एक व्यक्ति 16% लाभ कमाता है। यदि वस्तु के मूल्य 648 रुपये है, तो वस्तु के चिह्नित मूल्य क्या है?

SSC CPO 09/12/2019 (Shift-02)

- (a) Rs. 826.80 (b) Rs. 835.20
(c) Rs. 751.68 (d) Rs. 910.40

52. The marked price of an article is Rs. 530. After two successive discounts, it is sold for Rs. 396.44. If the first discount is 15% and the second discount is $x\%$, then what is the value of x ?

यदि किसी वस्तु के चिह्नित मूल्य 530 रुपये है। दो क्रमिक छूटों के बाद 396.44 रुपये में बेचा गया। यदि पहली छूट 15% है और दूसरी छूट $x\%$ है, तो x का मान क्या है?

SSC CPO 09/12/2019 (Shift-02)

- (a) 10.5 (b) 10
(c) 12.5 (d) 12

53. An article is sold for Rs. 680 after two successive discounts of 20% and $x\%$ on its marked price. The marked price of the article is Rs. 1,000. What is the value of x ?

यदि किसी वस्तु के चिह्नित मूल्य पर 20% और $x\%$ के दो क्रमिक छूटों के बाद 680 रुपये में बेचा गया। वस्तु के चिह्नित मूल्य 1,000 रुपये है। x का मान क्या है?

SSC CPO 11/12/2019 (Shift-01)

- (a) 15 (b) 15.5
(c) 12.5 (d) 16

54. The marked price of an article is Rs. 800. A retailer buys it for Rs. 540 after getting two successive discounts. The first discount is 25%. What is the second discount?

यदि किसी वस्तु के चिह्नित मूल्य 800 रुपये है। एक रिटेलर इसे 540 रुपये में खरीदता है, जो दो क्रमिक छूटों के बाद है। पहली छूट 25% है। दूसरी छूट क्या है?

SSC CPO 12/12/2019 (Shift-01)

- (a) 8% (b) 12%
(c) 10% (d) 15%

55. There is a 15% discount on 8 shirts marked at Rs. 9,600. How many shirts can be bought with Rs. 5,100?

8 शर्टों पर 15% छूट है, जो 9,600 रुपये में चिह्नित हैं। 5,100 रुपये में कितने शर्ट खरीदे जा सकते हैं?

SSC CPO 12/12/2019 (Shift-02)

- (a) 4 (b) 5
(c) 3 (d) 6

56. A shopkeeper has announced 40% rebate on the price of TV sets at the time of sale. If a purchaser needs to have a rebate of Rs. 26,400, then how many TV sets each costing Rs. 6,000 should he purchase?

यदि किसी वस्तु के चिह्नित मूल्य पर 40% छूट देने पर एक व्यक्ति 26,400 रुपये का छूट चाहता है, तो वह कितने टीवी सेटों की खरीद कर सकता है, जिनमें से प्रत्येक का मूल्य 6,000 रुपये है?

SSC CPO 12/12/2019 (Shift-02)

- (a) 9 (b) 11
(c) 8 (d) 12

57. A single equivalent discount equivalent to three successive discounts of 10%, 16% and 25%, is equal to 10%, 16%, 25% and 36% respectively. What is the value of x ?

SSC CPO 12/12/2019 (Shift-02)

- (a) 42% (b) 46.5%
(c) 41% (d) 43.3%

58. A person bought an article at 30% discount on its marked price. The person then sold it at 30% profit for Rs. 427.70. What was the marked price of the article?

यदि किसी वस्तु के चिह्नित मूल्य पर 30% छूट देकर एक व्यक्ति इसे खरीदता है। वह इसे 30% लाभ पर 427.70 रुपये में बेचता है। वस्तु के चिह्नित मूल्य क्या था?

SSC CPO 13/12/2019 (Shift-01)

- (a) Rs. 470 (b) Rs. 450
(c) Rs. 500 (d) Rs. 480

59. The marked price of a working machine is Rs. 7,200. If it is sold for Rs. 5,512.50, after two successive discount of $x\%$ each. The value of x is:

यदि किसी वस्तु के चिह्नित मूल्य 7,200 रुपये है। यदि इसे दो क्रमिक छूटों के बाद 5,512.50 रुपये में बेचा गया, तो x का मान क्या है?

SSC CPO 13/12/2019 (Shift-01)

- (a) 12 (b) 12.5
(c) 10.5 (d) 15

60. The marked price of an article is Rs. 250. After allowing two successive discounts of 20% and $x\%$ on the marked price, it is sold for Rs. 185.60. What is the value of x ?

यदि किसी वस्तु के चिह्नित मूल्य 250 रुपये है। यदि इसे दो क्रमिक छूटों के बाद 185.60 रुपये में बेचा गया, तो x का मान क्या है?

SSC CPO 13/12/2019 (Shift-02)

- (a) 8.4% (b) 7.6%
(c) 6.8% (d) 7.2%

61. Raghu sold an article for Rs.180 after allowing a 20% discount on its marked price. Had he not allowed any discount he would have gained 20%. What is the cost price of the article?

६१. राघु ने एक वस्तु को ₹ 180 में बेचा, जिस पर 20% छूट दे दिया था। यदि वह कोई छूट नहीं देता तो वह 20% लाभ कमाता। वस्तु का मूल्य क्या होगा?

SSC CPO 11/12/2019 (Shift-01)

- (a) Rs. 190.40 (b) Rs. 192.80
(c) Rs. 188.60 (d) Rs. 187.50

62. A trader buys an article at 80% of its marked price and sells it at 10% discount on its marked price. His percentage profit is:

६२. एक व्यापारी एक वस्तु को उसके मूल्य के 80% पर खरीदता है और 10% छूट पर बेचता है। उसका प्रतिशत लाभ क्या है?

SSC CPO 11/12/2019 (Shift-02)

- (a) $10\frac{1}{2}$ (b) 10
(c) $12\frac{1}{2}$ (d) 15

63. An article is marked at 100% above its cost price. After allowing two successive discounts of 5% and 20% respectively on the marked price, it is sold at x% profit. What is the value of x?

६३. एक वस्तु का मूल्य उसकी लागत की 100% से अधिक है। दो क्रमिक छूटों के बाद, जो क्रमशः 5% और 20% हैं, मूल्य पर, यह x% लाभ पर बेची जाती है। x का मान क्या है?

SSC CPO 11/12/2019 (Shift-02)

- (a) 48 (b) 75
(c) 72 (d) 52

64. If a discount of 10% is allowed on the marked price of an article, a shopkeeper gets a profit of 25%. If he offers a discount of 25% on the marked price of the same article, then his percentage profit loss will be:

६४. यदि एक वस्तु के मूल्य पर 10% छूट दिया जाए, तो एक दुकानदार 25% लाभ कमाता है। यदि वह उसी वस्तु के मूल्य पर 25% छूट देता है, तो उसका प्रतिशत लाभ या हानि क्या होगा?

SSC CPO 12/12/2019 (Shift-01)

- (a) 4% Profit
(b) $4\frac{1}{4}$ % Loss
(c) $4\frac{1}{6}$ % Profit
(d) 4% Loss

65. A dealer allows 25% discount of the marked price of an article and gains 20%. If the cost price of the article increases by 20%, how much discount percentage should he allow on the marked price so as to earn the same percentage of profit as before?

६५. एक व्यापारी एक वस्तु के मूल्य पर 25% छूट देता है और 20% लाभ कमाता है। यदि वस्तु की लागत 20% बढ़ जाती है, तो व्यापारी को मूल्य पर कितना छूट देना चाहिए ताकि उसका प्रतिशत लाभ वही रहे?

SSC CPO 13/12/2019 (Shift-02)

- (a) 8.5%
(b) 10%
(c) 12%
(d) 7.25%

ANSWER KEY

1.(c)	2.(d)	3.(d)	4.(a)	5.(a)	6.(d)	7.(a)	8.(a)	9.(b)	10.(c)
11.(a)	12.(a)	13.(d)	14.(c)	15.(b)	16.(a)	17.(a)	18.(b)	19.(d)	20.(a)
21.(c)	22.(c)	23.(a)	24.(c)	25.(c)	26.(a)	27.(b)	28.(b)	29.(b)	30.(a)
31.(b)	32.(a)	33.(c)	34.(b)	35.(a)	36.(b)	37.(a)	38.(c)	39.(c)	40.(a)
41.(b)	42.(c)	43.(b)	44.(c)	45.(a)	46.(c)	47.(d)	48.(b)	49.(d)	50.(a)
51.(b)	52.(d)	53.(a)	54.(c)	55.(b)	56.(b)	57.(d)	58.(a)	59.(b)	60.(d)
61.(d)	62.(c)	63.(d)	64.(c)	65.(b)					

SOLUTIONS

1. (c) MP = Rs.3800
SP = Rs.3496
D = 3800 - 3496 = 304

$$D\% (y\%) = \frac{304}{3800} \times 100 = 8\%$$

2. (d) Let, CP = 100
MP = 170
Then,
ATQ,

$$170 \times \frac{95}{100} \times \frac{80}{100} \times \frac{80}{100} = SP$$

$$\Rightarrow 170 \times \frac{19}{20} \times \frac{4}{5} \times \frac{4}{5} = SP$$

$$\Rightarrow \frac{34 \times 19 \times 4}{25} = SP$$

$$\Rightarrow 103.36 = SP$$

$$P = 103.36 - 100 = 3.36$$

$$\therefore P\% = \frac{3.36}{100} \times 100 = 3.36\%$$

3. (d)

+75%	+5%
MP	CP
175	100
105	105
- 40%	

$\therefore P\% = 5\%$

4. (a) Let the MP = 100 unit
D = 15%
SP = 85 unit
100 unit = Rs. 1940

$$85 \text{ unit} = \frac{1940}{100} \times 85 = \text{Rs. } 1649$$

5. (a) We know,

$$\frac{MP}{CP} = \frac{100 + P}{100 - D}$$

$$\Rightarrow \frac{1250}{CP} = \frac{114}{86}$$

$$\Rightarrow CP = \frac{1250 \times 86}{114}$$

$$= 942.9 \approx \text{Rs. } 943$$

6. (d) We know,

$$\frac{MP}{CP} = \frac{100 + P}{100 - D}$$

$$\frac{MP}{CP} = \frac{120}{85}$$

$$\Rightarrow CP = \frac{7200 \times 85}{120} = 5100$$

$$\therefore SP = 5100 \times \frac{120}{100} = \text{Rs. } 6120$$

7. (a) Eff. discount = $20 + 10 - \frac{20 \times 10}{100}$
= 28%

$$\text{Total CP} = \frac{72}{100} \times 850 + 55$$

$$= 612 + 55 = 667$$

$$SP = 980$$

$$P = 980 - 667 = 313$$

$$P\% = \frac{313}{667} \times 100 = 46.93\%$$

8. (a) M.P = $\frac{9080}{80} \times 100 = \text{Rs. } 11350$

9. (b)

	Bskt	W	Belt
MP	80	150	350
D	5%	8%	10%
SP	76	138	315

$$\text{Total SP} = 76 + 138 + 315$$

$$= 529$$

10. (c) We know,

$$\frac{MP}{CP} = \frac{100 + P}{100 - D}$$

$$MP = \frac{130}{90} \times 450$$

$$= 650$$

11. (a) Difference =

$$35 - \left(18 + 12 - \frac{18 \times 12}{100} \right)$$

$$= 35 - 27.84 = 7.16\%$$

$$\text{Difference} = \frac{7.16}{100} \times 700$$

$$= \text{Rs. } 50.12$$

12. (a) SP after I discount

$$\Rightarrow \frac{82}{100} \times 26000 = 21,320$$

$$\therefore \text{Seasonal discount}$$

$$\Rightarrow \frac{21320 - 16000}{21320} \times 100$$

$$= \frac{532000}{21320} = \frac{13300}{533} = 24.95\%$$

13. (d) Let MP = 100 unit
Effective discount = 25 + 15 - $\frac{25 \times 15}{100}$
= 40 - 3.75 = 36.25%

$$D = 100 \times \frac{36.25}{100} \Rightarrow 36.25 \text{ unit}$$

$$SP = 100 - 36.25 = 63.75 \text{ unit}$$

$$63.75 \text{ unit} \rightarrow 12750$$

$$100 \text{ unit} \rightarrow \frac{12750}{63.75} \times 100$$

$$= 20,000$$

14. (c) Z = $\frac{6622}{88} \times 100$
= 301 × 25
= Rs.7525

15. (b)

+50%
CP
100
MP
150
SP
90
- 40%

$$\text{loss} = 100 - 90 \Rightarrow 10$$

$$\text{Loss}\% = \frac{10}{100} \times 100 = 10\%$$

16. (a) Difference =

$$- 30\% + \left(15 + 25 - \frac{15 \times 25}{100} \right)$$

$$= - 30\% + (40 - 3.75\%)$$

$$\Rightarrow 6.25\%$$

$$\text{Difference} = \frac{6.25}{100} \times 5000$$

$$= \text{Rs. } 312.50$$

17. (a) Effective discount = 30 + 20 - $\frac{30 \times 20}{100}$
= 50 - 6 = 44%

18. (b) Let MP = 100
SP = 100 - 46 = 54
Effective discount = 25 + 28 - $\left(\frac{25 \times 28}{100} \right)$
= 53 - 7 = 46%

$$\therefore MP = \frac{10,800}{54} \times 100 = 20,000$$

19. (d) ATQ,

$$S.P = 15000 \times \frac{95}{100} \times \frac{90}{100} \times \frac{80}{100}$$

$$= 95 \times 9 \times 12 \Rightarrow 95 \times 108$$

$$= \text{Rs.} 10,260$$

20. (a)

CP	MP	SP
100	126	88% of 126 = 110.88

$$\text{Profit} = SP - CP$$

$$= 110.88 - 100 = 10.88$$

$$\text{Profit\%} = \frac{\text{Profit}}{CP} \times 100\%$$

$$= \frac{10.88}{100} \times 100\% = 10.88\%$$



SMART APPROACH:-

Apply Successive % change formula for 2 variable

$$P\% = +26 - 12 - \frac{26 \times 12}{100} = 10.88\%$$

21. (c) MP of the Mixer = ₹ 2300

SP of Mixer = ₹ 2024

Discount = MP - SP

$$= 2300 - 2024 = 276$$

$$D\% = \frac{D}{MP} \times 100\%$$

$$= \frac{276}{2300} \times 100\% = 12\%$$

22. (c) Effective Discount

$$= \left(15 + 10 - \frac{15 \times 10}{100} \right) \% = 23.5\%$$

Customer has to pay

$$= \frac{3600 \times 76.5}{100} = \text{Rs.} 2754$$

23. (a) Effective Discount

$$= \left(-15 - 10 + \frac{15 \times 10}{100} \right) \% = -23.5\%$$

Effective Discount (in ₹)

$$= 23.5\% \text{ of } 100 = ₹ 23.50$$

24. (c) Discount = MP - SP

$$= 18000 - 15840 = 2160$$

$$\text{Discount\%} = \frac{\text{Discount}}{MP} \times 100\%$$

$$= \frac{2160}{18000} \times 100 = 12\%$$

25. (c) Total Cost Price of 12 Article
= 12 × ₹ 750 = ₹ 9000

First discount = 8% of ₹ 9000

$$= ₹ 720$$

Payable Amount after discount

$$= ₹ 9000 - ₹ 720 = 8280$$

Since the payable amount is greater than ₹ 5000, other discounts are also applicable.

Other discount = 20% of ₹ 8280

$$= ₹ 1656$$

Final payable amount

$$= ₹ 8280 - ₹ 1656 = 6624$$

26. (a) When customer get lowest percent scratch card, selling price will be maximum

Maximum Selling Price

$$= 65000 - (2000 + 10\% \text{ of } 63000)$$

$$= 65000 - (2000 + 6300)$$

$$= 65000 - 8300 = 56700$$

When customer get highest percent scratch card, selling price will be minimum

Least Selling Price

$$= 65000 - (2000 + 15\% \text{ of } 63000)$$

$$= 65000 - (2000 + 9450)$$

$$= 65000 - 11450 = 53550$$

$$\text{Difference} = 56700 - 53550$$

$$= 3150$$



SMART APPROACH:-

$$\begin{aligned} \text{Difference} &= (15 - 10)\% \text{ of } (65000 - 2000) \\ &= 5\% \text{ of } 63000 \\ &= 3150 \end{aligned}$$

27. (b) Effective Discounts

$$= \frac{3}{5+3} \times 100\%$$

$$= \frac{3}{8} \times 100\% = 37.5\%$$

28. (b)

$$\text{Net Price} = 700 \times \frac{9}{10} \times \frac{4}{5} = \text{Rs.} 504$$

29. (b)

$$\text{MP of item} = \frac{2700}{90} \times 100 = \text{Rs.} 3000$$

30. (a)

Method-1

Commission(20%)	5	4
Markup	X	Y
Overall profit 5%	20	21

$$X : Y = \frac{20}{5} : \frac{21}{4} = 16 : 21$$

Commission(10%)	10	9
Markup	16	21
Overall	160	189

$$\begin{aligned} \text{Profit\%} &= \frac{29}{160} \times 100\% \\ &= 18.125\% = 18\% \end{aligned}$$

Method-2

$$\frac{MP}{CP} = \frac{100 + P\%}{100 - D\%} = \frac{105}{80} = \frac{21}{16}$$

Now, commission is 10% reduced

$$\text{i.e., } \frac{MP}{CP} = \frac{18.9}{16}$$

$$P\% = \frac{2.9}{16} \times 100 = \sim 18\%$$

31. (b) CP of 5 article = 5 × 1200 = 6000

SP of 4 article = 4 × 1800 = 7200

$$\text{Profit} = 7200 - 6000 = 1200$$

$$\text{Profit\%} = \frac{1200}{6000} \times 100\% = 20\%$$

32. (a) Let the marked price of watch be 100%

Difference in Discount = ₹ 45

$$3\% = 45$$

$$1\% = 15$$

$$100\% = 1500$$

33. (c) **Case-I**

Effective Discount

$$= \left(-25 - 15 + \frac{25 \times 15}{100} \right) \%$$

$$= (40 - 3.75)\% = 36.25\%$$

Case-II

Effective Discount

$$= \left(-35 - 5 + \frac{35 \times 5}{100} \right) \%$$

$$= (-40 + 1.75)\% = -38.35\%$$

Case-III

Single Discount = -38%

Hence, Best offer is only-II

Note: Since the sum of discount in I & II are same. therefore discount in greater difference will give bigger discount to the customer. Hence, In case II: 35 - 5 = 30 gives bigger discount to the customer now, compare II & III and get the desired answer

34. (b) Net Discount %

$$= \left(-20 - 10 + \frac{20 \times 10}{100} \right) \% = -28\%$$

$$SP = (100 - 28)\% \text{ of } 500 = ₹ 360$$

35. (a) **Case-I**

Effective Discount

$$= \left(-15 - 15 + \frac{15 \times 15}{100} \right) \%$$

$$= (-30 + 2.25)\% = -27.75\%$$

Case-II

Effective Discount

$$= \left(-20 - 10 + \frac{20 \times 10}{100} \right) \%$$

$$= (-30 + 2) \% = -28\%$$

Case-III

Discount = -30%

Lower the discount%, Higher will be the selling price.



SMART APPROACH:-

In case I & II we have the sum of both the given discounts same. Therefore, In case II difference = $20 - 10 = 10$ will give greater discount as compare to case I.

36. (b) Let the marked price of Study Table be $100x$.

Difference in discount

$$= (25x - 20x) = 5x$$

$$\therefore 5x = 1000$$

$$\Rightarrow x = 200$$

Thus, The MP of the table

$$= 100 \times 200 = 20000$$



SMART APPROACH:-

$\Rightarrow$ Difference in discounts = 1000
 $\Rightarrow 5\% = 1000$
 $\Rightarrow 100\% = 20000$

37. (a) Net Discount

$$= \left(10 + 5 - \frac{10 \times 5}{100} \right) \% = 14.5\%$$

Original Price of the article

$$= \frac{SP}{100 - D} \times 100 \%$$

$$= \frac{342}{(100 - 14.5)} \times 100 \%$$

$$= \frac{342}{85.5} \times 100 = \text{Rs } 400$$

38. (c) Let the total goods be 10 units.

Number of units sold at a discount of 10%

$$= 10 \times \frac{1}{5} = 2 \text{ units}$$

Number of units sold at MRP

$$= 10 \times \frac{1}{2} = 5 \text{ units}$$

Number of units sold at 20% discount = $10 - 7 = 3$ units

ATQ, Merchant marks up the price of goods by 40%

Profit earned when Merchant gives 10% discount

$$\text{Profit} = \left(40 - 10 - \frac{40 \times 10}{100} \right) \% = 26\%$$

Profit earned when Merchant gives No discount

$$\text{Profit} = 40\%$$

Profit earned when Merchant gives 20% discount

$$\text{Profit} = \left(40 - 20 - \frac{40 \times 20}{100} \right) \% = 12\%$$

Overall profit

$$= \left(\frac{2 \times 26 + 5 \times 40 + 3 \times 12}{10} \right) \%$$

$$= \left(\frac{52 + 200 + 36}{10} \right) \% = \frac{288}{10} \% = 28.8\%$$

39. (c) Single discount for 17% & 11%

$$= -17 - 11 + \frac{17 \times 11}{100}$$

$$= -28 + 1.87$$

$$= 26.13 \approx 26\%$$

Again, single discount for 26% & 22%

$$= -26\% - 22\% + \frac{22 \times 26}{100}$$

$$= -48 + 5.72$$

$$= -42.28\%$$

Thus, single discount for 22%, 17%, 11% = 42.28%.

40. (a) By option (A)

Single Discount

$$= -20 - 20 + \frac{20 \times 20}{100} = 36\%$$

$$\text{Price} = 920 \times \frac{36}{100}$$

$$= 331.2 \text{ (satisfied the question)}$$

41. (b) Single discount for 8%, 15%

$$= 8 - 15 + \frac{120}{100}$$

$$= -23 + 1.2 = -21.8\%$$

Again, single discount for 21.8% & 12%

$$= -21.8 - 12 + \frac{21.8 \times 12}{100}$$

$$= -33.8 + 2.616 = -31.184\%$$

Thus, single discount for 8%, 15% and 12% = 31.184%

42. (c)

Single discount for 6%, 15%

$$= -6 - 15 + \frac{90}{100}$$

$$= -21 + 0.9 = -20.1\%$$

Again, single discount for 20.1% & 14%

$$= -20.1\% - 14\% + \frac{20.1 \times 14}{100}$$

$$= -34.1 + 2.814$$

$$= -31.286\%$$

Thus, single discount for 6%, 15% and 14% = 31.286%

43. (b) $SP = MP \times (-5\%) \times (-15\%) \times (-20\%)$

$$= 1250 \times \frac{19}{20} \times \frac{17}{20} \times \frac{4}{5} = \text{Rs. } 807.5$$

Note: Complete calculation is not required, just check which option is divisible by either 17 or 19.

44. (c) Single discount for 20% and 15%

$$= -20 - 15 + \frac{300}{100} = 32\%$$

$$MP = x$$

$$\text{ATQ, } x \times 65\% + x \times 68\% = 1995$$

$$\Rightarrow 133\% x = 1995$$

$$\Rightarrow x = \frac{1995}{133} \times 100 = \text{Rs. } 1500$$

45. (a) Single Discount for 12% & 13%

$$= -12 - 13 + \frac{156}{100}$$

$$= -23.44\%$$

Again, single discount for 23.44% & 11%

$$= -23.44 - 11 + \frac{23.44 \times 11}{100}$$

$$= -34.44 + 2.57 = 31.87\%$$

Thus, single discount for 12%, 13%, 11% = 31.87%

46. (c) Single Discount of two successive discount of 20%

$$= -20 - 20 + \frac{400}{100} = -36\%$$

$$MP \times \frac{36}{100} = 331.20$$

$$MP = \frac{331.2}{36} \times 100 = \text{Rs. } 920$$

47. (d) Single Discount for 5% & 15%

$$= -5 - 15 + \frac{75}{100} = -19.25\%$$

Again, single discount for 19.25% & 20%

$$= -19.25 - 20 + \frac{19.25 \times 20}{100}$$

$$= -39.25\% + 3.85 = 35.4\%$$

Thus, single discount for 5%, 15% & 20% = 35.4%

$$\text{Net Discount} = 1250 \times \frac{35.4}{100}$$

$$= \text{Rs. } 442.50$$

48. (b) Single discount for 20% and 15%

$$= -20 - 15 + \frac{300}{100} = -32\%$$

$$MP \times 68\% - MP \times 65\% = 504$$

$$MP \times 3\% = 504$$

$$MP = 16800$$

49. (d) $\frac{MP}{CP} = \frac{(100 + P)\%}{(100 - D)\%}$
 $= \frac{MP}{CP} = \frac{105}{90}$
 $MP = \frac{105 \times 300}{90} = \text{Rs } 350$
- | | |
|----|----|
| MP | SP |
| 10 | 9 |
| 20 | 19 |
50. (a)

5000	4104
------	------

 $SP = \text{Rs. } 98496$
 $MP = \frac{98496}{4104} \times 5000 = \text{Rs. } 1,20,000$
51. (b) $\frac{MP}{CP} = \frac{100 + P\%}{100 - D\%} \Rightarrow \frac{MP}{CP} = \frac{116}{90}$
 $MP = \frac{648 \times 116}{90} = \text{Rs. } 835.20$
52. (d) ATQ,
 $530 \times \frac{17}{20} \times \frac{(100 - x)}{100} = 396.44$
 $\Rightarrow 53 \times 17 \times (100 - x) = 79288$
 $\Rightarrow (100 - x) = \frac{79288}{53 \times 17}$
 $\Rightarrow (100 - x) = 88$
 $\Rightarrow x = 12\%$
53. (a)

MP	SP
1000	680

Discount% = 32
ATQ, $20 + x - \frac{20 \times x}{100} = 32$
 $\Rightarrow 100 + 5x - x = 160$
 $\Rightarrow 4x = 60$
 $\Rightarrow x = 15\%$
54. (c) ATQ,
 $\Rightarrow 800 \times \frac{3}{4} \times \frac{(100 - x)}{100} = 540$
 $\Rightarrow 600 - 6x = 540$
 $\Rightarrow 6x = 60 \Rightarrow x = 10\%$
Thus, second discount = 10%
55. (b) Given,
MP of the 8 shirts = 9600
MP of the 1 shirt = Rs. 1200
Discount = 15%
 $SP \text{ of 1 shirt} = 12000 \times \frac{85}{100}$
= Rs. 1020
Shirts can be bought with Rs 5100
 $= \frac{5100}{1020} = 5$
56. (b) Rebate on each T.V set
= 40% of 6000 = Rs. 2400
To get the rebate of total Rs. 26,400 he has bought the number
of T.V set = $\frac{26,400}{2400} = 11$
57. (d)

MP	SP
10	9
25	21
4	3
1000	567

- Required discount %
 $= \frac{(1000 - 567)}{1000} \times 100\% = 43.3\%$
58. (a) $CP = \frac{427.70}{130\%} \times 100\% = 329$
 $MP = \frac{329}{70\%} \times 100\% = 470$
MP of the article = Rs. 470
59. (b) ATQ,
 $\Rightarrow 7200 \times \frac{100 - x}{100} \times \frac{100 - x}{100} = 5512.5$
 $\Rightarrow \left(\frac{100 - x}{100}\right)^2 = \frac{5512.5}{7200}$
 $\Rightarrow \frac{100 - x}{100} = \sqrt{\frac{5512.5}{7200}}$
 $\Rightarrow \frac{100 - x}{100} = \frac{7}{8}$
 $\Rightarrow x = \frac{100}{8} = 12.5\%$
60. (d) ATQ,
 $\Rightarrow 20 + x - \frac{20 \times x}{100} = 25.76$
 $\Rightarrow 20 + x - \frac{x}{5} = 25.76$
 $\Rightarrow \frac{4x}{5} = 5.76$
 $\Rightarrow 4x = 28.80$
 $\Rightarrow x = 7.2\%$
61. (d) $MP = \frac{180}{80\%} \times 100\% = 225$
 $\frac{MP}{CP} = \frac{100 + P\%}{(100 - D)\%}$
 $\Rightarrow \frac{225}{CP} = \frac{(100 + 20)\%}{100\%}$
 $\Rightarrow \frac{225}{CP} = \frac{120}{100}$
 $\Rightarrow CP = 187.50$
62. (c)

MP	
100	
80%	10% discount
CP = 80	SP = 90

 $P\% = \frac{(90 - 80)}{80} \times 100$
 $= \frac{10}{80} \times 100\% = 12\frac{1}{2}\%$
63. (d) Effective discount
 $= 5 + 20 - \frac{5 \times 20}{100} = 24\%$
MP = 100%
 $P\% = M - D - \frac{M \times D}{100}$
 $= 100 - 24 - \frac{100 \times 24}{100}$
 $= (76 - 24) = 52\%$

SMART APPROACH:-

CP = 100
MP = 200
 $SP = 200 \times \frac{19}{20} \times \frac{4}{5} = 152$
P% = 52

64. (c) MP = 100
 $SP = 100 \times \frac{90}{100} = 90$
 $CP = \frac{90}{125\%} \times 100\% = 72$
New SP = $100 \times \frac{(100 - 25)\%}{100} = 75$
Profit% = $\frac{(75 - 72)}{72} \times 100\%$
 $= \frac{3}{72} \times 100\% = 4\frac{1}{6}\%$
- Note:** Here applying $\frac{100 + P\%}{100 - D\%}$ formula can be tricky because this approach involves lengthy calculation you can solve it taking ratios as well.
- Ratio Method**
- | | | |
|----|----|----|
| MP | SP | CP |
| 10 | 9 | |
| | 5 | 4 |
| 50 | 45 | 36 |
- after giving 25% discount on MP
SP = 50 - 12.5 = 37.5
- New P% = $\frac{1.5}{360} \times 100\% = 4\frac{1}{6}\%$

65. (b) Gain = 20% = $\frac{20}{100} \rightarrow$ Profit
SP = 120
CP = 100
- Discount, 25% = $\frac{25}{100} \rightarrow$ Discount
SP = (100 - 25) = 75
 $\frac{120}{75} \times 100 = 160$ (MP)
CP = 100 $\uparrow 20\%$
New CP = 120
Profit = 20%
SP = 144
Discount% = $\frac{(160 - 144)}{160} \times 100\%$
 $= \frac{16}{160} \times 100\% = 10\%$

SMART APPROACH:-

MP	SP	CP
4	3	
	6	5
8	6	5

If CP is increased by 20% then CP = 6
for the same P% $SP = 6 \times \frac{6}{5} = 7.2$
Required D% = $\frac{0.8}{8} \times 100 = 10\%$



SIMPLE INTEREST

04

1 लभ और ह

1. Rajesh invested ₹10,000 by dividing it into two different investment schemes, A and B, at simple interest rates of 8% and 10%, respectively. If the total interest earned in 2 years is ₹1,680, the amount invested in scheme A is:

किसी का 10 हजार रुपय के दो भागों में 8% और 10% की दर पर निवेश किया गया। 2 वर्षों में कुल ब्याज ₹1,680 है, तो निवेश A में निवेशित राशि क्या है?

SSC CPO 03/10/2023 (Shift-01)

- (a) ₹4,000 (b) ₹2,000
(c) ₹6,000 (d) ₹8,000
2. If an amount of ₹80 becomes ₹96 in 2 years in a bank account which gives simple annual interest, then an amount of ₹62,000 will become _____ after 5 years.

₹80 की राशि 2 वर्षों में ₹96 हो गई। यदि वही दर 5 वर्षों के लिए लागू रहे, तो ₹62,000 की राशि क्या हो जाएगी?

SSC CPO 03/10/2023 (Shift-02)

- (a) ₹93,000 (b) ₹84,600
(c) ₹82,400 (d) ₹88,200
3. Ramesh borrowed some money at rate of 5% per annum for the first four years, 8% per annum for the next six years, and 12% per annum for the period beyond ten years. If the total interest paid by him at the end of twelve years is Rs.9,016, then find the money borrowed by Ramesh.

रमेश ने कुछ पैसे 5% वार्षिक दर पर 4 वर्षों के लिए, 8% वार्षिक दर पर 6 वर्षों के लिए, और 12% वार्षिक दर पर 2 वर्षों के लिए उधार लिए। कुल ब्याज ₹9,016 है, तो उधार लेने की राशि क्या है?

SSC CPO 03/10/2023 (Shift-3)

- (a) Rs.9,800 (b) Rs.9,616
(c) Rs.9,816 (d) Rs.9,016

4. Anandi bought a smart watch from an electronic store for Rs.4,400. Since she had less money, she paid Rs.2,000 for down payment and the shopkeeper offered her an alternative to pay Rs.2,440 after 1 month. Find the rate of interest being charged at simple interest by the shopkeeper in this instalment option?

आनंदी एक स्मार्ट वॉच 4,400 रुपये में खरीदी। चूंकि उसके पास कम पैसे थे, उसने 2,000 रुपये का निश्चय भुगतान किया और दुकानदार ने उसे 1 माह के बाद 2,440 रुपये में वॉच खरीदने का विकल्प प्रस्तावित किया। इस विकल्प में दुकानदार द्वारा चार्ज की गई साधारण ब्याज की दर क्या है?

SSC CPO 04/10/2023 (Shift-01)

- (a) 15% (b) 10%
(c) 20% (d) 22%
5. Ramesh borrowed ₹15,000 at a certain rate of simple interest from a bank. He repaid (the principal but not interest) ₹6,000 after 5 years, and after 5 more years he paid ₹18,600 and settled his account. Find the rate of simple interest per annum.

रमेश ने एक बैंक से ₹15,000 की दर पर साधारण ब्याज पर उधार लिया। 5 वर्षों के बाद, उसने ₹6,000 (प्रधान्यता पर ब्याज नहीं) का भुगतान किया। 5 वर्षों के बाद, उसने ₹18,600 का भुगतान किया और अपना खाता बंद कर दिया। वार्षिक साधारण ब्याज की दर क्या है?

SSC CPO 04/10/2023 (Shift-02)

- (a) 10% (b) 8%
(c) 12% (d) 6%
6. Kanchan lent Rs.10,000 for 2 years and Rs.5,000 for 4 years at the same rate of simple interest. If the total interest received by Kanchan is Rs.2,000, then what was the rate of interest?

कंचन ने ₹10,000 को 2 वर्षों के लिए और ₹5,000 को 4 वर्षों के लिए उसी दर पर साधारण ब्याज पर उधार दिया। कुल ब्याज ₹2,000 है, तो दर क्या है?

SSC CPO 04/10/2023 (Shift-3)

- (a) 4% (b) 2%
(c) 3% (d) 5%

7. What annual instalment (in Rs) will discharge a debt of Rs 9,429 due in three years at 12.25% simple interest per annum?

₹9,429 की राशि को 12.25% वार्षिक साधारण ब्याज पर 3 वर्षों में चुका देने के लिए वार्षिक किश्त (रुपयों में) क्या होनी चाहिए?

Note: Instalments will be paid at the end of Year 1, Year 2 and Year 3.

प्रति वार्षिक किश्त (रुपयों में) क्या होनी चाहिए ताकि ₹9,429 की राशि 12.25% वार्षिक साधारण ब्याज पर 3 वर्षों में चुका दी जा सके?

SSC CPO 05/10/2023 (Shift-01)

- (a) 2800 (b) 2700
(c) 2840 (d) 2760
8. A sum amounts to Rs.7,656 in 4 years and to Rs.8,120 in 5 years at a certain simple interest rate per cent per annum. The rate of interest is:

एक राशि 4 वर्षों में ₹7,656 हो गई और 5 वर्षों में ₹8,120 हो गई। वार्षिक साधारण ब्याज की दर क्या है?

SSC CPO 05/10/2023 (Shift-2)

- (a) 4% (b) 3%
(c) 7% (d) 8%
9. In a store, Arun has two options to buy a mobile phone, either he can pay the full amount of Rs.2,500 or he may buy at an instalment scheme, i.e. Rs.520 in down payment and four equal instalments, rate of interest being charged at 25% p.a. simple interest. Arun buys a mobile phone on the instalment scheme. What is the monthly instalment for Arun?

Selected प्रSelection ता लअँ 37

- (a) 8% (b) 8.5%
(c) 9% (d) 9.5%
19. A certain sum (in Rs.) is invested at simple interest at $x\%$ p.a. for 5 years. Had it been invested at $(x + 5)\%$ p.a., the simple interest would have been Rs. 9,200 more than the earlier one. What is the sum?
- उन रुप प (लर 21 कि क षर षरन के $x\%$ क षर
क की क इत क षर शि शि क षर षरन रुप उर प. ी क
प त क त क षर त प शर $(x + 5)\%$ षरन षर क षर
इत क षर शि शि प. ी क प त क स क षर ली क की क
इत क षर षरन षरन षर षर षर षर षर षर षर
न क षर षर 21 कि क प ल षरन
- SSC CPO 12/12/2019 (Shift-01)**
- (a) Rs. 36,800 (b) Rs. 36,400
(c) Rs. 35,800 (d) Rs. 40,000
20. A certain sum of money amounts to Rs. 8,928 in two years and to Rs. 10,224 in $3\frac{1}{2}$ years, both at simple interest. The rate of interest per annum is:
- उन रुप प (लर 21 कि क क षर क की क इत क
शि शि के षर षर ज) षर षर क $3\frac{1}{2}$ षर षर
हर ज 10 षर क क स क षर क षर षर इत क षर शि क
न षरन
- SSC CPO 12/12/2019 (Shift-02)**
- (a) 12% (b) 10%
(c) 9% (d) 15%

21. Two equal sums (in Rs.) are lent at 8% and 4% simple interest p.a. respectively at the same time. The first sum is received 2 years earlier than the other and the amount received in each case is Rs. 14,500. Each sum is:
- के प कि शि 21 कि क षर षर षर क षर षर
षर क षर क की क इत क षर शि शि षरन रु षर
त श शि 2 क षर षर स क षर षर षर षर 21 कि क
रु षर 21 कि क षर षर षर षर षर षर स क षर
न षर क शि शि 21 कि क षर षर षर षर क षर
21 कि क षर षर षर षर षर शि शि 21 कि क षर
न षरन
- SSC CPO 13/12/2019 (Shift-01)**
- (a) Rs. 12,800 (b) Rs. 12,500
(c) Rs. 13,200 (d) Rs. 12,000
22. Two equal sums are lent at 10% and 8% simple interest p.a. respectively, at the same time. The first sum is received 2 years earlier than the second one and the amount received in each case was Rs. 36,900. Each sum was:
- के प कि शि 21 कि क षरन के षर क षर षर
षर क षर क की क इत क षर शि शि षरन रु षर
त श शि 2 क षर त क स क षर षर षर षर षर
रु षर 21 कि क षर षर षर षर षर स क षर
न षर क शि शि 2 क षर षर षर 21 कि क षर
षर शि शि षर षर षर षर
- SSC CPO 13/12/2019 (Shift-02)**
- (a) Rs. 21,500 (b) Rs. 20,500
(c) Rs. 20,200 (d) Rs. 18,100

23. Sudeep invested $\frac{1}{8}$ of a certain sum at 5% p.a. for two years and $\frac{3}{5}$ of the sum at 6% p.a. for two years and the remaining at 10% p.a. for two years. If the total interest received is Rs. 1,674 then the total sum invested is:
- द श षरन रुप प (लर 21 कि क न क $\frac{1}{8}$ षर
क षर क षर इत क षर शि शि 0 षर षर षर उर प. ी क
प त क षर क षर 21 कि क न क $\frac{3}{5}$ षर षर अ
क षर इत क षर शि शि 0 षर षर षर उर प. ी क
प त क षर के 21 कि क न के षर षर क षर
इत क षर शि शि 0 षर षर षर उर प. ी क प त क षर
षर क षर षर इत क षर षर षर षर षर
प. ी क षर षर षर 21 कि क प ल षरन
- SSC CPO 09/12/2019 (Shift-01)**
- (a) Rs. 13,000
(b) Rs. 12,000
(c) Rs. 10,500
(d) Rs. 12,500

ANSWER KEY

1.(d)	2.(a)	3.(a)	4.(c)	5.(b)	6.(d)	7.(a)	8.(a)	9.(d)	10.(b)
11.(d)	12.(d)	13.(d)	14.(a)	15.(a)	16.(b)	17.(d)	18.(d)	19.(a)	20.(a)
21.(b)	22.(b)	23.(b)							

SOLUTIONS

1. (d)

$$SI = \frac{P \times R \times T}{100}$$

I II

$$A \times \frac{8 \times 2}{100} + B \times \frac{10 \times 2}{100} = 1680$$

$$16A + (10000 - A) 20 = 168000$$

$$\Rightarrow 4A = 200000 - 168000$$

$$A = \frac{32000}{4} = \text{Rs.} 8000$$

Alternate method:

SI for 1 year = Rs. 840

$$SI = \frac{10000 \times 8 \times 1}{100} = \text{Rs.} 800$$

Difference in SI = 840 - 800 = Rs. 40

This difference in SI is due to difference in rate of interest.

$$(10 - 8)\% = \text{Rs. } 40$$

$$100\% = \text{Rs. } 2000$$

Amount invested in scheme A = 10000 - 2000 = Rs. 8000

2. (a)

$$SI = 96 - 80 = \text{Rs.} 16$$

$$\therefore R = \frac{16 \times 100}{80 \times 2} = 10\%$$

Now,

$$\text{Eff. Rate} = (10\% \times 5) = 50\%$$

$$\therefore \text{Amount} = \frac{150}{100} \times 62000$$

$$= \text{Rs.} 93000$$

3. (a)

Let, sum borrowed be P.
ATQ,

$$P \left[\frac{5 \times 4}{100} + \frac{8 \times 6}{100} + \frac{12 \times 2}{100} \right] = 9016$$

$$P = \frac{901600}{20 + 48 + 24} = 9800$$

4. (c)

Amount on instalment = 4400 - 2000 = 2400

$$\text{Interest} = 2440 - 2400$$

$$= \text{Rs.} 40 \text{ for 1 month}$$

$$\therefore R = \frac{40}{2400} \times 100 \times 12$$

$$= \frac{5}{3} \times 12 = 20\%$$

5. (b)

$$P = 15,000,$$

$$I = 18600 + 6000 - 15000 = 9600$$

after 5 yrs amount remaining = 15000 - 6000 = 9,000

Let rate be R%

$$\Rightarrow \frac{15000 \times R \times 5}{100} + \frac{9000 \times R \times 5}{100} = 9600$$

$$\Rightarrow (750 + 450) R = 9600$$

$$\Rightarrow R = \frac{9600}{1200} = 8\%$$

6. (d)

$$SI = \frac{P \times R \times T}{100}$$

$$R \left[\frac{10,000 \times 2}{100} + \frac{5000 \times 4}{100} \right] = 2000$$

$$R[200 + 200] = 2000$$

$$R = 5\%$$

7. (a)

$$\text{Installment} = \frac{A \times 100}{100t + \frac{Rt(t-1)}{2}}$$

$$= \frac{942900}{300 + 36.75 \frac{(2)}{2}}$$

$$= \frac{942900}{336.75} = \frac{1257200}{449}$$

$$= \text{Rs.} 2800$$

Alternate Method:

$$\text{Amount} = 100\% + (100 + 12.5)\%$$

$$+ (100 + 12.5 + 12.5)\%$$

$$= 336.75\%$$

$$336.75\% = 9429$$

$$100\% = \text{Rs. } 2800$$

8. (a)

$$\text{Interest for 1 year} = 8120 - 7656$$

$$= \text{Rs.} 464$$

$$\text{Interest for 4 years} = 464 \times 4$$

$$= 1856$$

$$\therefore \text{Principal} = 7656 - 1856$$

$$= 5800$$

$$\therefore R = \frac{464 \times 100}{5800} = 8\%$$

9. (d)

$$2500 - 520 = 1980$$

Amount for installment =

$$1980 + 1980 \times 4 \times \frac{25}{1200}$$

$$= 1980 + 165 = 2145$$

$$\therefore \text{Installment} = \frac{214500}{400 + \frac{4}{2} \times \frac{25}{12} \times (3)}$$

$$= \frac{214500 \times 2}{825} = \frac{429000}{825} = \text{Rs.} 520$$

10. (b)

$$\text{Total SI} = 20400 - 12000 = \text{Rs. } 8400$$

SI for 1 year = 10% of 12000 = Rs. 1200

$$\text{Time} = \frac{8400}{1200} = 7 \text{ years}$$

11. (d)

$$\text{Rate difference} = 17\frac{1}{2}\% - 11\%$$

$$= 6\frac{1}{2}\%$$

$$\text{Principle, } 100\% = 1071.2 \times \frac{2}{13} \times 100$$

$$= \text{Rs. } 16480$$

12. (d)

$$\text{Rate difference} = 17\frac{1}{2}\% - 11\%$$

$$= 6\frac{1}{2}\%$$

$$\text{Principle, } 100\% = 1071.2 \times \frac{2}{13} \times 100$$

$$= \text{Rs. } 16480$$

Now,

$$SI = \frac{16480 \times 10 \times 5}{100} = \text{Rs. } 8240$$

13. (d)

$$\text{ATQ, } A \times 2 \times \frac{15}{100} = B \times \frac{4 \times 15}{100}$$

$$\Rightarrow \frac{A}{B} = \frac{2}{1}$$

$$3 \text{ unit} = 27000$$

- A, 2 unit = 18000
B, 1 unit = 9000
Total Interest,
$$= 18000 \times \frac{2 \times 15}{100} + 9000 \times \frac{4 \times 15}{100}$$
$$= 5400 + 5400 = 10800$$
14. (a)
Total SI of 7 years = 20400 - 12000
= 8400
$$\text{SI of 1 year} = \frac{8400}{7} = 1200$$
$$1200 = \frac{12000 \times 1 \times R}{100}$$
$$R = 10\%$$
15. (a)
ATQ, $\frac{A \times 15 \times 2}{100} = \frac{B \times 15 \times 4}{100}$
$$\Rightarrow \frac{A}{B} = \frac{2}{1}$$
$$3 \text{ unit} = 36000$$
$$A = 2 \text{ unit} = 24000$$
$$\text{SI on A} = 24000 \times \frac{15 \times 2}{100} = 7200$$
16. (b)
Time = $3\frac{1}{2}$ year
Rate = $y\%$
Had it been invested at $(y + 4)\%$ per annum at simple interest
It fetched Rs more = 4452 as interest
$$\text{sum} = \frac{4452}{4 \times \frac{7}{2}} \times 100\%$$
$$= \frac{4452 \times 2 \times 100}{4 \times 7} = \text{Rs. } 31800$$

17. (d)
Total interest
$$= \left(\frac{7x}{2} \right) + 2 \left[\left(\frac{7}{2} \right) \times (x + 2) \right] \% \text{ of } 18600$$
$$= \left[\left(\frac{7x}{2} \right) + (7x + 14) \right] \% \text{ of } 18600$$
$$= \left(\frac{21x + 28}{2} \right) \% \text{ of } 18600$$
$$\text{ATQ, } (21x + 28) \text{ of } 93 = 23110.5$$
$$\Rightarrow 21x + 28 = 248.5$$
$$\Rightarrow x = 10.5$$
$$\text{Rate of second year} = (x + 2)\%$$
$$= 12.5\%$$
18. (d)
Interest in 1 year = $\frac{7650}{3} = 2550$
$$\Rightarrow \frac{10500 \times x \times 1}{100} + \frac{13500 \times (x + 2) \times 1}{100}$$
$$= 2550$$
$$\Rightarrow 105x + 135x + 270 = 2550$$
$$\Rightarrow 240x = 2280$$
$$\Rightarrow x = 9.5\%$$
19. (a)
Required Sum = $\frac{9200}{(5 \times 5)\%} \times 100\%$
$$= \frac{9200}{25\%} \times 100\% = \text{Rs. } 36800$$
20. (a)
SI for $\frac{3}{2}$ years = 10224 - 8928
= 1296
SI for 2 years = $\frac{1296}{3} \times 2 \times 2$
= 1728

$$\text{Principal} = 8928 - 1728 = 7200$$

$$R = \frac{100 \times 1728}{7200 \times 2} = 12\%$$

21. (b)
Time for the 1st sum be T years
Time for the 2nd sum be $(T + 2)$ years
ATQ,
 $\Rightarrow 8T\% \text{ of } P = 4(T + 2)\% \text{ of } P$
$$\Rightarrow 8T = 4T + 8$$
$$\Rightarrow T = 2 \text{ years}$$

Now,
Amount = 14500, $R = 8\%$,
 $T = 2$ years
Principal = $\frac{14500}{116\%} \times 100\%$
= Rs. 12500
22. (b)
 $R = 10\% \quad 8\%$
 $T = \frac{8}{80} \quad \frac{10}{80}$
Each sum = $\frac{36900}{(100 + 80)\%} \times 100\%$
= Rs 20500
23. (b)
Let, sum = 40
Case-I
$$\text{SI} = \frac{5 \times 5 \times 2}{100} = \frac{1}{2}$$

Case-II
$$\text{SI} = \frac{24 \times 6 \times 2}{100} = \frac{72}{25}$$

Case-III
$$\text{SI} = \frac{11 \times 10 \times 2}{100} = \frac{11}{5}$$

Total SI = $\left(\frac{1}{2} + \frac{72}{25} + \frac{11}{5} \right) = \frac{279}{50}$
Total interest = Rs 1674 (given)
Invested sum = $1674 \times \frac{50}{279} \times 40$
= Rs. 12000





COMPOUND INTEREST

05

प्र सिलः अ

- Jonathan had borrowed a sum of money 3 years ago at 10% interest per annum compounded annually for a 5-year period, with the amount to be paid at the end of the period being ₹1,61,051. However, there is no pre-payment penalty and Jonathan has received some bonus payment now, with which he has decided to clear his debt. How much does Jonathan have to pay now to clear his debt?

फ़िकिकेरी सा शहरका खसहकैवश । प हया
 व कर्कशन शर्दिके बरद २ शहकैवशू बर्करी
 ई शर्न शै श क्मक लर हरकैव शयउउश ०८ क
 खे शू ड्र व हय शै सव अर श प्रकीअरै
 किकेसहकै श क्मक शरद७२% लर केश ककै %
 क्मकन प्रकीअरै इ न शउ (नसअरनीसा) रशी
 क्मक व कर्क फ़िकिकेरी क्मक प्रकै शर खकैद
 प्रकीअरैउकअं च कर्क शरद२५० डी सव नी क८ दक
 १८ कैसै कन अउककयै बकं ए फ़िकिकेरी क्मक
 व प्रकैयै अ क प्रकीअरै 'ी कं कीक

SSC CPO 03/10/2023 (Shift-01)

- (a) ₹1,33,100 (b) ₹1,33,200
(c) ₹1,33,000 (d) ₹1,32,900
2. A sum of ₹1,00,000 was taken from a bank at the rate of 7% p.a to be compounded annually for 5 years. Calculate the compound interest. (Closest to a ₹)

जै ए व्हेर ए डस रद% % ए' ए' कसक 2
हकैकश। प हया रू बर्कशै' ए' ए' डस रद हरक
स यडउर 08 कश खे ए' ए' कसक बर्कशै'
दिककहकैकश। प हया एव कर्कशन शै' शिक्मे
ए। प हया ए बर्कशै' कशै' ए' बस

SSC CPO 03/10/2023 (Shift-02)

- (a) 40,587 (b) 40,000
(c) 20,963 (d) 40,255
3. What is the compound interest on a sum of Rs.25,000 after three years at a rate of 12 percent per annum interest compounded yearly?

धल% . ए णनबसै ' ए क्कक्क नं ए दधस उयक्कक्क
हक्कक्कैशू बर्कशै ' ए ई ए द्दस ओ ए हरक्कक्क
। प द्दस ए बर्कशैयै ओ क्क क्कक्क

SSC CPO 03/10/2023 (Shift-3)

- (a) Rs.10,123.20
(b) Rs.9,824.00
(c) Rs.9,956.86
(d) Rs.10,520.00
4. A sum of money was invested at 10% interest per year, compounded half-yearly, for 18 months. If the amount payable on maturity was ₹64,827, what was the sum invested?

जो शर्ही कमको काउन्टरहरूकाद 2% बर्केशन %
वर्षात कमको रुनुइ दुसरा दुवको अर्को असंज्ञा
द-शर्ही को सयउत्तरशय हसकैय बर्कबिक का
बर्केशनयनथहअर्कन शर्बर् कमकर 4% धु श के
अस्यो हसकै शर्षी कमकथबको के

SSC CPO 04/10/2023 (Shift-01)

- (a) ₹55,600 (b) ₹56,500
(c) ₹56,800 (d) ₹56,000
5. Peter invested a certain sum of money in a scheme paying 10% simple interest per annum, while Rachel invested half of the sum that Peter invested in a scheme paying 10% interest per annum compounded annually. Also, while Peter invested for 2 years, Rachel invested for 3 years. If the difference in the interest earned by Peter and Rachel was ₹897, what was the sum that Rachel had invested?

ने) शी सद २ हकौक श दुक कदकू बकी श इस
हकौ श जै श बकी कन सने श ये मा अर कनक
क ये हसकयै बकष खैय श सखरी सहकौक
। प हया श व कनन श दिके बरद २ हकौक
बकी श ई श हकौ श जै श बकी कन सने) श दुस
व क श कनक क ये हसकयै बकष ने) शी शध
हरकौ सयदुजय ये हसकयै बकष अर सखरी सा
हरकौ सयदुजय ये हसकयै बकष बरद शी सनक
वर्य जू बकी कन सने-६ श क व अश कष अर
सखरी सय अं श कनक क ये हसकयै बकष क

SSC CPO 04/10/2023 (Shift-02)

- (a) ₹12,900
(b) ₹13,000
(c) ₹13,100
(d) ₹12,960

6. A sum of money amounts to Rs.1,200 in 2 years and becomes Rs.1,260 in 3 years at compound interest, when interest is compounded annually. What is the rate of compound interest per annum?

जै एही काकाधरका सहभा. एनबस का को
 एवका. प हया पू बकी रन श शहरका सहभा?
 एनबस का को ए भा खू बकी शहरका ए रन शहर
 दुनका अ काका ए. प हया पू बकी शै शहरका
 ई शहरका ?

SSC CPO 04/10/2023 (Shift-3)

- (a) 6% (b) 3%
- (c) 5% (d) 7%

7. If interest be compounded half-yearly, then find the compound interest on Rs 8,000 at 20% p.a. for 1 year.

बन्धू बर्क है ' शर्दिकेकव ष हकैकै श। प हया
व कर्कन श है ' शर्कोश ष अकैक श % . है '
' कर्कन श ध 2 श हकैकै है ' शर् श द्दसद श हरका
' क। प हया श बर्क श. कर् है ' स

SSC CPO 05/10/2023 (Shift-01)

- (a) Rs 1685 (b) Rs 1680
(c) Rs 1675 (d) Rs 1690

8. Find the amount (integral value only) if a sum of Rs.6,500 is being borrowed at 10% interest per annum for 2 years if interest is compounded half-yearly.

[illegible]

SSC CPO 05/10/2023 (Shift-2)

- (a) Rs.7,900 (b) Rs.8,150
(c) Rs.8,250 (d) Rs.7,650

9. Find the difference between the simple interest and the compound interest payable annually on a sum of ₹ 6,500 at 7% per annum for 3 years. (Correct to two decimal places.)

ये ढे शर्ती कमर्न श 2 शहकौक शई श 2 सध
हरकौ क ढककौक बकी ए नवस 4% श ए
बकी शै श दिकेक हकौक श। प हया श व क क
न शै ' असं प्रशुद्ध केश कमर्न श 2 केशव हय
सय 2 श 2 शै शई श 2 सध। प हया शू बकी
चनवस सश. कशै ' स
चयै) अ श 5 ससदर अ स

SSC CPO 25/11/2020 (Shift-2)

- (a) 13,061 (b) 14,671
(c) 8,100 (d) 12,751

21. At what percentage rate compound interest compounded annually for a sum of Rs. 40,000 will amount to Rs. 44,100 in two year?
नवस 4% शै श 2 शर्ती कमर्न 2 सधसक
ई शन श 2 ससदर सनवस 4% श कौक शी क
बकी शहकौक श न 2 सध। प हया शै बकी कक

SSC CPO 09/12/2019 (Shift-1)

- (a) 5 (b) 2
(c) 4 (d) 7.5

22. A sum of money becomes Rs. 35,680 after 3 years and Rs. 53,520 after 6 years at a certain rate percentage p.a. interest compounded yearly. What is the compound interest on the same sum in the first case? (Your answer should be nearest to integer)
शै शये या अशर्ती कमर्न शहकौक श न 2 सध। प हया
शै श 3 शै कसहकौक शये या अशर्ती कमर्न शू बकी शई शन श
हरकौ सवक श ल 2 श व क श 2 शहरकौ सवक श
ल 2 श कौक शै ए न खस कखस शू ढे
शर्ती कमर्न श प हया शू बकी श कौक शै श 2 सधसक कौ क
09 सनदक शै स 2 सधसक शै) कस। क स

SSC CPO 09/12/2019 (Shift-2)

- (a) Rs. 11,983 (b) Rs. 11,894
(c) Rs. 10,842 (d) Rs. 11,938
23. What is the compound interest on a sum of Rs. 37,500 for $1\frac{1}{3}$ years at a rate of 12% p.a. if the interest is compounded 8 monthly?

शू शू शू शै श शर्ती कमर्न श 2 सध शहकौक

। प हया शू बकी शई श 2 सध $1\frac{1}{3}$ शहरक सये अ क

। प हया शू बकी शन 2 सध कौक शवक शू बकी शरू कौक
व क कस श। प हया शै बकी कक ए

SSC CPO 11/12/2019 (Shift-1)

- (a) Rs. 6,440 (b) Rs. 6,240
(c) Rs. 6,420 (d) Rs. 6,448

24. The compound interest amounts on a certain sum at a certain rate percentage p.a. for the second year and third year are Rs. 3,300 and Rs. 3,630 respectively. What is the amount of the same

sum at the same rate in $2\frac{1}{2}$ years interest compounded yearly?

शै शये या अशर्ती कमर्न सय 2 श बकी शै श 2 शै
ये या अशर्ती कमर्न शई शन श 2 सध ससदर कस अ 2 सधसक
न सनक शै कसहकौक। प हया शू बकी शन मस श

1% श व क श श 2 श ए 2 $\frac{1}{2}$ शहरक श 2 श

शै कमर्न 2 शू बकी शई शन शै अं श कौक शै शवक
शू बकी शहकौक श न 2 सध। प हया शै बकी कक ए

SSC CPO 11/12/2019 (Shift-2)

- (a) Rs. 37,215 (b) Rs. 36,300
(c) Rs. 38,115 (d) Rs. 36,000

25. A sum of Rs. 5,000 amount to Rs. 7,200 in 8 years at a certain rate percent p.a. interest compounded yearly. What will be the compound interest on a sum of Rs. 6,550 in 4 years at the same rate of interest?

ल% श शै श 2 शै शर्ती कमर्न शै शये या अ
हकौक शू बकी शई शन 8 सधसक शन शहरक शू शू
प श कौक शै शू ढे शू बकी शई शन श 4 शहरक शू शू
श 2 सध शै श शर्ती कमर्न शै अ क। प हया
शू बकी शन 4 सध कौक

SSC CPO 12/12/2019 (Shift-1)

- (a) Rs. 1,290 (b) Rs. 1,285
(c) Rs. 1,415 (d) Rs. 1,310

26. The compound interest on a certain sum invested for 2 years at 10% per annum is Rs. 1,522.50, the interest being compounded yearly. The sum is:

इकहकौ सय 2 श 2 शहकौक श। प हया शू बकी
ई शन शये हसकौ शै श 2 शये या अशर्ती कमर्न
नक शै कसहकौक। प हया शू बकी श 2 सधसक शू
शै शये शू बकी शहकौक श न 2 सध। प हया शै बकी कक
ए 2 सध शै कमर्न कौक शै शै शै

SSC CPO 13/12/2019 (Shift-1)

- (a) Rs. 7,250 (b) Rs. 7,200
(c) Rs. 7,500 (d) Rs. 7,000

27. A sum of Rs. x amount to Rs. 12,777.60 in 2 years at 15% p.a., when the interest is compounded eight-monthly. The value of x is.

प श 2 शै श 2 शै शर्ती कमर्न 2 सधसक शू बकी शई
न श 2 सधसक स 2 सधसक शू शै श कौक शै 15%
शै शये शू बकी शव क (न कौक श व क कस श। प हया
शै बकी कक ए 2 सध क कौक शै शै शै

SSC CPO 13/12/2019 (Shift-2)

- (a) Rs. 9800 (b) Rs. 10400
(c) Rs. 10200 (d) Rs. 9600

ANSWER KEY

1.(a)	2.(d)	3.(a)	4.(d)	5.(b)	6.(c)	7.(b)	8.(a)	9.(b)	10.(a)
11.(a)	12.(a)	13.(d)	14.(d)	15.(b)	16.(a)	17.(c)	18.(c)	19.(b)	20.(a)
21.(a)	22.(b)	23.(b)	24.(c)	25.(a)	26.(a)	27.(d)			

SOLUTIONS

1. (a)

$$\text{Principal} = \left(\frac{10}{11}\right)^5 \times 161051$$

$$= \frac{100000}{161051} \times 161051 = 100000$$

Amount after 3 years

$$= \frac{11}{10} \times \frac{11}{10} \times \frac{11}{10} \times 100000$$

$$= \text{Rs. } 133100$$

2. (d)

$$\begin{array}{l} \text{I year} \rightarrow 1 \\ \text{II year} \rightarrow 1 \quad 1 \\ \text{III year} \rightarrow 1 \quad 2 \quad 1 \\ \text{IV year} \rightarrow 1 \quad 3 \quad 3 \quad 1 \\ \text{V year} \rightarrow 1 \quad 4 \quad 6 \quad 4 \quad 1 \\ \quad \quad \downarrow \quad \downarrow \quad \downarrow \quad \downarrow \\ \quad \quad 5 \quad 10 \quad 10 \quad 5 \quad 1 \end{array}$$

$$100000 \times \frac{7}{100} = 7000$$

$$7000 \times \frac{7}{100} = 490$$

$$490 \times \frac{7}{100} = 34.3$$

$$34.3 \times \frac{7}{100} = 2.401$$

$$2.401 \times \frac{7}{100} = 0.16807$$

$$\begin{aligned} \text{CI} &= 5 \times 7000 + 10 \times 490 + 10 \times 34.3 + 5 \times 2.401 + 1 \times 0.16807 \\ &= 35000 + 4900 + 343 + 12.005 + 0.16807 \\ &= \text{Rs. } 40,255.1731 \sim \text{Rs. } 40,255 \end{aligned}$$

Alternate Method:

$$\text{Amount after I}^{\text{st}} \text{ year} = 100000 \times$$

$$\frac{107}{100} = 107000$$

$$\text{Amount after II}^{\text{nd}} \text{ year} = 107000 \times$$

$$\frac{107}{100} = 114490$$

$$\text{Amount after III}^{\text{rd}} \text{ year} = 114490 \times$$

$$\frac{107}{100} = 122504.3$$

$$\text{Amount after IV}^{\text{th}} \text{ year} = 122504.3$$

$$\times \frac{107}{100} = 131079.6$$

$$\text{Amount after V}^{\text{th}} \text{ year} = 131079.6$$

$$\times \frac{107}{100} = 140255.17$$

$$\begin{aligned} \text{CI} &= 140255.17 - 100000 \\ &= 40255.17 \sim \text{Rs. } 40255 \end{aligned}$$

3

(a)

$$P = 25000$$

$$R = 12\%, t = 3 \text{ yrs.}$$

$$\text{I year} \rightarrow 1$$

$$\text{II year} \rightarrow 1 \quad 1$$

$$\begin{array}{c} \text{III year} \rightarrow 1 \quad 2 \quad 1 \\ \quad \quad \downarrow \quad \downarrow \quad \downarrow \\ \quad \quad 3 \quad 3 \quad 1 \end{array}$$

$$\text{C.I} = (3 \times 12 \times 250) + (3 \times 12 \times 30) + (12 \times 3.6)$$

$$= 9000 + 1080 + 43.2$$

$$= \text{Rs. } 10123.20$$

Alternate Method:

$$\begin{array}{ccc} \text{1st year} & & \text{3rd year} \\ 12\% & \longrightarrow & 40.4928\% \end{array}$$

$$\text{C.I} = \frac{25000 \times 40.4928}{100}$$

$$= \frac{10,12,320}{100} = \text{Rs. } 10,123.20$$

4.

(d)

$$R = \frac{10}{2}\% = 5\% = \frac{1}{2} + \frac{21}{20}$$

$$t = 3 \text{ half years.}$$

$$\text{Amount} = 64,827$$

$$\begin{array}{cc} P & A \\ 20 & 21 \\ 20 & 21 \\ 20 & 21 \end{array}$$

$$\begin{array}{cc} 8000 & 9261 \\ \downarrow \times 7 & \downarrow \times 7 \end{array}$$

$$\boxed{56000} \quad 64872$$

Alternate Method:

$$R = \frac{10}{2}\% = 5\% = \frac{1}{2} + \frac{21}{20}$$

$$t = 3 \text{ half years.}$$

$$\text{Amount} = 64,827$$

$$\text{Principal} = \frac{20}{21} \times \frac{20}{21} \times \frac{20}{21} \times 64827$$

$$= \frac{8000}{9261} \times 64827$$

$$= 8000 \times 7 = \text{Rs. } 56000$$

5. (b)

Peter	Rachel
Sum = P	Sum = $\frac{P}{2}$
R = 10%	R = 10%
S.I	C.I
t = 2 yrs.	t = 3 yrs

ATQ,

$$I = \frac{20}{100} \times P \quad I = \frac{33.1}{100} \times \frac{P}{2}$$

$$\text{Then, Difference} = \frac{20P}{100} - \frac{33.1P}{200} = 897$$

$$\Rightarrow 40P - 33.1P = 897 \times 200$$

$$\Rightarrow 6.9P = 897 \times 200$$

$$\Rightarrow P = 26000$$

$$\therefore \text{Sum with Rachel} = \frac{P}{2} = \text{Rs. } 13000$$

6. (c)

We know,

$$\begin{aligned} \text{Difference in 1 year} &= 1260 - 1200 \\ &= \text{Rs. } 60 \end{aligned}$$

Rs.60 is intrest on 1200

$$\therefore R = \frac{60}{1200} \times 100 = 5\%$$

7. (b)

$$P = 8000, R = 10\%$$

$$t = 2 \text{ half yrs}$$

$$\therefore \text{CI} = \frac{21}{100} \times 8000$$

$$= \text{Rs. } 1680$$

8. (a)

$$P = 6500 \quad R = 5\%$$

$$t = 4 \text{ half years}$$

$$\text{Amount} = 6500 \left[1 + \frac{5}{100} \right]^4$$

$$= 6500 \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20} \times \frac{21}{20}$$

$$= \text{Rs. } 7900$$

9. (b)
Difference between SI and CI for 3 yrs (d)

$$= P \left(\frac{r}{100} \right)^2 \left(3 + \frac{r}{100} \right)$$

$$= 6500 \left(\frac{7}{100} \right)^2 \left(3 + \frac{7}{100} \right)$$

$$= 6500 \times \frac{49}{100} \times \frac{307}{100} = 97.78$$



SMART APPROACH:-

Effective Rate for SI for 3 year
 $= 3R\% = 3 \times 7\% = 21\%$
 Effective Rate for CI for 3 year
 $= 3R.3R^2 | R^3$
 $= 21.147 | 343$
 $= 22.5043$
 Difference Rate%
 $= (22.5043 - 21)\% = 1.5043\%$
 Difference $= 6500 \times 1.5043\%$
 $= 97.7795 = \text{Rs. } 97.78 (\text{Appx})$

10. (a)
Given,
 $P = 50000$
 $T = 3 \text{ year}$
 $R = 10\%$
 $I = 15000$

We know that, $10\% = \frac{1}{10}$

The amount he owes at the end of 1st year

$$= 50000 \times \frac{11}{10} - 15000$$

$$= 55000 - 15000 = \text{Rs. } 40000$$

The amount he owes at the end of 2nd year-

$$= 40000 \times \frac{11}{10} - 15000$$

$$= 44000 - 15000 = \text{Rs. } 29000$$

The amount he owes at the end of 3rd year-

$$= 29000 \times \frac{11}{10} - 15000$$

$$= 31900 - 15000 = \text{Rs. } 16900$$

11. (a)
 $\text{Rate} = \frac{8}{2} = 4\%$
 $\text{Time} = 18 \times \frac{1}{6} = 3$
 $4\% = \frac{1}{25}$

$$\text{Amount} = 7500 \times \frac{26}{25} \times \frac{26}{25} \times \frac{26}{25}$$

$$= 8436.48$$

12. (a)
 $D = P \left(\frac{r}{100} \right)^2 \left(3 + \frac{r}{100} \right)$
 $= 15625 \left(\frac{4}{100} \right)^2 \left(3 + \frac{4}{100} \right)$
 $= 15625 \times \frac{16}{10000} \times \frac{304}{100} = \text{Rs. } 76$

13. (d)
 Simple Interest for 1 year = 16%
 Rate for CI $= \left(8 + 8 + \frac{8 \times 8}{100} \right)\%$
 $= 16.64\%$
 Difference $= (16.64 - 16)\% = 0.64\%$
 $\therefore 0.64\% = 60$

$$\therefore 100\% = \frac{60}{0.64} \times 100 = ₹ 9375$$

Hence, The lent sum = ₹9375

14. (d)
 $A = 7436$
 $t = 2 \text{ year}$
 $r = 4\%$

$$A = P \left(1 + \frac{r}{100} \right)^t$$

$$\Rightarrow 7436 = P \left(1 + \frac{4}{100} \right)^2$$

$$\Rightarrow 7436 = P \left(\frac{26}{25} \right)^2$$

$$\Rightarrow 7436 = \frac{676P}{625}$$

$$\Rightarrow P = \frac{7436 \times 625}{676}$$

$$\Rightarrow P = 6875$$



SMART APPROACH:-

We know, $4\% = \frac{1}{25}$

$$\text{Principle} = 7436 \times \left(\frac{25}{26} \right)^2$$

$$= \text{Rs. } 6875$$

15. (b)
 Difference $= 8469.44 - 7562$
 $= 907.44$
 $\text{Rate}\% = \frac{907.44}{7562} \times 100\% = 12\%$

16. (a)
 Difference $= 8469.44 - 7562$
 $= 907.44$
 $\text{Rate}\% = \frac{907.44}{7562} \times 100\% = 12\%$
 Now,
 $P = 10000, R = 12\%, T = 2 \text{ years}$
 $= 10,000 \left[\left(1 + \frac{12}{100} \right)^2 - 1 \right]$
 $= 10,000 \times \frac{212}{100} \times \frac{12}{100} = 2544$

17. (c)
 Difference $= \frac{17^2}{100} = 2.89\%$
 Sum, $100\% = \frac{433.5}{2.89} \times 100$
 $= \text{Rs. } 15000$

18. (c)
 Difference $= \frac{17^2}{100} = 2.89\%$
 Sum, $100\% = \frac{433.5}{2.89} \times 100$
 $= \text{Rs. } 15000$

$$\text{Net CI} = 17 + 17 + \frac{17 \times 17}{100} = 36.89\%$$

$$\text{CI} = 15000 \times 36.89\% = \text{Rs. } 5533.50$$

19. (b)
 SI for 2 year = 20%
 CI for 2 year = 21%
 $\text{CI} = \frac{8100}{20} \times 21 = 8505$

20. (a)
 $P = ?$
 $8100 = \frac{P \times 10 \times 2}{100}$
 $P = 40500$
 CI of 2 years at the Rate 15%

$$I = 40500 \times \frac{15}{100} = 6075$$

$$II = 6075 + 911.25$$

$$\text{Total CI} = 6075 \times 2 + 911.25$$

$$= 12150 + 911.25$$

$$= 13061.25$$

$$\approx 13061$$



SMART APPROACH:-

SI for 2 year at 10% = 20%
 CI for 2 year at 15% = 32.25%

$$\text{CI} = \frac{8100}{20} \times 32.25 = \text{Rs. } 13061.25$$

21. (a)
 In one year $= \sqrt{\frac{44100}{40000}} = \frac{21}{20} \dots (1)$

$$R\% = \frac{1}{20} \times 100 = 5\%$$

22. (b)

 $P = 35680 \times \frac{35680}{53520} = \text{Rs. } 23786$
 C.I for 3 yrs. $= 35680 - 23786$
 $= \text{Rs. } 11894$

23. (b)

$$\text{New rate} = 8\%, \text{ cycle} = \frac{16m}{8m} = 2$$

$$\text{Net CI} = 8 + 8 + \frac{8 \times 8}{100} = 16.64\%$$

$$\text{CI} = 37500 \times 16.64\% = 6240$$

24. (c)

$$\text{CI for 3 years} = 3630$$

$$\text{CI for 2 years} = 3300$$

$$\text{Rate} = \frac{(3630 - 3300)}{3300} \times 100\%$$

$$= \frac{330}{3300} \times 100\% = 10\%$$

$$\text{CI for first year} = \frac{3300}{110} \times 100$$

$$= \text{Rs. } 3000$$

$$\text{Principal} = \frac{3000}{10\%} \times 100\% = 30,000$$

$$P = 30,000, R = 10\%, T = 2\frac{1}{2} \text{ year}$$

Interest compounded yearly
10% at 2 year successive = 21%

$$\text{Now, } 21 + 5 + \frac{21 \times 5}{100} = 27.05$$

$$\text{CI} = 30,000 \times \frac{27.05}{100} = 8115$$

$$\text{Amount} = 30000 + 8115 = \text{Rs. } 38115$$

25. (d)

$$P = 5000, A = 7200, t = 8 \text{ years}$$

$$A = P \left(1 + \frac{r}{100} \right)^t$$

$$\Rightarrow 7200 = 5000 \left(1 + \frac{r}{100} \right)^8$$

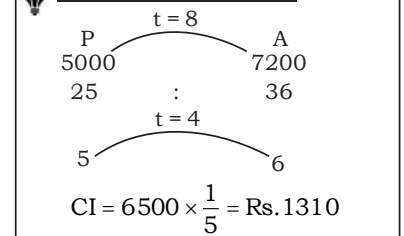
$$\Rightarrow \frac{7200}{5000} = \left(1 + \frac{r}{100} \right)^8$$

$$\Rightarrow \frac{\sqrt{36}}{\sqrt{25}} = \left(1 + \frac{r}{100} \right)^4$$

$$\Rightarrow \left(1 + \frac{r}{100} \right)^4 = \frac{6}{5}$$

$$\text{CI on a sum of Rs } 6550 \text{ in } 4 \text{ year at same rate} = 6550 \times \frac{1}{5} = \text{Rs. } 1310$$

SMART APPROACH:-



26. (a)

Using Successive Method,
Net CI for 2 Years at 10% = 21%

$$\text{Sum} = \frac{1522.5}{21\%} \times 100\% = \text{Rs. } 7250$$

27. (d)

$$\text{Amount} = 12777.6$$

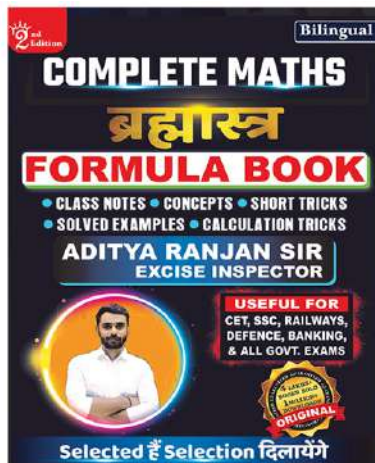
Interest compounded eight monthly

$$\text{New rate} = 10\%$$

$$\text{Time} = 3 \text{ cycle}$$

$$\text{Net CI for 3 cycle at } 10\% = 33.1\%$$

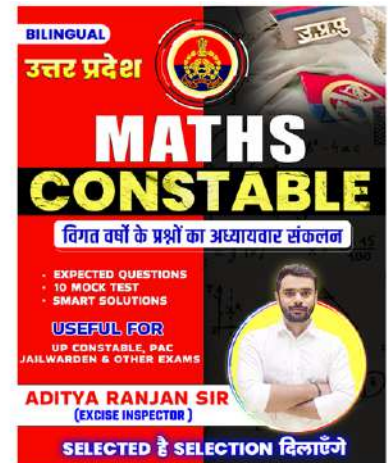
$$\text{Sum} = \frac{12777.6}{133.1} \times 100\% = \text{Rs } 9600$$



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RATIO & PROPORTION

06

प्रश्नोत्तर

1. The areas of the two triangles are in the ratio 4 : 3 and their heights are in the ratio 6 : 5. Find the ratio of their bases.

दिया गया है कि दो त्रिभुजों के क्षेत्रफल का अनुपात 4 : 3 है और उनकी ऊँचाई का अनुपात 6 : 5 है। उनके आधारों का अनुपात ज्ञात करें।

SSC CPO 03/10/2023 (Shift-01)

- (a) 5 : 6 (b) 10 : 9
(c) 9 : 10 (d) 8 : 5

2. The radii of two cylinders are in the ratio of 4 : 5 and their heights are in the ratio of 5 : 2. The ratio of their volume is:

दिया गया है कि दो सिलिंडरों के त्रिज्याओं का अनुपात 4 : 5 है और उनकी ऊँचाई का अनुपात 5 : 2 है। उनके आयतनों का अनुपात ज्ञात करें।

SSC CPO 03/10/2023 (Shift-01)

- (a) 9 : 7 (b) 9 : 4
(c) 8 : 5 (d) 2 : 1

3. Two numbers are in the ratio 5:3 and the difference between these two numbers is 34. Find the smaller of the two numbers.

दिया गया है कि दो संख्याएँ 5:3 के अनुपात में हैं। इन संख्याओं का अंतर 34 है। इनमें से छोटी संख्या ज्ञात करें।

SSC CPO 03/10/2023 (Shift-01)

- (a) 68 (b) 34
(c) 51 (d) 85

4. A company is manufacturing boxes of three types – plastic, wood and glass. The ratio of the numbers of plastic, wood and glass boxes is 2 : 3 : 5. The difference between the numbers of wood and glass boxes is 144. If the number of plastic boxes is increased by 25%, then what will be the number of plastic boxes now?

दिया गया है कि एक कंपनी तीन प्रकार के बॉक्स (प्लास्टिक, लकड़ी और काँच) बना रही है। प्लास्टिक, लकड़ी और काँच के बॉक्सों की संख्याओं का अनुपात 2 : 3 : 5 है। लकड़ी और काँच के बॉक्सों के बीच का अंतर 144 है। यदि प्लास्टिक बॉक्सों की संख्या 25% बढ़ा दी जाए, तो प्लास्टिक बॉक्सों की संख्या क्या होगी?

SSC CPO 04/10/2023 (Shift-03)

- (a) 2 : 5
(b) 7 : 17
(c) 7 : 12
(d) 1 : 5

5. The heights of two cones are in the ratio 7 : 5 and their diameters are in the ratio 10 : 21. What is the ratio of their volumes? (Where $\pi = \frac{22}{7}$)

SSC CPO 04/10/2023 (Shift-01)

- (a) 144 (b) 216
(c) 360 (d) 180

6. Two mixtures A and B have the following compositions: Mixture A has copper and tin in a ratio of 1 : 2 Mixture B has copper and tin in a ratio of 1 : 3 If equal quantities of mixtures A and B are used for producing mixture C, then find the ratio of copper and tin in mixture

$$\pi = \frac{22}{7}$$

दिया गया है कि दो मिश्रण A और B निम्नलिखित संरचनाएँ हैं: मिश्रण A में ताम्र और टिन का अनुपात 1 : 2 है। मिश्रण B में ताम्र और टिन का अनुपात 1 : 3 है। यदि समान मात्रा में मिश्रण A और B का उपयोग मिश्रण C के उत्पादन के लिए किया जाता है, तो मिश्रण C में ताम्र और टिन का अनुपात ज्ञात करें।

$$\pi = \frac{22}{7}$$

SSC CPO 04/10/2023 (Shift-02)

- (a) 17 : 21 (b) 14 : 19
(c) 20 : 63 (d) 26 : 47

7. Ram has 12 hens and 5 cows, Shyam has 18 hens and 9 cows, Preetham has 4 hens and 8 cows, and Vinay has 10 hens and 7 cows. Who has a greater ratio of hens to cows?

दिया गया है कि राम 12 मुर्गों और 5 गायों, श्याम 18 मुर्गों और 9 गायों, प्रीथम 4 मुर्गों और 8 गायों, और विनाय 10 मुर्गों और 7 गायों के मालिक हैं। इनमें से किसका मुर्गों की संख्या गायों की संख्या से अधिक है?

SSC CPO 04/10/2023 (Shift-03)

- (a) 2 : 5
(b) 7 : 17
(c) 7 : 12
(d) 1 : 5

8. The monthly income of an employee was Rs.26,500 and his monthly expenditure was Rs. 22,000. Next year his income increased by 20% and his expenditure increased by 15%. Find the percentage increase in his savings.

दिया गया है कि एक कर्मचारी का मासिक आय ₹ 26,500 था और मासिक व्यय ₹ 22,000 था। अगले वर्ष उसका आय 20% बढ़ा और व्यय 15% बढ़ा। उसकी बचत में प्रतिशत वृद्धि ज्ञात करें।

SSC CPO 05/10/2023 (Shift-02)

- (a) Shyam/. श्याम
(b) Preetham/प्रीथम
(c) Vinay/विनाय
(d) Ram/राम

9. Which of the following ratios is the greatest?

निम्नलिखित में से कौन सा अनुपात सबसे अधिक है?

SSC CPO 05/10/2023 (Shift-02)

- (a) $44\frac{4}{9}\%$ (b) $44\frac{7}{9}\%$
(c) $44\frac{5}{9}\%$ (d) $44\frac{8}{9}\%$

10. The ratio of the numbers of plastic, wood and glass boxes is 2 : 3 : 5. The difference between the numbers of wood and glass boxes is 144. If the number of plastic boxes is increased by 25%, then what will be the number of plastic boxes now?

दिया गया है कि प्लास्टिक, लकड़ी और काँच के बॉक्सों की संख्याओं का अनुपात 2 : 3 : 5 है। लकड़ी और काँच के बॉक्सों के बीच का अंतर 144 है। यदि प्लास्टिक बॉक्सों की संख्या 25% बढ़ा दी जाए, तो प्लास्टिक बॉक्सों की संख्या क्या होगी?

SSC CPO 05/10/2023 (Shift-02)

- (a) 7 : 10 (b) 1 : 3
(c) 5 : 6 (d) 2 : 5

10. If $\frac{x}{4y} = \frac{3}{4}$, then the value of $\frac{2x+3y}{x-2y}$ is:

ज्ञाती $\frac{x}{4y} = \frac{3}{4}$ है कि $\frac{2x+3y}{x-2y}$ का मान क्या है?

SSC CPO 05/10/2023 (Shift-02)

- (a) 8 (b) 6
(c) 9 (d) 7

11. In a school of 720 students, the ratio of boys to girls is 3 : 5. Find how many new boys may be allowed to the school if 18 new girls are admitted, so that the ratio of boys to girls changes to 2 : 3.

धरती एक स्कूल में 720 छात्रों की संख्या है। लड़कों और लड़कियों का अनुपात 3 : 5 है। यदि 18 नए लड़कियाँ स्वीकार की जाती हैं, तो लड़कों और लड़कियों का अनुपात 2 : 3 हो जाए। स्कूल में कितने नए लड़कों को स्वीकार किया जा सकता है?

SSC CPO 05/10/2023 (Shift-03)

- (a) 42 (b) 50
(c) 44 (d) 38

12. The ratio of monthly income and expenditure of a man is 7 : 3. If his expenditure is Rs.5,400, find his monthly income.

एक व्यक्ति के मासिक आय और व्यय का अनुपात 7 : 3 है। यदि उसका मासिक व्यय ₹ 5,400 है, तो उसका मासिक आय क्या है?

SSC CPO 05/10/2023 (Shift-03)

- (a) Rs.11,500 (b) Rs.13,300
(c) Rs.12,600 (d) Rs.10,400

13. If 42, 36 and 35 are the first three terms of a proportion, then the fourth term is:

यदि 42, 36 और 35 एक अनुपात के पहले तीन पद हैं, तो चौथा पद क्या है?

SSC CPO 03/10/2023 (Shift-01)

- (a) 30 (b) 32
(c) 28 (d) 27

14. If $a \propto b$, $b \propto \frac{1}{c}$ and $c \propto d$, then the relation between a and d is:

यदि $a \propto b$, $b \propto \frac{1}{c}$ और $c \propto d$ हैं, तो a और d के बीच संबंध क्या है?

अतः $a \propto \frac{1}{d}$ है।

SSC CPO 03/10/2023 (Shift-02)

- (a) $a \propto \sqrt{d}$ (b) $a \propto d$

- (c) $a \propto \frac{1}{d}$ (d) $a \propto d^2$

15. Find the third proportional to 16 and 20.

16 और 20 के तृतीय अनुपातिक को ज्ञात करें।

SSC CPO 03/10/2023 (Shift-3)

- (a) 23 (b) 25
(c) 24 (d) 26

16. Find the third proportional to 23 and 31.

23 और 31 के तृतीय अनुपातिक को ज्ञात करें।

SSC CPO 03/10/2023 (Shift-3)

- (a) $\frac{23}{961}$ (b) $\frac{31}{23}$

- (c) $\frac{23}{31}$ (d) $\frac{961}{23}$

17. Find the mean proportional between 32 and 162.

32 और 162 के मध्य अनुपातिक को ज्ञात करें।

SSC CPO 04/10/2023 (Shift-01)

- (a) 65 (b) 97
(c) 72 (d) 99

18. The fourth proportional to 0.3, 0.8 and 0.108 is:

0.3, 0.8 और 0.108 के चौथे अनुपातिक को ज्ञात करें।

SSC CPO 04/10/2023 (Shift-02)

- (a) 0.482 (b) 0.124
(c) 0.144 (d) 0.288

19. Find the mean proportion of x^2y and xy^3 .

x^2y और xy^3 के मध्य अनुपातिक को ज्ञात करें।

SSC CPO 04/10/2023 (Shift-03)

- (a) xy (b) x^2y^2
(c) x^3y^3 (d) x^4y^4

20. The mean proportional between 0.03 and 0.0003 is:

0.03 और 0.0003 के मध्य अनुपातिक को ज्ञात करें।

SSC CPO 05/10/2023 (Shift-01)

- (a) 0.0013 (b) 0.003
(c) 0.0003 (d) 0.033

21. Find the fourth proportional to 0.48, 0.84 and 32.

0.48, 0.84 और 32 के चौथे अनुपातिक को ज्ञात करें।

SSC CPO 05/10/2023 (Shift-01)

- (a) 34 (b) 65
(c) 43 (d) 56

22. Find the fourth proportional to 22, 66 and 11.

22, 66 और 11 के चौथे अनुपातिक को ज्ञात करें।

SSC CPO 05/10/2023 (Shift-3)

- (a) 33 (b) 39
(c) 17 (d) 23

23. If $p : q = 4 : 5$, $q : r = 3 : 4$ and $r : s = 2 : 5$, then $p : s$ is:

यदि $p : q = 4 : 5$, $q : r = 3 : 4$ और $r : s = 2 : 5$ हैं, तो $p : s$ क्या है?

SSC CPO 09/11/2022 (Shift-01)

- (a) 2 : 5 (b) 6 : 25
(c) 5 : 2 (d) 25 : 6

24. Four numbers are in the ratio 1 : 2 : 3 : 5. Two times their sum is 44. Find the ratio in the numbers obtained by subtracting 3 from the cube of each number.

चार संख्याएँ 1 : 2 : 3 : 5 के अनुपात में हैं। इन संख्याओं के घनों से 3 घटाकर प्राप्त संख्याओं का अनुपात ज्ञात करें।

SSC CPO 09/11/2022 (Shift-01)

- (a) 2 : 31 : 204 : 999
(b) 2 : 13 : 208 : 992
(c) 11 : 67 : 219 : 1003
(d) 5 : 61 : 213 : 997

25. The cost of two varieties of tea is Rs. 300 and Rs. 375 respectively. If both the varieties of tea are mixed together in the ratio 3 : 2, then what should be the price of mixed variety of tea per kg?

दो प्रकार की चायों की कीमतें ₹ 300 और ₹ 375 हैं। यदि दोनों प्रकार की चायों को 3 : 2 के अनुपात में मिलाया जाए, तो मिश्रित चाय का प्रति किलोग्राम कीमत क्या होना चाहिए?

SSC CPO 09/11/2022 (Shift-01)

- (a) Rs. 340 (b) Rs. 330
(c) Rs. 350 (d) Rs. 360

26. The monthly income of two persons is the ratio 4 : 5 and their expenditures are in the ratio 7 : 9. If each saves Rs. 50 per month, then their monthly incomes are:
27. Which of the following is the smallest ratio
28. The monthly incomes of Ravi and Shiv are in the ratio 1 : 2 and their monthly expenditures are in the ratio 1 : 3. If each saves Rs. 4,000 per month, then find the monthly income of Shiv.
29. The price of a bat and a ball are in the ratio 9 : 5. The price of the bat is Rs. 380 more than the price of the ball. Find the price of the ball.
30. The ratio of a father's age to his son's age is 3 : 2. The product of the numbers representing their age is 486. The ratio of their ages after 5 years will be:

SSC CPO 09/11/2022 (Shift-02)

- (a) Rs. 900; Rs. 500
(b) Rs. 400; Rs. 500
(c) Rs. 700; Rs. 900
(d) Rs. 400; Rs. 700

SSC CPO 10/11/2022 (Shift-01)

- (a) 41 : 92 (b) 33 : 41
(c) 42 : 49 (d) 35 : 47

SSC CPO 10/11/2022 (Shift-02)

- (a) Rs. 16000 (b) Rs. 18000
(c) Rs. 14000 (d) Rs. 20000

SSC CPO 10/11/2022 (Shift-02)

- (a) Rs. 470 (b) Rs. 485
(c) Rs. 475 (d) Rs. 480

नी छ केन दे। कहि। की बपन से एक न दे। कहिन के। पछकी धी वे ओ' में बपन दे। कह न के। कसि 8 के दे प जेजक केन के। हवा खै तधमी में ले 8 के दे बपन दे। कहिन के। पछ न जके कुक

SSC CPO 10/11/2022 (Shift-03)

- (a) 32 : 24 (b) 32 : 21
(c) 32 : 22 (d) 32 : 23

31. Which of the following is the lowest ratio?

पम्पी एन सेन की के। पछकी पछ सेन एी के

SSC CPO 11/11/2022 (Shift-02)

- (a) 3 : 22 (b) 23 : 29
(c) 17 : 5 (d) 5 : 19

32. The ratio of first and second sum of money is 7 : 8. If the first sum is 35, the second sum is:

छे दे। की छे दे के केन के। पछकी धी व धी में ज छे दे के केले में के छे के के के छे

SSC CPO 11/11/2022 (Shift-03)

- (a) 56 (b) 40
(c) 45 (d) 44

33. The salaries of A, B and C are in ratio of $\frac{3}{2} : \frac{6}{5} : \frac{4}{3}$. The salary of A and B together is Rs. 40,500. By what percentage is the salary of A more than that of C?

A, B की C न से 8 सपी $\frac{3}{2} : \frac{6}{5} : \frac{4}{3}$ न स। पछकी एन में A की B न के 8 सपी ए के तरुतरु 9 खसि में A न के 8 सपवे C न से 8 सप पे सन, पे सख .की। 0 नी में

SSC CPO 10/11/2022 (Shift-03)

- (a) 12% (b) 13%
(c) 11.5% (d) 12.5%

34. The mean proportional between 0.04 and 0.36 is:

रुजती। की रुजमी न से छे एन के दे जक कुक

SSC CPO 09/11/2022 (Shift-03)

- (a) 0.144 (b) 1.2
(c) 12 (d) 0.12

35. If X, Y, Z and W are in fourth proportion. X = 3, Y = 13 and W = 39, then the value of Z.

ज छि X, Y, Z की W. एन के एन में X = 3, Y = 13 की W = 39 में के Z न के एकी को न दर 1

SSC CPO 10/11/2022 (Shift-02)

- (a) 5 (b) 20
(c) 15 (d) 9

36. The ratio of the third proportional to 16 and 40 and the mean proportional between 10 and 40 is:
- खी। की तरी नी 3 के के दे श्री के की तर नी सखी एन के दे न के। पछकी जके में

SSC CPO 11/11/2022 (Shift-01)

- (a) 5 : 1 (b) 1 : 5
(c) 4 : 1 (d) 1 : 4

37. The third proportional of 0.024 and 0.12 is:

रुजती। की रुजमी न के 3 के के दे जके कुक

SSC CPO 11/11/2022 (Shift-01)

- (a) 0.060 (b) 6.000
(c) 0.600 (d) 0.006

38. The mean proportion of 0.03 and 0.27 is:

रुजती। की रुजमी न के एन के दे को न दर 1

SSC CPO 11/11/2022 (Shift-03)

- (a) 0.09 (b) 0.06
(c) 0.03 (d) 0.15

39. Seven years ago, the ratio of the ages of A and B was 4 : 5. Eight years hence, the ratio of the ages of A and B will be 9:10. What is the sum of their present ages in years?

पछकी 8 के छे सी। की बीन दे। कहिन के पछकी ती वे ले श्री। की 8 के छे वे सी। की बीन दे। कह न के। पछकी ती वे छे की बपन दे 8 एकी। कह न के जके के छे 8 के एकी को न स

SSC CPO 23/11/2020 (Shift-1)

- (a) 41 (b) 82
(c) 32 (d) 56

40. A sum of Rs.8,200 was divided among A, B and C in such a way that A has Rs.500 more than B, and C has Rs.300 more than A. How much was A's share (in Rs.)?

छदरु 9 खसि में के केन के A, B। की सीन स छे इी ख के 81 कर नी न जके के में A न के बी पे तरुतरु 9 खसि 0 नी। की सीन का A पे तरुतरु 9 खसि 0 नी खसि में के में A न के स् के 9 खसि एकी को न स

SSC CPO 23/11/2020 (Shift-2)

- (a) 2,300 (b) 3,100
(c) 2,000 (d) 2,800

- Selected प्रSelection तथा लार्थ 50**

(a) 5 : 8 (b) 8 : 3
(c) 5 : 7 (d) 3 : 5

1.(b)	2.(c)	3.(c)	4.(d)	5.(c)	6.(b)	7.(d)	8.(a)	9.(c)	10.(c)
11.(a)	12.(c)	13.(a)	14.(c)	15.(b)	16.(d)	17.(c)	18.(d)	19.(b)	20.(b)
21.(d)	22.(a)	23.(b)	24.(d)	25.(b)	26.(b)	27.(a)	28.(a)	29.(c)	30.(d)
31.(a)	32.(b)	33.(d)	34.(d)	35.(d)	36.(a)	37.(c)	38.(a)	39.(a)	40.(d)
41.(d)	42.(c)	43.(c)	44.(d)	45.(a)	46.(d)	47.(c)	48.(a)	49.(d)	50.(a)
51.(c)	52.(a)	53.(d)	54.(b)	55.(c)	56.(a)	57.(a)			

SOLUTIONS

1. (b)

$$\begin{array}{lcl} A & : & B \\ \text{Area} \rightarrow & 4 & : \quad 3 \\ \text{Height} \rightarrow & 6 & : \quad 5 \\ \text{Base} \rightarrow \frac{4}{6} & : & \frac{3}{5} \\ \text{Base} = & 10 : 9 & \end{array}$$

2. (c)

$$\begin{array}{lcl} A & : & B \\ \text{Radii} \rightarrow & 4 & : \quad 5 \\ \text{Height} \rightarrow & 5 & : \quad 2 \\ V = \pi r^2 h \rightarrow & 80 & : \quad 50 \\ & 8 & : \quad 5 \end{array}$$

3. (c)

$$\begin{array}{lcl} A & : & B \\ 5 & & 3 \\ & \searrow & \nearrow \\ & -2 & \end{array}$$

ATQ,
Difference = 2 unit $\rightarrow 34$
Smaller (3 unit) = 51

4. (d)

$$\begin{array}{lcl} P & W & G \\ \text{no.} & 2 & 3 \quad 5 \\ & & \nearrow \\ & & +2 \end{array}$$

ATQ,
Difference = 2 unit $\rightarrow 144$ = plastic boxes.

$$25\% = \frac{1}{4} \rightarrow \frac{5}{4}$$

Then, new no. of plastic boxes

$$= \frac{5}{4} \times 144 = 180$$

5. (c)

$$\begin{array}{lcl} A & : & B \\ \text{Height} \rightarrow & 7 & : \quad 5 \\ \text{Radius} \rightarrow & 10 & : \quad 21 \\ V = \frac{1}{3} \pi r^2 h \rightarrow & 700 & : \quad 2205 \\ & 20 & : \quad 63 \end{array}$$

6. (b)

$$\begin{array}{lcl} \text{Cu} & : & \text{Tin} \\ A \rightarrow (1 & : & 2) \times 4 \\ B \rightarrow (1 & : & 3) \times 3 \\ A \rightarrow 4 & : & 8 \\ B \rightarrow 3 & : & 9 \\ \hline C \rightarrow 7 & : & 17 \end{array}$$

7. (d)

$$\begin{array}{lcl} H & C \\ R & 12 & 5 \Rightarrow 2.4 \\ S & 18 & 9 \Rightarrow 2 \\ P & 4 & 8 \Rightarrow 0.5 \\ V & 10 & 7 \Rightarrow 1.4 \end{array}$$

$\therefore$ Ram has greatest ratio of hens to cows.

8. (a)

	Income	Exp.	Savings
I	26500	22000	4500
II	31800	25300	6500

2000

$\therefore$ increase in savings = $\frac{2000}{4500} \times$

$$100 = 44 \frac{4}{9} \%$$

9. (c)

from options:-

$$\frac{7}{10} = 0.7$$

$$\frac{1}{3} = 0.34$$

$$\frac{5}{6} = 0.83 \rightarrow \text{greatest}$$

$$\frac{2}{5} = 0.4$$

10. (c)

$$\frac{x}{4y} = \frac{3}{4}$$

$$\Rightarrow \frac{x}{y} = \frac{3}{1}$$

Now,

$$\frac{2x+3y}{x-2y} = \frac{6+3}{3-2} = \frac{9}{1} = 9$$

11. (a)

720	
Boys	Girls
270	450
+x	+18
2	3

ATQ,

$$\begin{array}{l} 3 \text{ unit} = 468 \\ 2 \text{ unit} = 312 \\ \therefore 270 + x = 312 \\ \Rightarrow x = 312 - 270 = 42 \end{array}$$

12. (c)

$$\begin{array}{lcl} \text{Income} & : & \text{Exp.} \\ 7 & & 3 \\ 3 \text{ unit} & = & 5400 \\ \text{Income (7 unit)} & = & \frac{5400}{3} \times 7 \\ & = & 12,600 \end{array}$$

13. (a)

Let fourth term be x .

$$\frac{42}{36} = \frac{35}{x}$$

$$\Rightarrow x = \frac{35 \times 36}{42}$$

$$\Rightarrow x = 30$$

14. (c)

$$a \propto b \propto \frac{1}{c} \propto \frac{1}{d}$$

$$\Rightarrow a \propto \frac{1}{d}$$

15. (b)

Let, third proportional be x then,

$$\frac{16}{20} = \frac{20}{x}$$

$$\Rightarrow x = \frac{400}{16}$$

$$\Rightarrow x = 25$$

16. (d)

Let, third proportional be x .

$$\text{then, } \frac{23}{31} = \frac{31}{x}$$

$$\Rightarrow x = \frac{31 \times 31}{23} = \frac{961}{23}$$

17. (c)
Let, mean proportional be x .
 $x = \sqrt{ab}$, where (a = 1st number)
(b = 2nd number)

then,

$$x = \sqrt{32 \times 162} = \sqrt{8 \times 4 \times 2 \times 81} = 72$$

18. (d)
Let fourth proportional be x .

$$\text{then, } \frac{0.3}{0.8} = \frac{0.108}{x}$$

$$\Rightarrow x = \frac{0.108 \times 0.8}{0.3}$$

$$= 0.288$$

19. (b)
Let mean proportional be a

$$\Rightarrow a = \sqrt{x^3 y \cdot xy^3}$$

$$= x^2 \times y^2$$

20. (b)
Let mean proportional be x

$$\Rightarrow x = \sqrt{0.03 \times 0.0003}$$

$$= \sqrt{3 \times 3 \times \frac{1}{10^6}}$$

$$= \frac{3}{10^3} = 0.003$$

21. (d)
Let, fourth proportional be x .

$$\text{then, } \frac{0.48}{0.84} = \frac{32}{x}$$

$$\Rightarrow x = \frac{32 \times 84}{48}$$

$$= 56$$

22. (a)
Let, fourth proportional be x

$$\Rightarrow \frac{22}{66} = \frac{11}{x}$$

$$\Rightarrow x = 33$$

23. (b)
 $p : q = 4 : 5$
 $q : r = 3 : 4$
 $r : s = 2 : 5$
 $p : q : r : s = 24 : 30 : 40 : 100$
Hence, $p : s = 6 : 25$

24. (d)
Let, the four number be a, b, c & d .
Given that, $a : b : c : d$
 $= 1 : 2 : 3 : 5$

According to question,

$$2(a + b + c + d) = 44$$

$$2(1 + 2 + 3 + 5) \text{ units} = 44$$

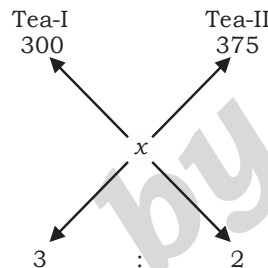
$$1 \text{ units} = 2$$

$$a = 2, b = 4, c = 6, d = 10$$

Hence, The required ratio

$$= 5 : 61 : 213 : 997$$

25. (b)
Let the mixed price of the tea is Rs. x .



Now,

$$\Rightarrow \frac{375 - x}{x - 300} = \frac{3}{2}$$

$$\Rightarrow 750 - 2x = 3x - 900$$

$$\Rightarrow 750 + 900 = 3x + 2x$$

$$\Rightarrow 1650 = 5x$$

$$\Rightarrow x = 330$$

SMART APPROACH:-

Mixed price = $\frac{3 \times 300 + 2 \times 375}{3 + 2}$

$= \frac{900 + 750}{5} = \frac{1650}{5} = \text{Rs. } 330$

26. (b)
Income : 4 : 5 $\rightarrow$ 8 : 10
Expense : 7 : 9 $\rightarrow$ 7 : 9
1 unit = Rs.50
Their monthly income be 400, 500

27. (a)
With the help of basic division.

$$\frac{41}{92} = 0.44, \frac{33}{41} = 0.80, \frac{42}{49} = 0.85$$

$$\frac{35}{47} = 0.74$$

Hence, Smallest fraction is $41 : 49$.

SMART APPROACH:-

Higher the difference between antecedent and consequent, the smaller the ratio.
Hence, Answer (a)

28. (a)
- | | Ram | Shiv | Ram | Shiv |
|---------|-----|------|---------------|-------|
| Income | 1 | 2 | $\rightarrow$ | 2 : 4 |
| Expense | 1 | 3 | $\rightarrow$ | 1 : 3 |
- 1 unit = 4000
Income of Shiv = 4 unit = 4×4000
= Rs.16000

29. (c)
4 Unit = Rs. 380
Price of ball = $5 \times \frac{380}{4} = \text{Rs. } 475$

30. (d)
Let age of father = $3x$
Age of son = $2x$
ATQ, product of their age = 486
 $\Rightarrow 3x \times 2x = 486$
 $\Rightarrow x^2 = 81$
 $\Rightarrow x = 9$

Age of father after 5 year

$$= 3 \times 9 + 5 = 32$$

Age of son after 5 year

$$= 2 \times 9 + 5 = 23$$

Required ratio = 32 : 23

31. (a)
3 : 22 is the lowest ratio.

32. (b)
Second Sum = $35 \times \frac{8}{7} = 40$

33. (d)
 $A : B : C = \frac{3}{2} : \frac{6}{5} : \frac{4}{3}$
 $= 45 : 36 : 40$

$$\text{Required \%} = \frac{5}{40} \times 100\% = 12.5\%$$

34. (d)
Mean Proportion of a and $b = \sqrt{ab}$
Mean proportion of 0.04 and 0.36
 $= \sqrt{0.04 \times 0.36}$
 $= \sqrt{0.2 \times 0.2 \times 0.6 \times 0.6}$
 $= 0.2 \times 0.6 = 0.12$

35. (d)
 $\frac{X}{Y} = \frac{Z}{W}$
 $\Rightarrow \frac{3}{13} = \frac{Z}{39}$
 $\Rightarrow Z = 9$

36. (a)
Let the third proportion to 16 and 40 is x .
- $$\frac{16}{40} = \frac{40}{x} \Rightarrow x = \frac{40 \times 40}{16} = 100$$
- Again, Let mean proportional between 10 and 40 is y .
- $$y = \sqrt{10 \times 40} = 20$$
- Hence, $x : y = 100 : 20 = 5 : 1$
37. (c)
Let the third proportional of 0.024 and 0.12 be x .
- $$\Rightarrow \frac{0.024}{0.12} = \frac{0.12}{x}$$
- $$\Rightarrow x = \frac{0.12 \times 0.12}{0.024} = 0.6$$
38. (a)
Mean Proportion = $\sqrt{0.03 \times 0.27}$
= 0.09
39. (a)
7 years ago, $A : B = 4 : 5$
After 8 years, $A : B = 9 : 10$
5 unit $\rightarrow 7 + 8 = 15$ year
1 unit $\rightarrow 3$ year
Sum of present age of A and B
= $(9 + 10) \times 3 - (8 \times 2) = 41$ Years
40. (d)
Let the share of B = x
 $A : B : C = (n + 500) : x : (x + 800)$
ATQ, $x + 500 + x + x + 800 = 8200$
 $3x + 1300 = 8200$
 $3x = 6900$
 $x = 2300$
A's Share = $x + 500 = \text{Rs.}2800$
41. (d)
Let the share of B = x
 $A : B : C = (x + 500) : x : (x + 800)$
ATQ, $x + 500 + x + x + 800 = 8200$
 $3x + 1300 = 8200$
 $3x = 6900$
 $x = 2300$
C's share = $x + 800 = \text{Rs.}3100$
42. (c)
12 years ago, $A : B = 2 : 3$
At present, $A : B = 3 : 4$
1 unit = 12 years
At present, sum of age of A & B
= $(3 + 4) \times 12 = 84$ year

By option-

- Option is division by 7
Option (c) 84 is right
43. (c)
7 years ago, $A : B = 4 : 5$
After 8 year, $A : B = 9 : 10$
5 unit $\rightarrow 7 + 8 = 15$ year
1 unit = 3 year
Difference at present = 3 years
44. (d)
Let,
Total student = $12x$
- | | | | |
|----------------|----------------|----------------|----------------|
| Boys | | Girls | |
| $7x$ | | $5x$ | |
| $4x$ | $3x$ | $3x$ | $2x$ |
| Below
14yrs | Above
14yrs | Below
14yrs | Above
14yrs |
- Given, $7x = 1120 \Rightarrow x = 160$
Total student = $12x$
= $160 \times 12 = 1920$
45. (a)
Let the no. be $3x$ and $5x$.
ATQ,
$$\frac{3x+8}{5x+7} = \frac{2}{3}$$

$$\Rightarrow 9x + 24 = 10x + 14$$

$$\Rightarrow x = 10$$

When 6 is added,
Required ratio = $(3x + 6) : (5x + 6)$
= $36 : 56 = 9 : 14$
46. (d)
- | | | | |
|---------------------------|----------------------|-------|----------------|
| | A | : | B |
| Income | $3x$ | : | $5x$ |
| Exp | $4y$ | : | $7y$ |
| Saving = Income - Expense | | | |
| | $3x - 4y = 16000$ | ----- | $(1) \times 5$ |
| | $5x - 7y = 26000$ | ----- | $(2) \times 3$ |
| | $15x - 20y = 80,000$ | | |
| | $15x - 21y = 78,000$ | | |
| | $y = 2000$ | | |
- Difference b/w their expenditure
= $(7y - 4y) = 3y = 3 \times 2000 = \text{Rs.} 6000$
47. (c)
Method-1
Using concept of alligation,
- | | | | |
|---------|------|---|------|
| | A | : | B |
| Student | 42 | : | 30 |
| Avg. | $5x$ | : | $6x$ |
| Overall | 52 | | |
- $$42 \times 5x + 30 \times 6x = 52 \times 72$$
- $$210x + 180x = 52 \times 72$$
- $$390x = 52 \times 72$$

$$x = \frac{52 \times 72}{390} = 9.6$$

Avg. of students in section B = $6x$
= $6 \times 9.6 = 57.6$ kg

Method-2

Total student in section A and B = 72
Ratio of student, $A : B = 7 : 5$

$$\text{Student in B} = \frac{72}{12} \times 5 = 30$$

Ratio of weight of $A : B = 5x : 6x$
ATQ, $42 \times 5x + 30 \times 6x = 52 \times 72$
 $\Rightarrow 210x + 180x = 3744$
 $\Rightarrow 390x = 3744$
 $\Rightarrow x = 9.6$

Avg. weight of students in section B = $9.6 \times 6 = 57.6$ kg

48. (a)
Seven year ago, $A : B = 4 : 5$
Seven year hence, $A : B = 5 : 6$
1 unit = 14 year
Seven years ago,
Age of A = $4 \times 14 = 56$
After 5 Years,
Age of A = $56 + 12 = 68$
Seven Years Ago,
Age of B = $5 \times 14 = 70$
Seven year hence,
Age of B = $70 + 12 = 82$
Required ratio = $68 : 82 = 34 : 41$

49. (d)
- | | | | | |
|---------|---------------|---------------|-----------|----------|
| | Raju | Peter | Raju | Peter |
| Initial | $3x_1 : 5x_2$ | $\rightarrow$ | $6 : 10$ | |
| Final | $11 : 15$ | | $11 : 15$ |)+5 Unit |
- 5 Unit = 2500
1 Unit = 500
Salary of Peter = $10 \times 500 = \text{Rs.}5000$

Method-2

Raju	:	Peter
$3x$	:	$5x$

$$\Rightarrow \frac{3x + 2500}{5x + 2500} = \frac{11}{15}$$

$$\Rightarrow x = 1000$$

$$\Rightarrow \text{Peter salary} = 5 \times 1000 = \text{Rs.}5000$$

50. (a)
 $2A = 5B \Rightarrow \frac{A}{B} = \frac{5}{2}$
 $4B = 2C \Rightarrow \frac{B}{C} = \frac{2}{4} = \frac{1}{2}$
 $A : B : C = 5 : 2 : 4$
Salary of A = $\frac{1600}{4} \times 5$
= Rs. 2000

51. (c)

A : B : C : D

16 : 18 : 27 : 39

Difference b/w the shares of B and

$$D = \frac{12000}{100} \times (39 - 18)$$

$$= \frac{12000}{100} \times 21 = \text{Rs. } 2520$$

52. (a) **Method -1**

$$\frac{20-x}{37-x} = \frac{54-x}{105-x}$$

$x = 3$, satisfied the equation.

Mean proportional between $(7x - 5)$

and $(x + 1) = \sqrt{(7x - 5)(x + 1)}$

$$= \sqrt{(7 \times 3 - 5)(3 + 1)} = \sqrt{16 \times 4} = 8$$

Method -2

$$\frac{20}{17} : \frac{37}{20} :: \frac{54}{1} : \frac{105}{3}$$

$$\frac{20}{17} : \frac{37}{20} :: \frac{54}{1} : \frac{105}{3}$$

$$\frac{20}{17} : \frac{37}{20} :: \frac{54}{1} : \frac{105}{3}$$

$$2 \text{ unit} = 20 \times 3 - 54 \times 1$$

$$2 \text{ unit} = 6$$

$$\text{Then, } 1 \text{ unit} = x = 3$$

Mean proportional between $(7x - 5)$

and $(x + 1) = \sqrt{(7x - 5)(x + 1)}$

$$= \sqrt{(7 \times 3 - 5)(3 + 1)} = \sqrt{16 \times 4} = 8$$

53. (d)

7 year ago, $H + W + C = 42 \times 3 = 126$ At

present, $H + W + C = 126 + 3 \times 7 = 147$

9 year ago, $W + C = 36 \times 2 = 72$

At present, $W + C = 72 + 2 \times 9 = 90$

At present, $H = (147 - 90) = 57$

54. (b)

Two liquid A and B = 5 : 3 or 10 : 6

A : B

10 : 6
10 : 11 $\left. \begin{array}{l} 6 \\ 11 \end{array} \right\} +5$

5 unit - 10 litres

1 unit - 2 litres

Solution in the vessel = 21 unit

= 21×2 litres = 42 litres

55. (c)

I II
55rs./kg 70rs./kg

65rs./kg

Quantity $\rightarrow 5$ 10

1 : 2

Rice must be mixed in the ratio

1 : 2

56. (a)

Let x ltr of milk is added

ATQ,

Amount of water will same.

☆☆☆☆☆

$$\frac{60}{100} \times 60 = \frac{40}{100} \times (60 + x)$$

$$3600 = 2400 + 40x$$

$$\Rightarrow x = \frac{1200}{40} = 30 \text{ ltr.}$$

Alternate Method:-

Milk in
Solution Milk
40 liters 100 liters

60 liters

Quantity $\rightarrow 40$ 20
2 : 1

ATQ,

2 unit $\rightarrow 60$ ltr.

1 unit $\rightarrow 30$ ltr.

Hence, 30 ltr. of milk should be added.

57. (a)

I II
12 Rs./kg 25 Rs./kg

20 Rs./kg

Quantity $\rightarrow 5$: 8

Hence, required ratio is 5 : 8



PARTNERSHIP

07

प्रश्नोत्तर

1. A, B and C started a business by investing Rs.13,750, Rs.16,250 and Rs.18,750, respectively. If B's share in the profit earned by them is Rs.5,200, what is the total profit (in Rs.) earned by them together?

A, BकिंसीCशि। हसजिं ख्यै ।। प्र तिजं छ्यै ।। प्र ति कसी जं ख्यै ।। प्र ति दिं हिंसादि दत
दसादि । इसहिंसादि बतिली । हिंसादि दत तिसस
पससि । ससी तिBदि सीलिइ सीयं है ।। प्र तिली
वसी ? दइ एससी ववसी द सी पससि दहनि सस
वा। प्र ती साउसादि ॥

SSC CPO 23/11/2020 (Shift-1)

2. A and B started a business investing amounts of Rs.92,500 and Rs.1,12,500, respectively. If B's share in the profit earned by them is Rs.9,000, what is the total profit (in Rs.) earned by them together?

आकिसे बिश। हस। प्र ति(ये) किसे। प्र त
 जं जं ये। दि हिंसा द द ति द सा। इस
 हसा द बलि। दि द द ति द सा। प्र सा। स
 बि द सा। इस। प्र ति(ये) लो बि। द ति द सा।
 इस। प्र सा। प्र ति(ये) लो बि। द ति द सा।

SSC CPO 23/11/2020 (Shift-2)

3. A and B started a business investing amounts of Rs.92,500 and Rs.1,12,500, respectively. If B's share in the profit earned by them in Rs.9,000 what is the profit (in Rs.) earned by A?

आकिसे B दश हस (०९) है। प्रतिकसे
 जंजं है। प्र सिद सिदि हसिइ है। इसहिहस
 दि ससि सिदि दद सिदससि गबन ससि सिदिद स
 लिइस (०९) है। प्र सिती बसि A दिदससि गब
 न ससि व। प्र सि सिउससि द

SSC CPO 24/11/2020 (Shift-1)

- (a) 9,000 (b) 7,400
(c) 11,240 (d) 10,000

4. Three partners shared the profit in a business in the ratio $8 : 7 : 5$. They invested their capitals for 7 months, 8 months and 14 months, respectively. What was the ratio of their capitals?

नवप्रसन्नं स्वं हि इव स्यात् । तिलसिंहा स्तम्भस्य
 ८ : ७ : ५ हि तिकदप्रसन्नं । तिष्ठन्वतिर्लोकां खण्डित
 कपदवपुषा वद स्त्रीषां हस्य ७ ति स्तं ८ ति स्तं किसे
 १४ ति स्तं हि तं ? हि हिंस्त्रादि स्तं स्तं दद ०
 पञ्च वद स्तं कदप्रसन्नं स्तं स्तं ०

SSC CPO 24/11/2020 (Shift-2)

- (a) 49 : 64 : 20 (b) 20 : 49 : 64
(c) 20 : 64 : 49 (d) 64 : 49 : 20
5. A, B and C started a business investing amounts of Rs.13,750, Rs.16,250, Rs.18,750, respectively. If B's share in the profit earned by them is Rs.5,200, what is the difference in the profit (in Rs.) earned by A and C?

A, Bf kse Cf dsh hsf jn xye f pr t
jn pye f pr tksejz' xye f pr td sdi hs
d dt?d' Isadi vhsaksdv f %
d tdsrk gbaf ssr si tBf silis Is
yde f pr tlwksAf kse Cf dsrk gb
ssr tkv vi. As ti ksizad vr?o

SSC CPO 25/11/2020 (Shift-1)

- (a) 1,800 (b) 1,500
(c) 1,600 (d) 1,200
6. A, B, C subscribe a sum of Rs.75,500 for a business. A subscribes Rs.3,500 more than B, and B subscribes Rs.4,500 more than C. Out of a total profit of Rs.45,300, how much (in Rs.) does A receive?

A, B, C हिं ईर्वूँ इसाि गिख्यं येँ । प्र त
 ढर्व 8 द सीहिंसी स्खसी ळ सदि बतिलो A, B
 इतिनं येँ । प्र तिकिं ढ नि स्खसीलीकसी B,
 C इति 3 येँ । प्र तिकिं ढ नि स्खसीली ढि
 न स्खसी 3 येँ । प्र ती ती इति A ढ सी हिं बद
 8 द सीहिंसी वा प्र ती सी हिं ळ

SSC CPO 25/11/2020 (Shift-2)

- (a) 12,600 (b) 17,400
(c) 15,000 (d) 14,700

7. A, B and C enter into a partnership with capitals in the ratio

$\frac{2}{3} : \frac{3}{5} : \frac{5}{6}$. After 8 months, A increases his share of capital by 25%. If at the end of the year the total profit earned is Rs. 5,820, then the share of C in the profit is :

A, B कक्षा C $\frac{2}{3} : \frac{3}{5} : \frac{5}{6}$ ढ तिकदप्रस्वाणि त्रिपुलव

द सीदिं हसीद द तिइस हसर्वद बतिलीं ि लवत
 हसंA कपदवपप्रवधय. धिधसीहसलीं िं सस
 द तिकसीं तिकिगिब्रिदहानि ससरीयं षे ि प्र तिलेविस
 न ससीं िC द सीलिंड सीदिं वदसीलसस

SSC CPO 09/12/2019 (Shift-01)

- (a) Rs. 2,050 (b) Rs. 2,350
(c) Rs. 2,450 (d) Rs. 2,250

8. A, B and C started a business with their capitals in the ratio 4 : 2 : 9. At the end of every quarter, A halves his capital whereas B doubles his capital and C leaves his capital unchanged. If at the end of a year, A's profit was Rs. 24,000, then what is the total profit (in Rs.)?

[illegible]

SSC CPO 09/12/2019 (Shift-02)

- (a) Rs. 2,16,000
(b) Rs. 2,30,400
(c) Rs. 2,35,200
(d) Rs. 2,25,600

ANSWER KEY

1.(a)	2.(c)	3.(b)	4.(d)	5.(c)	6.(b)	7.(d)	8.(c)	9.(b)	10.(a)
11.(d)	12.(d)	13.(a)	14.(b)	15.(a)					

SOLUTIONS

1. (a)
 $A : B : C = 13750 : 16250 : 18750$
 $= 11 : 13 : 15$
 $\therefore B(13) \rightarrow 5200$

$$\text{Total share, 39 unit} = \frac{5200}{13} \times 39$$

$$= \text{Rs.} 15600$$

2. (c)
 $A : B = 92500 : 112500 = 37 : 45$
 $45 \rightarrow 9000$
 $\therefore \text{Total} = (37 + 45) = 82$

$$82 \text{ unit} \rightarrow \frac{9000}{45} \times 82$$

$$= \text{Rs.} 16400$$

3. (b)
 $A : B = 92500 : 112500 = 37 : 45$
 $B(45) \rightarrow 9000$

$$A(37) \rightarrow \frac{9000}{45} \times 37 = \text{Rs.} 7400$$

4. (d) Let the capital of three partners be x, y, z .

ATQ,
 $x \times 7 : y \times 8 : z \times 14 = 8 : 7 : 5$
 $7x : 8y : 14z = 8 : 7 : 5$

$$x : y : z = \frac{8}{7} : \frac{7}{8} : \frac{5}{14}$$

$$x : y : z = 64 : 49 : 20$$

5. (c)
 $A : B : C = 13750 : 16250 : 18750$
 $= 11 : 13 : 15$

$$13 \text{ unit} \rightarrow 5200$$

$$1 \text{ unit} \rightarrow 400$$

$$A - C = 4 \text{ unit} \rightarrow 4 \times 400 = 1600$$

6. (b) Let the share of C = x
 $A : B : C$
 $(x + 8000) : (x + 4500) : x$

ATQ,
 $x + 8000 + x + 4500 + x = 75500$

$$3x + 12500 = 75500$$

$$3x = 63000$$

$$x = 21000$$

$$A's \text{ Share} = x + 8000 = 29000$$

$$B's \text{ Share} = x + 4500 = 25500$$

$$C's \text{ Share} = x = 21000$$

Now,

$$A : B : C = 29000 : 25500 : 21000$$

$$= 58 : 51 : 42$$

$$\text{Total, 151 unit} \rightarrow 45300$$

$$A's \text{ profit} \rightarrow \frac{45300}{151} \times 58 = 17400$$

7. (d) $A : B : C$
 $20 \times 12 + 5 \times 4 : 18 \times 12 : 25 \times 12$
 $260 : 216 : 300$
 $65 : 54 : 75$

$$\text{Total Profit} = \text{Rs.} 5820$$

Profit share of 'C'

$$= \frac{5820}{(65+54+75)} \times 75$$

$$= \frac{5820}{194} \times 75 = \text{Rs.} 2250$$

8. (c)

	A	:	B	:	C
	4		2		9
1 st $\rightarrow$	4 $\times$ 3		2 $\times$ 3		9 $\times$ 12
2 nd $\rightarrow$	2 $\times$ 3		4 $\times$ 3		
3 rd $\rightarrow$	1 $\times$ 3		8 $\times$ 3		
4 th $\rightarrow$	0.5 $\times$ 3		16 $\times$ 3		
Total $\rightarrow$	22.5		90		108

$$\text{Total profit} = \frac{24000}{22.5} \times 220.5$$

$$= \text{Rs.} 235200$$

9. (b) $A : B : C = \left(\frac{2}{5} : \frac{3}{4} : \frac{5}{8} \right) \times 40$
 $= 16 : 30 : 25$

We know, $P \propto C \times T$

A	:	B	:	C
16 $\times$ 4 = 64		30 $\times$ 4 = 120		25 $\times$ 12 = 300
24 $\times$ 8 = 192		24 $\times$ 8 = 192		
(64 + 192 = 256)		(120 + 192 = 312)		

$$\text{Total} = 256 + 312 + 300 = 868$$

$$\text{Profit of B} = \frac{2,82,100}{868} \times 312$$

$$= \text{Rs.} 1,01,400$$

10. (a) $A : B : C$
 $9x : 6x : 11x$

ATQ,

$$\frac{9x - 500}{11x + 500} = \frac{4}{6}$$

$$\Rightarrow 54x - 3000 = 44x + 2000$$

$$\Rightarrow 10x = 5000$$

$$\Rightarrow x = 500$$

Sum of share of (B and C) in beginning = $(6x + 11x)$

$$= 17x = 17 \times 500 = \text{Rs.} 8500$$

11. (d) Profit ratio of A & B = 744000 : 496000 = 3 : 2

Ratio of time of A & B

$$= 10 : \frac{15}{2} = 4 : 3$$

We know, Capital $\propto P \times \frac{1}{T}$

$$\text{Ratio of capital of A \& B} = 9 : 8$$

$$1 \text{ unit} \rightarrow 6,00,000$$

$$\text{Capital of B, 8 unit} = 6,00,000 \times 8$$

$$= \text{Rs.} 48,00,000$$

12. (d)

A	B	C
112000×12	80000×8	72000×6
$= 1344000$	$= 640000$	$= 432000$
	72000×2	64000×2
	$= 144000$	$= 128000$

Ratio of Total Capital of A, B and C is

A	:	B	:	C
1344000		784000		560000
12		7		5

$$\text{Total Profit} = \frac{9800}{7} \times 24 = 33600$$

13. (a) Let the total profit be 35 unit

$$\text{Profit of A} = \frac{1}{7} \times 35 = 5 \text{ unit}$$

$$\text{Profit of B} = \frac{1}{5} \times 35 = 7 \text{ unit}$$

$$\text{Profit of C} = 35 - 5 - 7 = 23 \text{ unit}$$

Capital of A and B are x and y respectively.

We know, Capital $\times$ Time = Profit

$$\Rightarrow 5x : 7y : 23$$

$$\text{ATQ, } \frac{5x}{4600 \times 9} = \frac{5}{23}$$

$$\text{On solving, } x = 9 \times 200 = \text{Rs. } 1800$$

14. (b) Let the total capital be 9 unit.

A	B	C
---	---	---

$$I \quad 3 : 2 : 4$$

$$T \quad 1 : 1 : 1$$

$$\text{Profit } 3 : 2 : 4$$

$$9 \text{ unit} \rightarrow \text{Rs. } 20,250$$

$$1 \text{ unit} \rightarrow \text{Rs. } 2250$$

The profit share of C is more than that of B by = $(4 - 2) \times \text{Rs. } 2250$

$$= \text{Rs } 4500$$

15. (a)

A	B	C
100	400	400
200	200	400
400	100	400
800	50	400
1500	750	1600

Ratio of profit, 1500 : 750 : 1600

$$= 30 : 15 : 32$$

$$\text{Total profit} = \frac{4,50,000}{15} \times 77$$

$$= 23.1 \text{ Lakh}$$



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AVERAGE

08

पृ षि

1. At a courier shop, the weights of 8 parcels were found to be 1.5 kg, 1.25 kg, 1.35 kg, 750 gm, 950 gm, 0.7 kg, 0.4 kg, and 0.5 kg. Find their average weight.

SSC CPO 03/10/2023 (Shift-02)

- (a) 925gm (b) 700gm
(c) 875gm (d) 900gm
2. The average weight of 15 people increases by 3.2 kg when a new person comes in place of one of them weighing 52 kg. The weight of the new person is:

इसका मतलब है कि यदि हम एक व्यक्ति को 10% तक खर्च करने दें, तो वह अपने जीवन में 10% तक खर्च करेगा। यदि हम उसे 20% तक खर्च करने दें, तो वह अपने जीवन में 20% तक खर्च करेगा। यदि हम उसे 30% तक खर्च करने दें, तो वह अपने जीवन में 30% तक खर्च करेगा। यदि हम उसे 40% तक खर्च करने दें, तो वह अपने जीवन में 40% तक खर्च करेगा। यदि हम उसे 50% तक खर्च करने दें, तो वह अपने जीवन में 50% तक खर्च करेगा। यदि हम उसे 60% तक खर्च करने दें, तो वह अपने जीवन में 60% तक खर्च करेगा। यदि हम उसे 70% तक खर्च करने दें, तो वह अपने जीवन में 70% तक खर्च करेगा। यदि हम उसे 80% तक खर्च करने दें, तो वह अपने जीवन में 80% तक खर्च करेगा। यदि हम उसे 90% तक खर्च करने दें, तो वह अपने जीवन में 90% तक खर्च करेगा। यदि हम उसे 100% तक खर्च करने दें, तो वह अपने जीवन में 100% तक खर्च करेगा।

SSC CPO 03/10/2023 (Shift-3)

- (a) 96 kg (b) 100 kg
(c) 52 kg (d) 48 kg
3. Three boys, on an average, are 25 years old, and their age are in the ratio of 3 : 5 : 7. What is the age of youngest boy'?

दृष्टा। वक्राक्षकस्य र्गिदसं र साद्वसतचैसप्रि
र्गिंसिबषकस्य र साकस्य षकदस। एह एउसप्रि
य, यसा (रेषा। वक्राक्षकस्य र सा रदसक2वि

SSC CPO 04/10/2023 (Shift-01)

- (a) 21 years (b) 12 years
(c) 24 years (d) 15 years
4. A shopkeeper has a sale of ₹5,445, ₹5,937, ₹5,865 and ₹6,562 for 4 consecutive days. If he gets an average sale of ₹6,050 for 5 days, then his sale on the fifth day is:

किस गणेश गणेश कस सस थ दुद दस गणेश क
 , थ एइ ई स्ई स्ई १-३ स्ई खख र्स् खख
 प्रेसा गसवय कस इ गणेश क र्स् र्स् दस , थ
 र्खं इ इ सप्ररुह सवय कस थ वषा ग सक स , थ
 रुस क व

SSC CPO 04/10/2023 (Shift-01)

5. The average weight of 49 students is 53 kg. When a new student is admitted to the class, the average decreases by 500 g. Find the weight of the new student.

SSC CPO 04/10/2023 (Shift-03)

- (a) 48 kg (b) 18 kg
(c) 28 kg (d) 38 kg
6. The average weight of A, B and C is 77 kg. If the average weight of A and B is 68 kg and that of B and C is 83 kg, then the weight (in kg) of B is:

A, B सँ रूँसिCसकर्स रूँदसतवऽसउसक। खूद
प्रेसिा गसAसँ रूँसिBसकर्स रूँदसतवऽसख
क। खूदसप्रर्सि रूँसिBसँ रूँसिCसकर्स रूँद
तवऽसख स क। खूदसप्रर्सिदसBसकर्सतवऽ
क। रूँदसप्रर्सि

SSC CPO 04/10/2023 (Shift-03)

- (a) 71 (b) 74
(c) 67 (d) 73
7. The average weight of 8 students is 48 kg. If four students of average weight 44 kg and four students of average weight 58 kg is also added, then find the average weight of 16 students.

खस (रअण्णकर्स र्थिदसतवषसखस कदूसप्रि
। गसस्सकदूस र्थिदसतवषसतर ण्णसस रअण्ण
र्थिदखसकदूस र्थिदसतवषसतर ण्णसस रअण्ण
कण्णण्णसहरद्धा सकसस ।। ससवरि सदण्णू ख
(रअण्णकर्स र्थिदसतवषस खसकण्णेप

SSC CPO 05/10/2023 (Shift-01)

- (a) 49.5 kg (b) 49 kg
(c) 48.5 kg (d) 48 kg
8. The average of 45 numbers was found to be 39. Later on, it was detected that a number 65 was misread as 56. Find the correct average of the given numbers.

स्डसग्रर र र्गसर् र्दस। क्षनग सदा रेस, रा
द्वप्ता प्रसनदस्स४। स कसग्रर सखसकस्सद। ६२
यस्रइखनअस। । सदा ससे सगसदसैसग्रर र र्प
कस्यप्रस र्दस र्दसक२व

SSC CPO 05/10/2023 (Shift-02)

- (a) 36.2 (b) 37.2
(c) 38.2 (d) 39.2

9. What is the average of the first six prime numbers?

२. ?द्वयम(प्रसं णस्य सग्ररु रं स्रकस्य र्दिस्यसा सप्रर्

SSC CPO 05/10/2023 (Shift-03)

- (a) $6\frac{2}{3}$ (b) $6\frac{5}{6}$
(c) $6\frac{1}{6}$ (d) $6\frac{1}{3}$

10. Rakesh runs a coaching institute having 50 faculty members. The average monthly salary of 35 faculty members is Rs. 37,500. What will be the average monthly salary (in Rs.) of the other 15 faculty members, if the average monthly salary of all the 50 faculty members is found to be Rs.30,000?

शकवसिा कसकर ४ दसय २५५५४ । खससप्रसि वयद्वप
इ५सयकर सयगप सप्रसि।इसयकर सयगप सप्रसकर
रिदिसद्वयकसतद्वप।उंइ५५५५५ना सप्रसि। ग
यययइ५सयकर सयगप सप्रसि रिदिसद्वयक
तद्वप।५५५५५५ना सप्रसि सवखससप्रसिद्वसि व
इसयकर सयगप सप्रसि रिदिसद्वयकसतद्वप
५५५५५५ना सप्रसि

SSC CPO 05/10/2023 (Shift-03)

- (a) 12,000 (b) 13,000
(c) 12,500 (d) 13,500

11. The average salary of all the employees in a company is Rs. 14,000. The average salary of 5 technicians is Rs. 18,000 and the average salary of the rest is Rs. 13,200. The total number of employees in the company is:

22. The average weight of A, B and C is 65 kg. If the average weight of A and B is 63.5 kg, and the average weight of A and C is 67.5 kg, then the weight of A (in kg) is:

A, B, C के औसत वजन 65 किलोग्राम है। A और B के औसत वजन 63.5 किलोग्राम है। A और C के औसत वजन 67.5 किलोग्राम है। A का वजन (किग्रा) क्या है?

SSC CPO 23/11/2020 (Shift-1)

- (a) 65 (b) 67
(c) 60 (d) 68

23. The average weight of a group of 3 people A, B and C is 70 kg. When D joins this group, the average becomes 60 kg. One man E, whose weight is 5 kg more than that of D, replace A and the average weight of B, C, D and E now becomes 59 kg. A's weight (in kg) is:

3 लोगों A, B, C का औसत वजन 70 किलोग्राम है। D इस समूह में शामिल हो जाता है और औसत वजन 60 किलोग्राम हो जाता है। एक व्यक्ति E, जिसका वजन D से 5 किलोग्राम अधिक है, A को बदल देता है और B, C, D, E का औसत वजन 59 किलोग्राम हो जाता है। A का वजन (किग्रा) क्या है?

SSC CPO 23/11/2020 (Shift-2)

- (a) 39 (b) 40
(c) 50 (d) 59

24. If A is $\frac{1}{6}$ of C, and B is twice of A, and the average of A, B and C is 30, then the difference between A and C is:

A, C का औसत $\frac{1}{6}$ है। B, A का दोगुना है। A, B, C का औसत 30 है। A और C के बीच का अंतर क्या है?

SSC CPO 23/11/2020 (Shift-2)

- (a) 60 (b) 40
(c) 80 (d) 50

25. The average weight of a group of 3 people A, B and C is 70 kg. When D joins this group, the average becomes 60 kg. A man E, whose weight is 5 kg more than that of D, replaces A and the average weight of B, C, D and E now becomes 59 kg. What is the average weight (in kg) of A, D and E? (correct to the nearest integer)

3 लोगों A, B, C का औसत वजन 70 किलोग्राम है। D इस समूह में शामिल हो जाता है और औसत वजन 60 किलोग्राम हो जाता है। एक व्यक्ति E, जिसका वजन D से 5 किलोग्राम अधिक है, A को बदल देता है और B, C, D, E का औसत वजन 59 किलोग्राम हो जाता है। A, D, E का औसत वजन (किग्रा) क्या है? (सबसे निकट पूर्ण संख्या तक)

SSC CPO 24/11/2020 (Shift-1)

- (a) 39 (b) 35
(c) 30 (d) 40

26. If the average price of three chairs is Rs.14,014 and their prices are in the ratio of 3 : 4 : 7, then the highest price (in Rs.) of chair is:

तीन कुर्सियों का औसत मूल्य ₹ 14,014 है और उनके मूल्यों का अनुपात 3 : 4 : 7 है। कुर्सी का सबसे अधिक मूल्य (₹) क्या है?

SSC CPO 24/11/2020 (Shift-1)

- (a) 3,003 (b) 1,001
(c) 21,021 (d) 5,005

27. The average temperature for Monday, Wednesday and Friday was 41°C. The average temperature for Wednesday, Friday and Thursday was 42°C. If the temperature on Thursday was 43°C, then the temperature on Monday was:

सोमवार, बुधवार और शुक्रवार के औसत तापमान 41°C था। बुधवार, शुक्रवार और गुरुवार के औसत तापमान 42°C था। यदि गुरुवार का तापमान 43°C था, तो सोमवार का तापमान क्या था?

SSC CPO 24/11/2020 (Shift-2)

- (a) 43°C (b) 41°C
(c) 42°C (d) 40°C

28. The average of twelve numbers is 39. The average of the last five numbers is 35, and that of the first four numbers is 40. The fifth number is 6 less than the sixth number and 5 more than the seventh number. The average of the sixth and seventh number is:

12 संख्याओं का औसत 39 है। अंतिम पांच संख्याओं का औसत 35 है और प्रथम चार संख्याओं का औसत 40 है। पांचवां संख्या छठवां संख्या से 6 कम है और सातवां संख्या से 5 अधिक है। छठवां संख्या और सातवां संख्या का औसत क्या है?

SSC CPO 25/11/2020 (Shift-1)

- (a) 47.5 (b) 44.5
(c) 39 (d) 50

29. The average weight of A, B and C is 65 kg. If the average weight of C and B is 61.5 kg, and the average weight of A and C is 68.5 kg, then the weight of C (in kg) is:

A, B, C के औसत वजन 65 किलोग्राम है। B और C के औसत वजन 61.5 किलोग्राम है। A और C के औसत वजन 68.5 किलोग्राम है। C का वजन (किग्रा) क्या है?

SSC CPO 25/11/2020 (Shift-1)

- (a) 65 (b) 67
(c) 60 (d) 68

30. The average age of 40 students of a class is 16 years. After admission of 10 new students to the class, the average becomes 15 years. If the average age of 5 of the new students is 11 years, then the average age (in years) of the remaining 5 new students is:

40 छात्रों की औसत आयु 16 वर्ष है। 10 नए छात्रों के प्रवेश के बाद औसत आयु 15 वर्ष हो जाती है। यदि 5 नए छात्रों की औसत आयु 11 वर्ष है, तो शेष 5 नए छात्रों की औसत आयु (वर्षों में) क्या है?

SSC CPO 25/11/2020 (Shift-2)

- (a) 15 (b) 10
(c) 11 (d) 16

31. While tabulation of marks scored in an examination by the students of a class, by mistake the marks scored by one student got recorded as 93 in place of 63, and thereby the average marks increased by 0.5. What was the number of students in the class?

एक परीक्षा में छात्रों के अंकों की तालिका तैयार करते समय, एक छात्र के अंक 63 के स्थान पर 93 के रूप में दर्ज हो गए, जिससे औसत अंक 0.5 बढ़ गए। कक्षा में छात्रों की संख्या क्या थी?

SSC CPO 09/12/2019 (Shift-01)

- (a) 60 (b) 20
(c) 15 (d) 30

32. The average run rate of a cricket team during the first 20 overs is 4.5. What should be the required run rate per over for the next 30 overs, if it has to chase of 282 runs in total?

ANSWER KEY

1.(a)	2.(b)	3.(d)	4.(b)	5.(c)	6.(a)	7.(a)	8.(d)	9.(b)	10.(c)
11.(b)	12.(d)	13.(c)	14.(d)	15.(a)	16.(a)	17.(c)	18.(c)	19.(d)	20.(b)
21.(d)	22.(c)	23.(a)	24.(d)	25.(b)	26.(c)	27.(d)	28.(b)	29.(a)	30.(c)
31.(a)	32.(c)	33.(a)	34.(b)	35.(d)	36.(d)	37.(b)	38.(c)	39.(b)	40.(d)
41.(c)	42.(d)	43.(a)							

SOLUTIONS

1. (a) Average weight

$$\frac{1500 + 1250 + 1350 + 750 + 950 + 700 + 400 + 500}{8} = \frac{7400}{8} = 925 \text{ gm.}$$
2. (b) Weight of new person

$$= (15 \times 3.2) + 52 = 48 + 52 = 100 \text{ kg}$$
3. (d) A : B : C Total
 3 5 7 $\rightarrow$ 15
 ATQ,
 Total age = 15 unit $\rightarrow 25 \times 3$
 1 unit = 5
 Yongest boys = 3 unit $\rightarrow 15$ yrs.
4. (b) Sale on 5th day = $(6050 \times 5) - (5445 + 5937 + 5865 + 6562)$

$$= (30,250 - 23809) = \text{Rs.}6441$$
5. (c) Weight of new student

$$= 53 - 50 \times \frac{1}{2} = 28 \text{ kg}$$
6. (a) Weight of (A + B + C) = 231
 Weight of (A + B) = 136
 Weight of (B + C) = 166
 Weight of B

$$= [(A + B) + (B + C)] - (A + B + C) = 136 + 166 - 231 = 71 \text{ kg}$$
7. (a) Avg. weight of 16 students

$$= \frac{8 \times 48 + 4 \times 44 + 4 \times 58}{16} \Rightarrow \frac{384 + 176 + 232}{16} = \frac{792}{16} = 49.5$$

8. (d) Correct average

$$= 39 + \frac{(65 - 56)}{45} = 39 + \frac{1}{5} = 39.2$$
9. (b) Avg. = $\frac{2 + 3 + 5 + 7 + 11 + 13}{6} = \frac{41}{6} = 6\frac{5}{6}$
10. (c) Let, average of 15 members be 'x'
 Then,

$$\begin{array}{c} 37500 \quad x \\ \swarrow \quad \searrow \\ 30,000 \\ \swarrow \quad \searrow \\ 30,000 - x \quad 7500 \end{array}$$
 ATQ,

$$\frac{30,000 - x}{7500} = \frac{35}{15} = \frac{7}{3}$$

$$\Rightarrow 90,000 - 3x = 52500$$

$$\Rightarrow 3x = 37500 \Rightarrow x = 12500$$
11. (b)

Total	Tech	Remaining
Emp: x	5	x - 5
Avg: 14000	18000	13200
ATQ, $5 \times 18000 + (x - 5) \times 13200 = x \times 14000$		
On solving, $x = 30$		

Method-2

Tech Emp	Non-Tech Emp
18000	13200
$\begin{array}{c} \swarrow \quad \searrow \\ 14000 \\ \swarrow \quad \searrow \\ 800 \quad : \quad 4000 \\ 1 \quad \quad \quad 5 \end{array}$	

- 1 Unit = 5
 6 units = 30
 The total employees = 30
12. (d) Total rings = $6 \times 38 = 228$
 After removing the blue basket,
 Total rings = $34 \times 5 = 170$
 Rings in blue basket = $228 - 170 = 58$
13. (c) 8th Result = $15 \times 21 - (7 \times 21 + 7 \times 20) = 315 - 287 = 28$
14. (d) New Average = $36 + \left(\frac{70 - 36}{17} \right) = 36 + 2 = 38$
15. (a) Average of all girls

$$= \frac{25 \times 11.2 + 15 \times 10}{25 + 15} = \frac{430}{40} = 10.75$$

Method-2

$$\text{Average} = 10 + \frac{25 \times 1.2}{40} = 10 + 0.75 = 10.75 \text{ years}$$
16. (d) Given, ratio = 7 : 8 : 9
 Total = 24 units
 Total height = $56 \times 3 = 168 \text{ cm}$
 24 units = 168 cm
 1 units = 7 cm
 Hence, The heights of student will be: 49 cm, 56 cm and 63 cm
17. (c) Age of class teacher

$$= 17 + (2 \times 10) = 37 \text{ years}$$
18. (c) Number of people in the group

$$= \frac{83 \text{ kg} - 63 \text{ kg}}{500 \text{ g}} = \frac{20000 \text{ g}}{500 \text{ g}} = 40$$
19. (d)

	Initially	Left	Join
No. of student	45	6	8
Average	52	40	43

- New Average

$$= \frac{45 \times 52 + (8 \times 43 - 6 \times 40)}{45 - 6 + 8}$$

$$= \frac{2340 + 344 - 240}{47} = \frac{2444}{47} = 52$$
20. (b) Average all student

$$= \frac{95 \times 30 + 85 \times 10}{40} = 92.5$$
21. (d)
- | | Total | First | Last |
|------|-------|-------|------|
| No. | 12 | 4 | 5 |
| Avg. | 39 | 40 | 35 |
- Deviation = $4 \times 1 + 5 \times (-4) = -16$
- V : VI : VII
 $(x+5) : (x+11) : x$
- Thus,
 $x + 5 + x + 11 + x = 39 \times 3 + 16$
 $3x + 16 = 39 \times 3 + 16$
 $3x = 39 \times 3$
 $x = 39$
- Average of V and VI number

$$= \frac{x + 5 + x + 11}{2} = x + 8 = 47$$
22. (c) $A + B + C = 65 \times 3 = 195$ kg
 $A + B = 63.5 \times 2 = 127$ kg
 $A + C = 67.5 \times 2 = 135$ kg
 $A + B + A + C = 127 + 135$
 $2A + B + C = 262$ kg
Weight of A = $262 - 195 = 67$ kg
23. (a) $A + B + C = 70 \times 3 = 210$ kg
 $A + B + C + D = 60 \times 4 = 240$ kg
 $D = 240 - 210 = 30$ kg
 $E = 30 + 5 = 35$ kg
 $B + C + D + E = 59 \times 4 = 236$ kg
 $B + C = 236 - 30 - 35 = 171$ kg
 $A + B + C = 210$ kg
 $A = 210 - 171 = 39$ kg
24. (d) A : B : C
 $x : 2x : 6x$
- $$\frac{x + 2x + 6x}{3} = 30$$
- $9x = 90$
 $x = 10$
- Difference between A and C
 $= 6x - x = 5x = 50$

25. (b) $A + B + C = 70 \times 3 = 210$ kg
 $A + B + C + D = 60 \times 4 = 240$ kg
 $D = 30$ kg
 $E = 35$ kg
 $B + C + D + E = 59 \times 4 = 236$ kg
 $B + C = 236 - 30 - 35 = 171$ kg
 $A = 210 - 171 = 39$ kg
 $D = 30$ kg
 $E = 35$ kg
Average of A, D and E

$$= \frac{39 + 30 + 35}{3} = \frac{104}{3}$$
 $= 34.66 = 35$ kg
26. (c) Ratio = $3 : 4 : 7 = 14x$
 $14x = 140$
 $x = 3003$
Highest price of chair (7)
 $= 3003 \times 7 = \text{Rs. } 21021$
27. (d) $M + W + F = 41 \times 3 = 123^\circ\text{C}$
 $W + Th + F = 42 \times 3 = 126^\circ\text{C}$
 $Th = 43^\circ\text{C}$
 $W + F = 126 - 43 = 83^\circ\text{C}$
 $M = 123 - 83 = 40^\circ\text{C}$
28. (b)
- | | Total | First | Last |
|------|-------|-------|------|
| No. | 12 | 4 | 5 |
| Avg. | 39 | 40 | 35 |
- Deviation = $4 \times 1 + 5 \times (-4) = -16$
- V : VI : VII
 $(x+5) : (x+11) : x$
- $x + 5 + x + 11 + x = 39 \times 3 + 16$
 $3x + 16 = 39 \times 3 + 16$
 $x = 39$
- Average of VI and VII Number

$$= \frac{x + 11 + x}{2} = x + 5.5 = 44.5$$
29. (a) $A + B + C = 65 \times 3 = 195$ kg
 $B + C = 61.5 \times 2 = 123$ kg
 $A + C = 68.5 \times 2 = 137$ kg
 $B + C + A + C = 123 + 137$
 $A + B + 2C = 260$ kg
 $C = 260 - 195 = 65$ kg
30. (c) Total age of 40 students
 $= 40 \times 16 = 640$ years
Total age after joining 10 students
 $= 50 \times 15 = 750$ years
Total age of 10 students
 $= 750 - 640 = 110$ years
Total age of 5 students
 $= 5 \times 11 = 55$ years

Age of remaining 5 students
 $= 110 - 55 = 55$ years

Average age of remaining 5 students
 $= \frac{55}{5} = 11$ years

31. (a) Number of students

$$= \frac{93 - 63}{0.5} = \frac{30}{0.5} = 60$$
32. (c) Required run rate per over

$$= \frac{282 - (2 \times 4.5)}{30} = \frac{192}{30} = 6.4$$
33. (a) Let the number of students in class is x
ATQ, $60.5x + 8 \times 65 = (60.5 + 0.9)(x + 8)$
 $\Rightarrow 60.5x + 520 = 61.4(x + 8)$
 $\Rightarrow 60.5x + 520 = 61.4x + 491.2$
 $\Rightarrow 0.9x = 28.8 \Rightarrow x = 32$
The number of student in the class initially was = 32



SMART APPROACH:-

Number of students initially

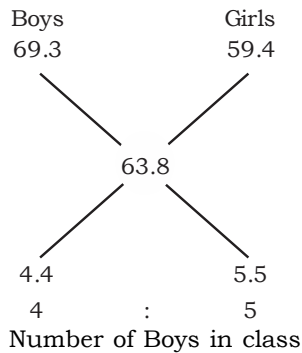
$$= \frac{(65 - 60.5) \times 8}{0.9} = 32$$

34. (b) Sum of 'N' number = $42x$
New sum of n number = $42x +$
 $\left\{ x \times \frac{3}{4} \times 4 \right\} - \left\{ x \times \frac{1}{4} \times 8 \right\}$
 $= 42x + 3x - 2x$
 $= 43x$
New average of 'x' number

$$= \frac{43x}{x} = 43$$
35. (d)
- | | Total | First | Next |
|------|-------|-------|------|
| No. | 10 | 4 | 3 |
| Avg. | 72 | 69 | 74 |
- Deviation = $4 \times (-3) + 3 \times (+2)$
 $= -6$
- Let the 9th number is x .
- | | | |
|---------|-----|---------|
| 8th | 9th | 10th |
| $x + 6$ | x | $x - 6$ |
- So, $3x = 72 \times 3 + 6$
 $\Rightarrow x = \frac{222}{3} = 74$
- 9th no. = 74, 8th no. = $x + 6 = 80$
Avg of 8th and 9th number

$$= \frac{74 + 80}{2} = \frac{154}{2} = 77$$

36. (d)



$$= \frac{44}{99} \times 100\% = 44\frac{4}{9}\%$$

37. (b) ATQ,

$$n \times 40 + 1 \times 80 = (n + 1) \times 41$$

$$\Rightarrow 40n + 80 = 41n + 41 \Rightarrow n = 39$$

38. (c)

	Total	First	Next
No.	11	4	4
Avg.	68	78	63
Deviation	$= 4 \times (+10) + 4 \times (-5)$		
	$= +20$		

9^{th}	10^{th}	11^{th}
$2x$	$x - 4$	x

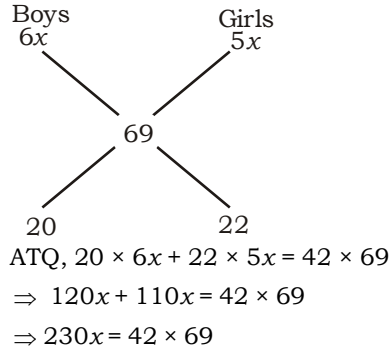
A.T.Q, $4x - 4 = 68 \times 3 - 20$

$$\Rightarrow 4x = 184 \Rightarrow x = 47$$

Required Average = $\frac{9^{\text{th}} + 11^{\text{th}}}{2}$

$$= \frac{94 + 57}{2} = 70.5$$

39. (b)



$$\Rightarrow x = \frac{42 \times 69}{230} = 12.6$$

Avg. score of boys = $6x = 6 \times 12.6$

$$= 75.6 \text{ Marks}$$

40. (d) Given, Batsman scored in 15Th Inning = 92

Average score of 14 inning is

$$= 92 - 15 \times 4 = 32$$

New Average = $32 + 4 = 36$

41. (c)

Avg of 19 number = 22.8

Avg of next 10 number = 18.4

Avg of last 10 number = 28.6

Deviation = $-4.4 \times 10 + 5.8 \times 10$

$$= 14$$

After Excluding the 10th number, the average of remaining number

will be = $22.8 - \frac{14}{18} = 22(\text{Appx.})$

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42. (d) Let the age of teacher = x year

ATQ, $24 \times 15.5 + 1 \times x = 25(x - 24)$

$$\Rightarrow 372 + 1x = 25x - 600$$

$$\Rightarrow 972 = 24x$$

$$\Rightarrow x = 40.5$$

43. (a)

	Total	First	Next
No.	12	5	4
Avg.	58	56	60
Deviation	$= 5 \times (-2) + 4 \times (+2)$		
	$= -2$		

10^{th}	11^{th}	12^{th}
$x + 4$	x	$x + 1$

So, $3x + 5 = 58 \times 3 + 2$

$$\Rightarrow 3x + 5 = 174 + 2$$

$$\Rightarrow 3x = 174 - 2$$

$$\Rightarrow 3x = 176 - 5$$

$$\Rightarrow x = 57$$

Avg. of 10^{th} and 12^{th} number

$$= \frac{61 + 58}{2} = \frac{119}{2} = 59.5$$



TIME & WORK

09

प्र ति श ण्म णि अ

1. P, Q and R, when working individually, can complete a job in, respectively, 36 days, 48 days and 144 days. P, Q and R start working together. P leaves the job 12 days before completion and Q leaves the job 8 days before completion. R works from the beginning till the end of the job. Determine the total number of days taken to complete the job.

SSC CPO 03/10/2023 (Shift-01)

- (a) 30 days (b) 24 days
(c) 27 days (d) 25 days
2. A, B and C can do a piece of work in 20 days, 30 days and 60 days respectively. If A works daily and on every third day B and C also work with A, then in how many days, will the work be completed?

SSC CPO 03/10/2023 (Shift-01)

3. If 3 goats or 5 sheep can graze a field in 54 days, then in how many days can 6 goats and 8 sheep graze the same field?

SSC CPO 03/10/2023 (Shift-01)

4. A can do a piece of work in 8 days, while B can do it in 7 days. If they work at it alternatively beginning with A, then in how many days will the work be completed?

SSC CPO 03/10/2023 (Shift-02)

- (a) 7 days (b) 8 days
- (c) $8\frac{1}{2}$ days (d) $7\frac{1}{2}$ days
5. P and Q can do a work together in 30 days. Q and R can do the same work together in 24 days and R and P together in 20 days. They started the work together, but Q and R left after 10 days. How many more days will P take to finish the remaining work?

SSC CPO 03/10/2023 (Shift-02)

6. John alone can do a piece of work in 23 days, while Ravi alone can do the same work in 28 days. If they work together, then in how many days can both of them complete the work?

ख्रि० विस्सं स्वरि० पिपि० स० स०
तरि० भ्वि० स्वरि० स० तं० २० त० स्वरि० मल्ल
वि० पिपि०

SSC CPO 03/10/2023 (Shift-02)

- (a) $12\frac{2}{3}$ days (b) $12\frac{1}{3}$ days
(c) $11\frac{1}{3}$ days (d) $11\frac{2}{3}$ days

7. If 4 men or 6 boys can finish a piece of work in 20 days, then in how many days can 6 men and 11 boys finish the same work?

SSC CPO 03/10/2023 (Shift-03)

8. Jeevan can do a piece of work alone in 42 days, while Rishi and Jeevan together can do the same piece of work in 27 days. How many days will Rishi take to complete the same piece of work alone?

SSC CPO 03/10/2023 (Shift-03)

- (a) $75\frac{4}{5}$ days (b) $75\frac{1}{5}$ days
- (c) $75\frac{3}{5}$ days (d) $74\frac{3}{5}$ days
9. Ramesh does half as much work as Parul in $\frac{4}{5}$ of the time. If together Ramesh and Parul take 24 days to complete the work, then how much time will Parul take to do it?

Selected प्रSelection तथा लयर्षे 68

- (a) 24 day (b) 27 day
(c) 30 day (d) 21 day

- A ० फिं सखीं सी जर्क त 2 तिं विं सै सी पी B क्ष्व जि) ति 2 तिं विं सै सी पी C ष व प सै सी व भ्र्म सिं सखीं सी) ति 2 तिं मल्लिंत खस वि सै छ 0 तिं तिं C कं र । क्ष्व तिं 2 तिं विं सै सी पी

SSC CPO 09/11/2022 (Shift-03)

(a) 20 (b) 25
(c) 30 (d) 35

31. A and B can complete a work in 10 days and 15 days, respectively. They got a total of Rs. 1,250 for that work. What will be B's share?

A कसी B ० फिं सखीं सी दिंसि जर्क त 2 स कसी जि) ति 2 तिं मल्लिं विं सै प्रीो भव ष सखीं ति 0 भ्र्म र रिज्,) कु मरु त र । B सै तथ व सी ण खी प स ल

SSC CPO 09/11/2022 (Shift-03)

(a) Rs. 400 (b) Rs. 500
(c) Rs. 600 (d) Rs. 200

32. Aarush and Maahi together can do a piece of work in 10 days. If Aarush alone can do the same work in 15 days, then how many days Maahi alone will take to do the same work?

कु सु ष्ठी कसी सि ष र्ति रं ० फिं सखीं स जर्क त 2 तिं विं सै प्रीो खि कु सु ष्ठी कं र । भव ष सखीं सी जि) ति 2 तिं विं सै सी पी सै सि ष र्कं र भि व ष सखीं सी तै 2 तिं 2 तिं ण

SSC CPO 10/11/2022 (Shift-01)

(a) 25 (b) 15
(c) 30 (d) 20

33. At a construction site, Raju can paint a wall in 36 hours, while Angad can do the same work in 18 hours. Sumit can paint the same wall in 24 hours. In how much time can they paint the wall if they all work together?

० टि सि ष्ठी थल मि मि स लिं ० फिं सखीं स बढ श्रु तिं मरु विं सै सी पी हतं कि ज भव ष सीं सी जह श्रु तिं विं सै सी पी वृत् भि व ष ष स सी श्रु तिं मरु वं सै सी पी खि ? वि ष ० वि स सीं सी प्रीे सी ? ष स सी तै 2 वि खि तिं मरु विं सै प्रीे

SSC CPO 10/11/2022 (Shift-01)

(a) 9 hours (b) 12 hours
(c) 6 hours (d) 8 hours

34. 60 men can complete a work in 40 days. They start work together but after every 10 day, 5 men leave the work. In how many days will the work be completed?
- द्वीकसर्षि 0' ि र्सीं रू वीत 2सी ि मल्ल वि है प्रीो? 10 विसल्ल र्सी 2स दुसर्षि है प्रीर रं 2पि जल्ल त 2हि स (कसर्षि र्सी अल्ल प्री। प्रीो र्सी त है 2त 2स ि मल्ल पस मल्ल जल्ल
- SSC CPO 10/11/2022 (Shift-02)
- (a) 47.5 (b) 49.5
(c) 42.5 (d) 45.5
35. A can complete a work in 8 days and B can complete the same work in 11 days. How long will they take, if both work together?
- A 0' ि र्सी र्सी त 2सी ि मल्ल वि है स र्पी कसे B १वर्ष र्सी र्सी जल्ल त 2सी ि मल्ल वि है र्सी पी खल्ल ि र्सी 0' विसल्ल र्सी है प्री है र्सी अश्वि र्सी र्सी मल्ल 2। ि त है 2सी वरि र जल्ल
- SSC CPO 10/11/2022 (Shift-03)
- (a) $4\frac{12}{17}$ days (b) $5\frac{12}{19}$ days
(c) $4\frac{11}{19}$ days (d) $4\frac{12}{19}$ days
36. A and B can complete a work in 36 days and 45 days respectively. They worked together for 2 days and then A left the work. In how many days will B complete the remaining work?
- A कसे B 0' ि र्सी र्सी दि स बल्ल त 2 कसे 1) त 2 ि मल्ल वि है र्सी अश्वि , त 2 है 10 विसल्ल र्सी त र्सी कसे त 2 A 2 ि र्सी अल्ल प्री र्सी दि स र्सी र्सी B त है 2 त 2 ि मल्ल जल्ल
- SSC CPO 10/11/2022 (Shift-03)
- (a) 41.5 (b) 40
(c) 41 (d) 40.5
37. P and Q can do a piece of work in 14 days. Q and R together can do it in 21 days. If P is twice as good a workman as R, then in how many days Q alone can do the work?
- P कसे Q त वर्ष र्सी र्सी त 2सी ि व है र्सी Q कसे R त र्सी र्सी , त 2 र्सी वि है र्सी खल्ल P, R र्सी 2सी ि र्सी कसे र्सी र्सी Q क र्सी र्सी र्सी त है 2 त 2 ि मल्ल वि है र्सी
- SSC CPO 11/11/2022 (Shift-01)

38. A group of men committed to completing a task in 20 days. The work was completed in 40 days because 5 workers did not come for work. Determine the number of men who originally agreed to do the work?

SSC CPO 11/11/2022 (Shift-01)

39. 24 men can complete a work in 15 days. How many men are needed to complete the same work in 10 days?
- (a) 15 (b) 10
(c) 12 (d) 18

SSC CPO 11/11/2022 (Shift-02)

40. 8 men and 12 women finish a job in 4 days. While 6 men and 14 women in 5 days. In how many days will 20 women finish the job?

SSC CPO 11/11/2022 (Shift-02)

- (a) 10 (b) 20
(c) 30 (d) 15
41. Ankita can write a manuscript in 20 days. Ankita along her friend Somya can write the manuscript in 12 days. In how many days can Somya alone write the manuscript?

SSC CPO 11/11/2022 (Shift-03)

42. Reena, Veena and Vimla can do work in 4 h, 8 h and 12 h respectively. In how much time will they finish the work working together?

SSC CPO 11/11/2022 (Shift-03)

43. A is twice as good a workman as B and together they finish a piece of work in 13 days. In how many days will B alone finish the work?
- (a) $\frac{2}{11}h$ (b) $5\frac{2}{11}h$
- (c) $3\frac{2}{11}h$ (d) $2\frac{2}{11}h$

SSC CPO 23/11/2020 (Shift-1)

44. A and B can do a job in 10 days and 5 days, respectively. They worked together for two days, after which B was replaced by C and the work was finished in the next three days. How long will C alone take to finish 60% of the job?

SSC CPO 23/11/2020 (Shift-1)

45. A and B can do a piece of work in 36 days. B and C can do the same work in 60 days. A and C can do the same work in 45 days. In how many days can A alone complete the same work?

SSC CPO 23/11/2020 (Shift-2)

- (a) 90 (b) 45
(c) 60 (d) 120
46. X can do a work in 3 days, Y does three times the same work in 8 days, and Z does five times the same work in 12 days. If they have to work together for 6 hours in a day, then in how much time can they complete the work?

X.तिं वर्षं स्मर्यं संति 2तिं विं संपो
Y.ध्वर्यं स्मर्यं िं 2तिं संति 2तिं
वं संपोकिं 2तिं ध्वर्यं स्मर्यं मिस्सं 2तिं स
12तिं 2तिं विं संपोकिं 2तिं 10 विस्स
मैत् 2तिं 2तिं स्मर्यं िं 2तिं 4सस
स्मर्यं संमलं 2तिं 2तिं संपोकिं 2तिं

SSC CPO 23/11/2020 (Shift-2)

- (a) 4 hours
(b) 5 hours
(c) 5 hours 20 minutes
(d) 4 hours 10 minutes
47. A and B can do a piece of work in 36 days. B and C can do the same work in 60 days. A and C can do the same work in 45 days. In how many days can B alone complete the same work?

अकिसेभिन्ति वर्षे सन्ति ३६६ ति २५६
 वं प्रोभिक्सेभिन्ति वर्षे सन्ति ६० ति २५६
 ति वि प्रोअकिसेभिन्ति वर्षे स
 ४५ ति २५६ ति वि प्रोभिक् रभिष
 सन्ति २ ति २५६ ति मत्स वि संपो

SSC CPO 24/11/2020 (Shift-1)

- (a) 90 (b) 60
(c) 120 (d) 45
48. A and B can do a piece of work in 25 days. B alone can do $66\frac{2}{3}\%$ of the same work in 30 days. In how many days can A alone do $\frac{4}{15}$ part of the same work?

AकिसेBितं वर्ष सीं स25ति2सीं
 वं प्रीतिBिकं रभिवर्ष सीं 66 $\frac{2}{3}$ %
 प्ससीं स30ति2सीं विं सीपीA
 कं रभिवर्ष सीं 1 $\frac{4}{15}$ प्ससीं सतं 2।
 त2सीं विं सीपी

SSC CPO 24/11/2020 (Shift-1)

- (a) 15 (b) 20
(c) 18 (d) 12

49. P and Q together can do a work in 12 days. P alone can do the same work in 18 days. In how many days can Q alone complete two-third part of the same work?

०१ विस्मयः प्रकटितः तत् वर्षे स्वर्णि १२
तु २१ दिने मल्लि वि० प्रीतिं रपि भव
स्वर्णि १८ तु २१ दिने मल्लि वि० सीपी
कं रपि भव वर्षे स्वर्णि सात पक्षिः स
तं २१ तु २१ दिने मल्लि वि० सीपी

SSC CPO 24/11/2020 (Shift-2)

- (a) 30 (b) 21
(c) 24 (d) 36
50. A can complete some work in 35 days and B can complete the same work in 15 days. They worked together for 8 days, then B left the work. In how many days will A alone complete 60% of the remaining work?

A, ति वर्ष स्थिति 35 ति 2 ति वि स
पीकसी B भि वर्ष स्थिति 15 ति 2 ति मल्ल
व स पी पी 5 5 10 वि स 8 ति 2 ति
स्थिति ख भि हिस B 2 ति स्थिति अ प्र
त ख कि र A दि स स्थिति 60 % प्स
स ति 2 ति 2 ति मल्ल जस

SSC CPO 24/11/2020 (Shift-2)

- (a) 5 (b) 7
(c) 5 (d) 8
51. A and B can do a job in 10 days and 5 days, respectively. They worked together for two days, after which B was replaced by C and the work was finished in the next three days. How long will C alone take to finish 40% of the job?

SSC CPO 25/11/2020 (Shift-1)

- (a) 15 days (b) 18 days
(c) 10 days (d) 12 days
52. A is twice as good a workman as B, and together they finish a piece of work in 13 days. In how many days will A alone finish the work?

SSC CPO 25/11/2020 (Shift-1)

- (a) 41 (b) $19\frac{1}{2}$
(c) $9\frac{1}{4}$ (d) 39

53. P and Q together can do a work in 12 days. P alone can do the same work in 36 days. In how many days can Q alone complete two-third part of the same work?

पिकसिं Qविस्ससिं तिरं तिं वर्षं सीं स
 12तिं 2सीं मिसिं विं है प्रीतिं पिकं र।
 भवर्षं सीं 36तिं 2सीं विं है सीपी।
 Qकिं रतिं है 2तिं 2सीं भवर्षं सीं स
 सतै पस्यिपस्यि मिसिं विं है सीपी

SSC CPO 25/11/2020 (Shift-2)

- (a) 12 (b) 18
(c) 21 (d) 15
54. A can complete a certain work in 35 days and B can complete the same work in 15 days. They worked together for 7 days, then B left the work. In how many days will A alone complete 60% of the remaining work?

A तं वर्षं सूर्यं ३५ ति २३ ति मल्लं
 वं सूर्यं कसे B भिवर्षं सूर्यं १५ ति २३ ति
 मल्लं विं सूर्यं ५५ ति ७ ति २३ ति
 वसूर्यं सूर्यं तं खर्षं तमर्षं B २ ति सूर्यं अक्ष प्र
 तं खर्षं A किं र दिक्षं सूर्यं ६०% प्स
 ३ ति २ ति २३ ति मल्लं ज्ञ

SSC CPO 25/11/2020 (Shift-2)

55. 4 boys from school A and 6 boys from school B together can set up an exhibition in 5 days, which 5 boys from school A and 10 boys from school C together can do in 4 days or 3 boys from school B and 4 boys from school C together can do in 10 days. Then how many boys from school A can set up the exhibition in one day?

तै. ~~क~~ख A' रू रिरं प्र कि सी तै. ~~क~~ख B
 ढिरिरं प्र तिरै' 0' मुधद~~ख~~र्ष)ति 2सी
 र जीव' है प्रिखिष' सी तै. ~~क~~ख A' ि)
 रं प्र कि सी तै. ~~क~~ख C' ि ज्वरं रं प्र।
 तिरै' रू ति 2सी ि वि' है प्रिखिष तै. ~~क~~ख
 B' ि बरं रं प्र कि सी तै. ~~क~~ख C' रू
 रं प्र तिरै' ज्वरि 2सी वि' है प्रिखिष
 मुधद~~ख~~र्ष तै. ~~क~~ख A' ति' है 2रिरं प्र 0'
 त 2रि र जीव' है प्रि

SSC CPO 09/12/2019 (Shift-01)

- (a) 60 (b) 40
(c) 20 (d) 80

56. If 10 men can complete a piece of work in 12 days by working 7 hours a day, then in how many days can 14 men do the same work by working 6 hours a day?

खृत्तिर्न ख्रुगै मित्त२खिश्ना सी ।
 ० ि सी सज्जति २सीविश्वे वि ।
 प्रौषैक्षवर्ष सी सज्ज ख्रुगै मित्त२दिश्ना
 सी ति २ति २सीविश्वे वि ।
 प्रो

SSC CPO 09/12/2019 (Shift-01)

- (a) 15 (b) 16
(c) 10 (d) 12

57. A can do $\frac{2}{5}$ of a work in 6 days
and B can do $\frac{2}{3}$ of the same work

in 12 days. A and B worked together for 6 days. C alone completed the remaining work in 8 days. A and C working together will complete the same work in:

[illegible]

SSC CPO 09/12/2019 (Shift-02)

- (a) 12 Days (b) 9 Days
(c) 10 Days (d) 8 Days

58. A, B and C can do a piece of work in 30 days, 45 days and 90 days respectively. A started the work and he is assisted by B and C together on every third day. In how many days will complete the work?

A, B कक्षा C में सी सी डिसेबलित 20
A सी डिसेबल सी पी सी बी कक्षा C से स
तर पि प्व ति त भव ष वपस्यै सी ।
पी सी तं 2 ति 2 सी मल्ल पसी सज्ज

SSC CPO 09/12/2019 (Shift-02)

- (a) 23 (b) 24
(c) $22\frac{1}{2}$ (d) 30

A 0' f' सी' f' 10' नैत पस्सिप्ससी खिज्जति 2स
मिल्लि वि' सैपी हतं Bक्षिर्व सी' ।
 $\frac{3}{5}$ पस्सि सी' त्ति 2समिल्लि वि' सैपी
अप्सिज्जति 2स' f' 10' विससीतरे' f' सी'
तं खसिहसिपू0' सी' सैC2िकं रजि)ति 2स
मिल्लितं खसिध्वर् सी' f' $\frac{2}{3}$ पस्सि सी' C
कं र सितै 2ति 2समिल्लि जस

SSC CPO 13/12/2019 (Shift-01)

- (a) 27 (b) 24
(c) 30 (d) 32

69. If 45 persons can complete a work in 18 days, working 8 hours a day, then how many persons are required to complete two-thirds of the same work in 20 days, working 9 hours a day?
खि ()त्रिखै मैसत 2इअसि सी' f' 10'
सी' सैज्जति 2समिल्लि वि' प्रिषै सैध्व
सी' f' सैत पस्सिप्ससी सी' मैसत 2जिअस।
सी' f' , सित 2समिल्लि 2' ति 0
तै 2त्रिखै खि' ष' कसैदखं सैपसस

SSC CPO 13/12/2019 (Shift-02)

- (a) 24 (b) 40
(c) 36 (d) 30

70. A is twice as efficient as B and C is thrice as efficient as B. Working together, they can finish a certain work in 5 days. A and C worked together for 5 days. B alone would complete the remaining work in.

A, B व' सैसैकतं f' सैध्वदस पिीकसैC,
B व' छैज्जैकतं f' सैध्वदस पिी? f' 10'
विससीतरे' f' सी' सै पिू0' f' सी' सी'
त 2समिल्लि वि' प्रीAकिसैCि सैसै
विससीतरे' f' ति 2स' f' सी' सै प्रीदिस
सी' सैBकिं र तितै 2ति 2समिल्लि
र जस

SSC CPO 13/12/2019 (Shift-02)

- (a) 8 Days (b) 4 Days
(c) 6 Days (d) 5 Days

ANSWER KEY

1.(c)	2.(d)	3.(d)	4.(d)	5.(d)	6.(d)	7.(d)	8.(c)	9.(d)	10.(b)
11.(b)	12.(a)	13.(a)	14.(c)	15.(d)	16.(b)	17.(a)	18.(b)	19.(c)	20.(c)
21.(d)	22.(d)	23.(d)	24.(d)	25.(a)	26.(d)	27.(b)	28.(b)	29.(b)	30.(c)
31.(b)	32.(c)	33.(d)	34.(a)	35.(d)	36.(d)	37.(a)	38.(b)	39.(c)	40.(b)
41.(d)	42.(d)	43.(c)	44.(c)	45.(c)	46.(c)	47.(a)	48.(a)	49.(c)	50.(c)
51.(d)	52.(b)	53.(a)	54.(a)	55.(b)	56.(c)	57.(c)	58.(a)	59.(b)	60.(c)
61.(a)	62.(d)	63.(c)	64.(b)	65.(a)	66.(b)	67.(b)	68.(b)	69.(a)	70.(d)

SOLUTIONS

1. (c)

Time	Efficiency
P → 36 days	4
Q → 48 days	3
R → 144 days	1
P + Q + R → 8 unit	

Let, P and Q did not leave jobs.
then extra work:-
(12 × 4) + (3 × 8) = 72 unit
Total work = (144 + 72) = 216 unit
Required time to complete this work
by (P + Q + R) = $\frac{216}{8} = 27$ days.

2. (d)

Time	Efficiency
A → 20	3
B → 30	2
C → 60	1
Working According to question, Days Man Work	
1st → A	3
2nd → A	3
3rd → A + B + C	6
3 days _{×5}	12 _{×5}
15 days	60 unit

Hence, the work have been completed in 15 days.

3. (d) ATQ,

$$3G = 5S$$

$$G : S = 5 : 3$$

$$\text{Total work} = 54 \times 5 \times 3 \text{ unit}$$

Required days

$$= \frac{54 \times 5 \times 3}{6 \times 5 + 8 \times 3} = \frac{54 \times 5 \times 3}{54} = 15 \text{ days}$$

4. (d)

Time	Efficiency
A → 8 days	7
B → 7 days	8
56	

ATQ,

Days	Man	Work
1st →	A	7
2nd →	B	8
2 days _{×3}		15 _{×3}
6 days		45 unit
1 days →	A	7 unit
$\frac{1}{2}$ days →	B	4 unit
7 $\frac{1}{2}$ days		56 unit

Hence, the work have been completed in 7 $\frac{1}{2}$ days.

5. (d)

Time	Efficiency
P+Q → 30	4
Q+R → 24	5
R+P → 20	6
P + Q + R → $\frac{15}{2}$	

ATQ,

$$10(P + Q + R) + nP = 120$$

$$10 \times \frac{15}{2} + n\left(\frac{15}{2} - 5\right) = 120$$

$$75 + \frac{5}{2}n = 120$$

$$\frac{5}{2}n = 45$$

$$n = 18 \text{ days}$$

6. (d)

Time	Efficiency
J → 20	7
R → 28	5
140	

ATQ,

$$\text{Time required} = \frac{140}{12} = 11 \frac{2}{3} \text{ days}$$

7. (d) ATQ,

$$4M = 6B$$

$$\frac{M}{B} = \frac{3}{2}$$

Let, total work be 240 units
then 6M + 11B ⇒ (18 + 22)

$$\text{Required time} = \frac{240}{40} = 6 \text{ days}$$

8. (c)

Time	Efficiency
J → 42	9
R + J → 27	14
378	

ATQ,

$$\text{time} = \frac{14 \times 27}{5} = \frac{378}{5} = 75 \frac{3}{5}$$

9. (d)

	R	P
time	4	5
work	1	2
Eff.	5	8

Let, total work = (24 × 13) units

∴ Parul takes time

$$= \frac{24 \times 13}{8} = 39 \text{ days}$$

10. (b) A can do a work in 25 days

ATQ,

$$5(A + B) + 5B + 5A = 36000$$

$$\Rightarrow 10(A + B) = 36000$$

A can do work in 1 day worth of

$$= \text{Rs. } \frac{36000}{25}$$

$$\therefore \text{In 10 days} = \frac{36000}{25} \times 10$$

$$= 36 \times 4 \times 100 = \text{Rs. } 14400$$

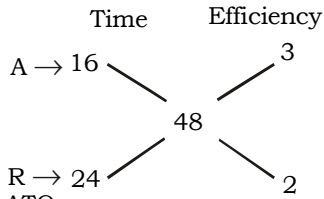
11. (b) No. of days A and B together take to complete given work

$$= \sqrt{25 \times 16}$$

$$= 20 \text{ days}$$

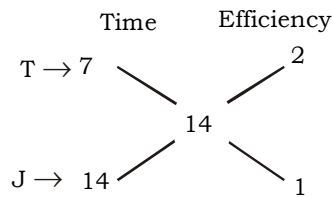
12. (a) Let, 15 employees left after n days.
 ATQ,
 $75 \times 60 = (75 \times n) + (60 \times (65 - n))$
 $4500 = 75n + 3900 - 60n$
 $600 = 15n$
 $n = 40$ days

13. (a)



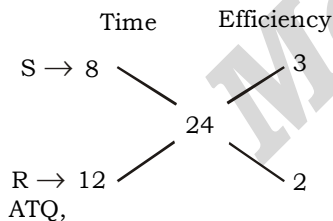
ATQ,
 2 days $\rightarrow$ 5 units
 18 days $\rightarrow$ 45 units
 Next day, work done by A = 3 unit
 $\therefore$ Total time = 19 days

14. (c)



ATQ,
 Time required = $\frac{14}{3} = 4 \frac{2}{3}$ days

15. (d)



Days	Man	Work
1st	$\rightarrow S$	$\rightarrow 3$
2nd	$\rightarrow R$	$\rightarrow 2$
2 days _{x4}		$\rightarrow 5_{x4}$
8 days		$\rightarrow 20$ unit
1 days $\rightarrow S$		$\rightarrow 3$ unit
$\frac{1}{2}$ days $\rightarrow R$		$\rightarrow 1$ unit
$9 \frac{1}{2}$ days		$\rightarrow 24$ unit

Hence, the work have been completed in $9 \frac{1}{2}$ days.

16. (b) $\frac{M_1 \times H_1 \times D_1}{W_1} = \frac{M_2 \times H_2 \times D_2}{W_2}$

$$\frac{36 \times 48}{25} = \frac{45 \times D_2}{60}$$

$$\Rightarrow D_2 = \frac{48 \times 48}{25} = 92.16 \text{ days}$$

17. (a) ATQ,

$$2m = 4w$$

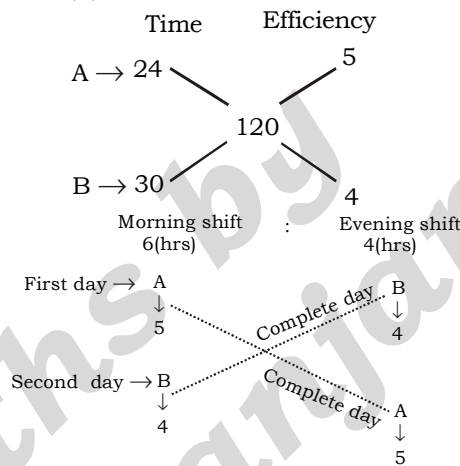
$$m : w = 2 : 1$$

$$\text{Total work} = 2 \times 2 \times 34 = 136$$

Time taken by 6 men & 5 women to build this wall

$$\Rightarrow \frac{136}{(6 \times 2 + 5 \times 1)} = \frac{136}{17} = 8 \text{ days}$$

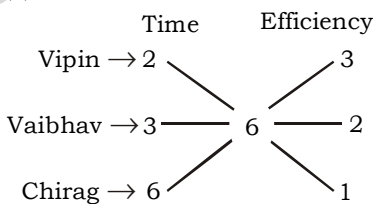
18. (b)



Time	Work
2 days $\rightarrow$	9 unit
2×13 days $\rightarrow$	9×13 unit
26 days $\rightarrow$	117 unit

Work complete at 27th day

19. (c) ATQ,



$$\text{Required time} \rightarrow \frac{6}{(3 + 2 + 1)} = \frac{6}{6}$$

$$= 1 \text{ day}$$

20. (c) ATQ,

$$\text{Ratio of time} \rightarrow R : T : J$$

$$6 : 3 : 2$$

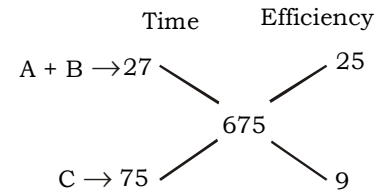
$$\text{Ratio of efficiency} \rightarrow 1 : 2 : 3$$

$$\text{Total work} \rightarrow (3 + 2 + 1)23$$

Tom can complete the work

$$= \frac{6 \times 23}{2} = 69 \text{ hours}$$

21. (d)



Given that

Time ratio

$$A = \frac{24}{10} (B + C)$$

$$A : B + C = 12 : 5$$

Efficiency ratio

$$A : B + C = (5 : 12)2$$

$$A + B : C = 25 : 9$$

$$A = 10, B = 15, C = 9$$

Time taken by B to complete the

$$\text{work} = \frac{27 \times 25}{15} = 45 \text{ days}$$

22. (d)

Arun can complete this work

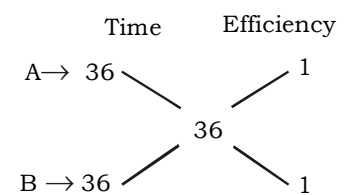
$$\Rightarrow \frac{2}{3} \text{ unit} = 12$$

$$1 \text{ unit} = 18 \text{ days}$$

Arun can complete $\frac{1}{6}$ of this work

in = 3 days

23. (d)



ATQ,

$$5 \text{ days} \rightarrow 10 \text{ units}$$

$$6 \text{ days} \rightarrow 11 \text{ units}$$

$$7 \text{ days} \rightarrow 13 \text{ units}$$

$$8 \text{ days} \rightarrow 14 \text{ units}$$

$$10 \text{ days} \rightarrow 18 \text{ units}$$

$$11 \text{ days} \rightarrow 19 \text{ units}$$

$$14 \text{ days} \rightarrow 25 \text{ units}$$

$$15 \text{ days} \rightarrow 26 \text{ units}$$

$$16 \text{ days} \rightarrow 27 \text{ units}$$

$$20 \text{ days} \rightarrow 35 \text{ units}$$

$$21 \text{ days} \rightarrow 36 \text{ units}$$

$\therefore$ Work will be completed on 21 July 2021

24. (d)

Time	220	Efficiency
A → 11 days	}	20
B → 20 days		11
C → 55 days		4

ATQ,
(A + B, A + C)
2 days → 55 units
8 days → 220 units
Hence, the work will be completed in 8 days.

25. (a)

A = $\frac{1}{5} \rightarrow 20$ days
 $\frac{1}{5} \rightarrow 20 \times 5 = 100$ days

B → 30% = $\frac{3}{10} \xrightarrow{\times 12} 36$ days
 $\frac{3}{10} \xrightarrow{\times 12} 120$ days

C → 80% = $\frac{4}{5} \xrightarrow{\times 20} 80$ days
 $\frac{4}{5} \xrightarrow{\times 20} 100$ days

Time	600	Efficiency
A → 100 days	}	6
B → 120 days		5
C → 200 days		3

ATQ,
 $x(B + C) + (x - 41)(A + C) = 600$
 $x(8) + (x - 41)9 = 600$
 $17x = 600 + 369$
 $x = \frac{969}{17} = 57$ days
 $\Rightarrow 2x = 114$
 Work done by C in 114 days = 3×114
 = 342 units

26. (d) **Case- I**

Time taken by x and (y + z) = 3 : 1
 Eff. = 1 : 3 = 5 : 15

Case- 2

Time taken by z and (y + x) = 4 : 1
 Eff. = 1 : 4 = 4 : 16

Total work = $20 \times 10 = 200$ units

Time taken by x and z to complete

the work = $\frac{200}{9} = 22\frac{2}{9}$ days

27. (b) Let the number of required percent = x

$$\text{We know, } \frac{M_1 D_1 H_1}{W_1} = \frac{M_2 D_2 H_2}{W_2}$$

$$\Rightarrow \frac{25 \times 140}{1} = \frac{x \times 70}{1}$$

$$\Rightarrow x = 50$$

28. (b) Let the total work be 1

Given,

A → 10 days

$$A + B \rightarrow 2\frac{1}{2} = \frac{5}{2} \text{ days}$$

$$B's \text{ Efficiency} = \frac{2}{5} - \frac{1}{10} = \frac{3}{10}$$

B will finish the work in

$$= \frac{1}{\frac{3}{10}} = \frac{10}{3} \text{ days}$$

29. (b) $12M \times 10 = 20B \times 10$

$$\Rightarrow \frac{M}{B} = \frac{5}{3}$$

Total Work = $12M \times 10$

$$= 12 \times 5 \times 10 = 600$$

Work done by 4 Men and 4 Boys

$$\text{in 4 days} = (4 \times 5 + 4 \times 3) \times 4$$

$$= 32 \times 4 = 128$$

Part of the work done by 4 men

$$\text{and 4 boys in 4 days} = \frac{128}{600} = \frac{16}{75}$$

30. (c) Let the total work = LCM(10, 15) = 30

A = 10 days	}	30
B = 15 days		

With the help of C the whole work done in 5 days.

Efficiency of (A + B + C)

$$= \frac{\text{Total Work}}{\text{Time Taken}} = \frac{30}{5} = 6$$

$$C's \text{ Efficiency} = 6 - (3 + 2) = 1$$

Hence, the C alone can finish the

$$\text{work in} = \frac{30}{1} = 30 \text{ days}$$

31. (b) Let the total work be 1.

A → 10 days

B → 15 days

Concept: The amount is distributed in the ratio of efficiency.

$$\therefore \frac{A's \text{ efficiency}}{B's \text{ efficiency}} = \frac{\left(\frac{1}{10}\right)}{\left(\frac{1}{15}\right)} = \frac{3}{2}$$

$$B's \text{ share} = \frac{2}{5} \times 1250 = \text{Rs. } 500$$

32. (c) Let the total work be 1.

A + M → 10 days

A → 15 days

∴ Maahi's efficiency

$$= \frac{1}{10} - \frac{1}{15} = \frac{1}{30}$$

Maahi can do the same work in

$$= \frac{1}{\frac{1}{30}} = 30 \text{ days}$$

33. (d)

Raju → 36	}	72
Angad → 18		
Sumit → 24		

∴ Work done by Altogether in

$$= \frac{72}{(2+4+3)} = \frac{72}{9} = 8 \text{ hours}$$

34. (a) Total work = $60 \times 40 = 2400$ units

Work done by 60 men in 10 days = 600

Work done by 55 men in 10 days = 550

Work done by 50 men in 10 days = 500

Work done by 45 men in 10 days = 450

Left work = $2400 - 2100 = 300$ units
 $\Rightarrow 300$ units work done by 40 men

$$\text{in} = \frac{340}{40} = 7.5 \text{ days}$$

$$\text{Total days} = 10 + 10 + 10 + 10 + 7.5 = 47.5 \text{ days}$$

35. (d) Let the total work be 1 unit.

The work can be finished by A and

$$B \text{ in} = \frac{1}{\left(\frac{1}{8} + \frac{1}{11}\right)} = \frac{88}{19} = 4\frac{12}{19} \text{ days}$$

36. (d)

A = 35	}	180
B = 45		

Work done by A and B in 2 days

$$= 2 \times 9 = 18$$

Remaining Work = $180 - 18 = 162$
 Remaining Work done by B alone
 $= \frac{162}{4} = 40.5$ days

37. (a) Given $P = 2R \Rightarrow \frac{P}{R} = \frac{2}{1}$

ATQ,

$$(P + Q) \times 14 = (Q + R) \times 21$$

$$\Rightarrow \frac{2+Q}{Q+1} = \frac{21}{14}$$

$$\Rightarrow 2(2 + Q) = 3(Q + 1)$$

$$\Rightarrow 4 + 2Q = 3Q + 3$$

$$\Rightarrow Q = 1$$

Thus, $P = 2$, $Q = 1$ and $R = 1$

$$\text{Total work} = (P + Q) \times 14$$

$$= (2 + 1) \times 14 = 42 \text{ units}$$

Hence, Q alone can do the work

$$\text{in} = \frac{42}{1} = 42 \text{ days.}$$

38. (b) Let the number of committed men to do the work be x .

ATQ,

$$\Rightarrow x \times 20 = (x - 5) \times 40$$

$$\Rightarrow 20x = 40x - 200$$

$$\Rightarrow -20x = -200$$

$$\Rightarrow x = 10$$

39. (c) Let the total number of men required to finish the work in 10 days be x .

Now,

$$24 \times 15 = x \times 10$$

$$\Rightarrow x = \frac{360}{10} = 36$$

40. (b) ATQ,

$$(8M + 12W) \times 4 = (6M + 14W) \times 5$$

$$\Rightarrow 32M + 48W = 30M + 70W$$

$$\Rightarrow 32M - 30M = 70W - 48W$$

$$\Rightarrow 2M = 22W$$

$$\Rightarrow M = 11W$$

$$\Rightarrow \frac{M}{W} = \frac{11}{1}$$

$$\text{Total Work} = (8M + 12W) \times 4$$

$$= (88 + 12) \times 4 = 400 \text{ units}$$

$$\text{Work done 20 women only} = \frac{400}{20 \times 1}$$

$$= 20 \text{ days}$$

41. (d) Ankita = 20 days

$$\text{Ankita} + \text{Somya} = 12 \text{ days}$$

$$\text{Efficiency of Somya} = \frac{1}{12} - \frac{1}{20}$$

$$= \frac{5-3}{60} = \frac{1}{30}$$

Somya can write manuscript in

$$= \frac{1}{\frac{1}{30}} = 30 \text{ days.}$$

42. (d) $\begin{array}{l} \text{Reena} \rightarrow 4 \\ \text{Veena} \rightarrow 8 \\ \text{Vimla} \rightarrow 12 \end{array} \begin{array}{l} \nearrow 6 \\ \rightarrow 3 \\ \searrow 2 \end{array} 24$

Work done by altogether in

$$= \frac{24}{11} = 2\frac{2}{11} \text{ hours}$$

43. (c)

$$\begin{array}{l} \text{A} : \text{B} \\ \text{Efficiency} \quad 2 : 1 \\ \text{Total work} = (2 \times 1) \times 13 = 39 \end{array}$$

$$\text{B completed work in} = \frac{39}{1}$$

$$= 39 \text{ Days}$$

44. (c) $\begin{array}{l} \text{A} \text{ --- } 10 \\ \text{B} \text{ --- } 5 \end{array} \begin{array}{l} \nearrow 1 \\ \rightarrow 10 \\ \searrow 2 \end{array}$

$$2 \text{ Days work of (A + B)} = (1 + 2) \times 2 = 6$$

$$N \text{ xet 3 days A'S work} = 1 \times 3 = 3$$

$$\text{Remaing work} = [10 - (6 + 3)] = 1$$

$$1 \text{ work, C complete in 3 days}$$

$$10 \text{ work, C complete in} = 10 \times 3$$

$$= 30 \text{ days}$$

$$60\% \text{ of total work, C completed}$$

$$\text{in} = 30 \times \frac{60}{100} = 18 \text{ days}$$

45. (c) $\begin{array}{l} \text{A+B} \text{ --- } 36 \\ \text{B+C} \text{ --- } 60 \\ \text{C+A} \text{ --- } 45 \end{array} \begin{array}{l} \nearrow 5 \\ \rightarrow 180 \\ \searrow 3 \\ \quad 4 \end{array}$

$$\therefore 2(A + B + C) = 5 + 3 + 4 = 12$$

$$A + B + C = 6$$

$$\therefore \text{Efficiency of A} = 3$$

$$\text{A alone completed the work in}$$

$$= \frac{180}{3} = 60 \text{ days}$$

46. (c)

$$\begin{array}{l} x : y : z \\ \text{Time} \quad 3 : \frac{8}{3} : \frac{12}{5} \\ 45 : 40 : 36 \\ \text{Efficiency} \quad \frac{1}{45} : \frac{1}{40} : \frac{1}{36} \\ 8 : 9 : 10 \end{array}$$

$$\therefore 8 + 9 + 10 = 27$$

$$1 \text{ hour work} = \frac{24}{27}$$

$$\therefore \text{In 6 hours} = \frac{24}{27} \times 6 = \frac{16}{3}$$

$$= 5 \text{ hours } 20 \text{ min.}$$

47. (a) $\begin{array}{l} \text{A+B} \text{ --- } 36 \\ \text{B+C} \text{ --- } 60 \\ \text{C+A} \text{ --- } 45 \end{array} \begin{array}{l} \nearrow 5 \\ \rightarrow 180 \\ \searrow 3 \\ \quad 4 \end{array}$

$$\therefore 2A + 2B + 2C = 12$$

$$\therefore A + B + C = 6$$

$$\text{B's Efficiency} = 2$$

B alone can complete the work

$$\text{in} = \frac{180}{2} = 90 \text{ days}$$

48. (a) $A + B \rightarrow 25 \text{ Days}$

$$B \rightarrow 30 \times \frac{3}{2} = 45 \text{ days}$$

$\begin{array}{l} \text{A+B} \text{ --- } 25 \\ \text{B} \text{ --- } 45 \end{array} \begin{array}{l} \nearrow 9 \\ \rightarrow 225 \\ \searrow 5 \end{array}$

$$\frac{4}{15} \text{ work done by A alone in}$$

$$= \frac{225 \times \frac{4}{15}}{9-5} = \frac{225 \times 4}{15 \times 4} = 15 \text{ Days}$$

49. (c) $\begin{array}{l} \text{P+Q} \text{ --- } 12 \\ \text{P} \text{ --- } 18 \end{array} \begin{array}{l} \nearrow 3 \\ \rightarrow 36 \\ \searrow 2 \end{array}$

Q alone can finish the two-third

$$\text{of the work in} = \frac{36 \times \frac{2}{3}}{3-2} = 24 \text{ Days}$$

50. (c) $\begin{array}{l} \text{A} \text{ --- } 35 \\ \text{B} \text{ --- } 15 \end{array} \begin{array}{l} \nearrow 3 \\ \rightarrow 105 \\ \searrow 7 \end{array}$

$$(A + B)'s 8 \text{ Days work} = (3 + 7) \times 8 = 80$$

$$\text{Remaining work} = 105 - 80 = 25$$

$$60\% \text{ of Remaing work} = 25 \times \frac{60}{100} = 15$$

Remaining work done by A in

$$= \frac{15}{3} = 5 \text{ Days}$$

51. (d) $\begin{array}{l} \text{A} \text{ --- } 10 \\ \text{B} \text{ --- } 5 \end{array} \begin{array}{l} \nearrow 1 \\ \rightarrow 10 \\ \searrow 2 \end{array}$

$$\text{Work done by A \& B together in first 2 days} = (1 + 2) \times 2 = 6 \text{ unit}$$

$$\text{Work done by A in next 3 days}$$

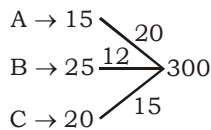
$$= 3 \times 1 = 3 \text{ unit}$$

$$\text{Remaining work} = [10 - (6 + 3)] = 1$$

$$\text{Remaining work 1 unit is completed by C in 3 days.}$$

- Now,
 40% of total work = $10 \times \frac{40}{100} = 4$
 C will complete this 4 unit work in $3 \times 4 = 12$ days
52. (b)
 $A : B$
 Efficiency $2 : 1$
 Total work done by (A + B) in 13 days = $(2 + 1) \times 13 = 39$
 39 unit work completed by A in
 $= \frac{39}{2} = 19\frac{1}{2}$ days
53. (a)
 $P + Q \text{ --- } 12 \text{ Days}$
 $P \text{ --- } 36 \text{ Days}$
 Q can completed the whole work
 $= \frac{36}{3-1} = 18 \text{ Days}$
 Two-third of work, completed by
 Q in = $18 \times \frac{2}{3} = 12 \text{ Days}$
54. (a) $A \text{ --- } 35$
 $B \text{ --- } 15$
 $(A + B)$'s 7 days work = $(3 + 7) \times 7 = 70$
 Remaining work = $105 - 70 = 35$
 60% of remaining work
 $= 35 \times \frac{60}{100} = 21$
 Remaining work completed by A
 in = $\frac{21}{3} = 7 \text{ Days}$
55. (b) ATQ,
 $(4A + 6B) \times 5 = (5A + 10C) \times 4$
 $= (3B + 4C) \times 10$
 Now, $(4A + 6B) \times 5 = (3B + 4C) \times 10$
 $\Rightarrow (4A + 6B) = (6B + 8C)$
 $\Rightarrow 4A = 8C$
 $\Rightarrow A : C = 2 : 1$
 Again,
 $(5A + 10C) \times 4 = (3B + 4C) \times 10$
 $\Rightarrow 20A + 40C = 30B + 40C$
 $\Rightarrow 20A = 30B$
 $\Rightarrow A : B = 3 : 2$
 $A : B : C = 6 : 4 : 3$
 Total work = $(4A + 6B) \times 5$
 $= (24 + 24) \times 5 = 240$
 Number of boy's from school A can set up the exhibition in one day
 $= \frac{240}{6} = 40$
56. (c) ATQ,
 $\frac{10 \times 12 \times 7}{1} = \frac{14 \times D \times 6}{1}$
 $\Rightarrow D = 10$
57. (c)
 $A \rightarrow 6 \times \frac{5}{2} = 15 \text{ days}$
 $B \rightarrow 12 \times \frac{3}{2} = 18 \text{ days}$
 $A \rightarrow 15$
 $B \rightarrow 18$
 90 (Total Work)
 Work done by A and B in 6 days = $(6 + 5) \times 6 = 66$
 Remaining work = $90 - 66 = 24$
 ATQ, 'C' complete the remaining work in 8 days.
 Efficiency of 'C' = $\frac{24}{8} = 3$
 A & C will complete the same work
 in = $\frac{90}{(6+3)} = 10 \text{ days}$
58. (a)
 $A \rightarrow 30$
 $B \rightarrow 45$
 $C \rightarrow 90$
 90
 Work done by A, B and C in 3 days = $3A + B + C$
 $= 3 \times 3 + 2 + 1 = 12$
 Work done (A, B and C) in 21 days = $12 \times 7 = 84$
 Remaining work = $(90 - 84) = 6$
 A will complete 6 unit work in = $\frac{6}{3} = 2 \text{ days}$
 Total no. of required days = $21 + 2 = 23 \text{ days}$
59. (b)
 $A \rightarrow 20 \times \frac{5}{4} = 25 \text{ days}$
 $B \rightarrow 15 \times \frac{4}{3} = 20 \text{ days}$
 $A \rightarrow 25$
 $B \rightarrow 20$
 100
 Work done by A and B in 10 days = $(4 + 5) \times 10 = 90$
 Remaining work = $(100 - 90) = 10$
 'C' complete the remaining work in 1 days
 efficiency of 'C' = $\frac{10}{1} = 10$
- B and C together can complete $\frac{3}{4}$ of the same work in
 $= \frac{100 \times \frac{3}{4}}{(5+10)} = \frac{75}{15} = 5 \text{ days}$
60. (c) A and B alone can do work in $(x + 8)$ and $(x + 18)$
 A and B together can do the work in = $\sqrt{8 \times 18} = 12$
 So, $x = 12$ days
 A and B together completed the $\frac{5}{6}$ of the work in = $12 \times \frac{5}{6} = 10 \text{ days}$
61. (a)
 $A \rightarrow 12 \times \frac{5}{2} = 30 \text{ days}$
 $B \rightarrow 16 \times \frac{3}{2} = 24 \text{ days}$
 $A \rightarrow 30$
 $B \rightarrow 24$
 120
 Work done by A & B in 10 days = $(4 + 5) \times 10 = 90$
 Remaining work = $(120 - 90) = 30$
 'B' alone will complete the remaining work in = $\frac{30}{5} = 6 \text{ days}$
62. (d) ATQ,
 $\frac{18 \times 32 \times 7}{1} = \frac{14 \times D \times 8}{1}$
 $\Rightarrow D = 36$
63. (c)
 $A : B : C$
 $4 : 2 : 3$
 ATQ, $(7 + D) \times 4 = D \times 16$
 $\Rightarrow 28 + 4D = 16D$
 $\Rightarrow 28 = 12D$
 $\Rightarrow D = \frac{28}{12} = \frac{7}{3}$
 Total work = $16 \times \frac{7}{3}$
 'A' alone will finish 75% of the same task in = $\frac{16 \times \frac{7}{3} \times \frac{3}{4}}{4} = 7 \text{ days}$

64. (b)



Work done by A, B and C in 6 days
 $= (20 + 12 + 15) \times 6$

$$= 47 \times 6 = 282$$

Remaining work $= (300 - 282) = 18$

'B' finished remaining work in =

$$\frac{18}{12} = 1\frac{1}{2} \text{ days.}$$

65. (a)

Vivek	Vishal
4	7

Vivek can do a work in 14 days

Total work $= (14 \times 4) = 56$

Vivek can complete the work alone

$$\text{in } = \frac{56}{7} = 8 \text{ days.}$$

66. (b) Let the total work = 60

Efficiency of Vaibhav = 1

Vaibhav's 15 day's work = 15

Remaining work $= 60 - 15 = 45$

Sandeep Finishes the work in 30 days.

$$\text{Efficiency of Sandeep} = \frac{45}{30} = 1.5$$

$$\text{Both can do the work in } = \frac{60}{2.5}$$

$$= 24 \text{ days}$$

67. (b) ATQ,

$$(3M + 5W) \times 6 = (4M + 9W) \times 4$$

$$\Rightarrow 18M + 30W = 16M + 36W$$

$$\Rightarrow 2M = 6W$$

$$\Rightarrow \frac{M}{W} = \frac{3}{1}$$

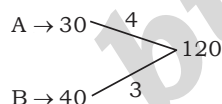
$$\text{Total Work} = (3M + 5W) \times 6 = (3 \times 3 + 5 \times 1) \times 6 = 84$$

Number of women are required to do the same work in 7 days

$$\Rightarrow W \times 1 \times 7 = 84$$

$$\Rightarrow W = 12$$

68. (b)



Work done by A and B in 10 days

$$= (4 + 3) \times 10 = 70$$

Remaining work $= (120 - 70) = 50$
 'C' alone completed the remaining work in = 15 days

★★★★★

$$\text{efficiency of 'C'} = \frac{50}{15} = \frac{10}{3}$$

'C' alone do $\frac{2}{3}$ of the same work

$$\text{in } = \frac{120 \times \frac{2}{3}}{\frac{10}{3}} = \frac{80 \times 3}{10} = 24 \text{ days}$$

$$69. (a) \frac{M_1 \times D_1 \times T_1}{W_1} = \frac{M_2 \times D_2 \times T_2}{W_2}$$

$$\Rightarrow \frac{45 \times 18 \times 8}{1} = \frac{M_2 \times 20 \times 9}{\frac{2}{3}}$$

$$\Rightarrow M_2 = 24$$

70. (d)

A	B	C
2	1	3

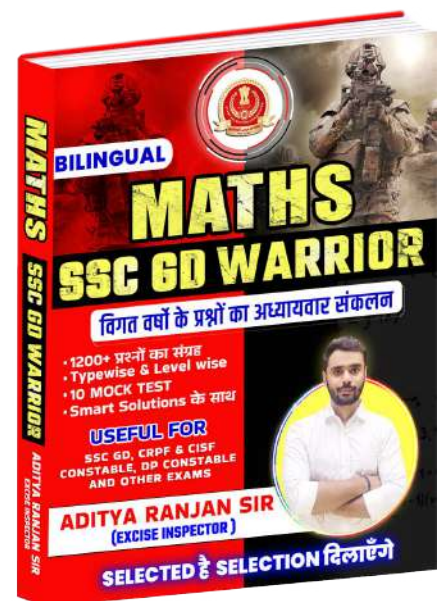
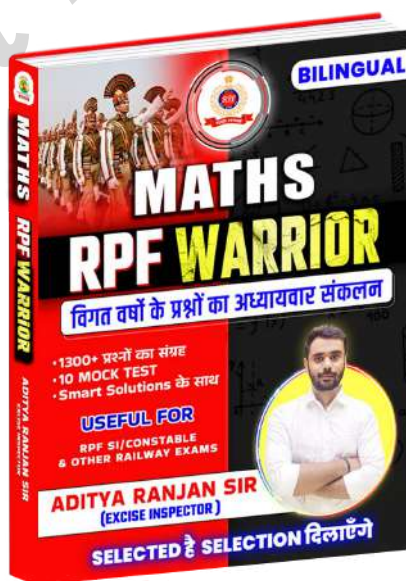
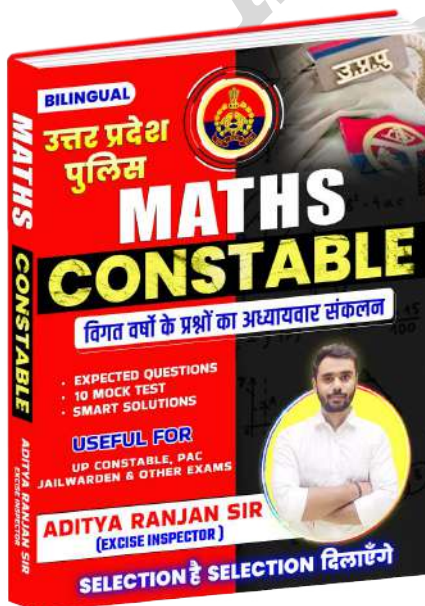
$$T.W = (6 \times 5) = 30$$

Work done by A and C in 5 days
 $= 5 \times 5 = 25$

Remaining work $= 30 - 25 = 5$

'B' alone complete the remaining

$$\text{work in } = \frac{5}{1} = 5 \text{ days}$$





PIPE & CISTERN

10

प्रतिस्पर्धा

1. An inlet pipe can fill an empty tank in 3.6 hours, while an outlet pipe can drain a completely-filled tank in 6.3 hours. If both the pipes are opened simultaneously when the tank is empty, in how many hours will the tank get completely filled?

किसी इन्लेट पाइप को सिकसना के लिए एक टैंक को 3.6 घंटे में भर सकता है, जबकि आउटलेट पाइप एक पूरी तरह से भरा टैंक को 6.3 घंटों में खाली कर सकता है। यदि दोनों पाइप एक साथ खोले जायें, तो टैंक को पूरी तरह से भरने में कितने घंटे लगेंगे?

SSC CPO 04/10/2023 (Shift-01)

- (a) 8.7 (b) 8.1
(c) 9.0 (d) 8.4

2. Two pipes can fill a cistern in 12 hours and 16 hours, respectively. The pipes are opened simultaneously and it is found that due to leakage at the bottom, it takes 90 minutes more to fill the cistern. How much time will the leakage take to empty the completely filled tank?

दो पाइप एक सिस्टरन को 12 घंटे और 16 घंटों में भर सकते हैं। पाइप एक साथ खोले जाते हैं और पाया जाता है कि निचले हिस्से में रिसाव के कारण टैंक को भरने में 90 मिनट अधिक लगते हैं। रिसाव को खाली करने में कितना समय लगेगा?

SSC CPO 04/10/2023 (Shift-3)

- (a) $39\frac{13}{49}$ h (b) $36\frac{29}{49}$ h
(c) $37\frac{15}{49}$ (d) $38\frac{10}{49}$ h

3. There are 3 taps A, B and C in a tank. These can fill the tank in 10 h, 20 h and 25 h, respectively. At first, all three taps are opened simultaneously. After 2 h, tap C is closed and tap A and B keep running. After 4 h, tap B is also closed. The remaining tank is filled by tap A alone. Find the percentage of done by tap A itself.

एक टैंक में तीन टैप्स A, B और C हैं। ये टैप्स टैंक को 10, 20 और 25 घंटों में भर सकते हैं। प्रारंभ में, सभी टैप्स एक साथ खोले जाते हैं। 2 घंटे बाद, टैप C बंद हो जाता है और टैप्स A और B चले जाते हैं। 4 घंटे बाद, टैप B भी बंद हो जाता है। शेष टैंक टैप A द्वारा भर लिया जाता है। टैप A द्वारा पूरा किया गया टैंक का प्रतिशत क्या है?

SSC CPO 10/11/2022 (Shift-02)

- (a) 75% (b) 52%
(c) 72% (d) 32%

4. Two pipes A and B can fill a tank in 15 hours and 18 hours, respectively. Both pipes are opened simultaneously to fill the tank. In how many hours will the empty tank be filled?

दो पाइप A और B एक टैंक को 15 घंटे और 18 घंटों में भर सकते हैं। दोनों पाइप एक साथ खोले जाते हैं। टैंक को भरने में कितने घंटे लगेंगे?

SSC CPO 23/11/2020 (Shift-1)

- (a) $7\frac{2}{11}$ (b) $9\frac{2}{11}$
(c) $10\frac{2}{11}$ (d) $8\frac{2}{11}$

5. Pipes A and B can fill a tank in 16 hours and 24 hours, respectively, whereas pipe C can empty the full tank in 40 hours. All three pipes are opened together, but pipe A is closed after 10 hours. After how many hours will the remaining part of the tank be filled?

पाइप A और B एक टैंक को 16 घंटे और 24 घंटों में भर सकते हैं, जबकि पाइप C एक पूर्ण टैंक को 40 घंटों में खाली कर सकता है। सभी तीन पाइप एक साथ खोले जाते हैं, लेकिन पाइप A 10 घंटे बाद बंद हो जाता है। शेष टैंक को भरने में कितने घंटे लगेंगे?

SSC CPO 23/11/2020 (Shift-1)

- (a) $15\frac{1}{2}$ (b) $12\frac{1}{2}$
(c) 20 (d) 10

6. Two pipes can fill a tank in 15 hours and 4 hours, respectively, while a third pipe can empty it in 12 hours. How long (in hours) will it take to fill the empty tank if all the three pipes are opened simultaneously?

दो पाइप एक टैंक को 15 घंटे और 4 घंटों में भर सकते हैं, जबकि तीसरा पाइप इसे 12 घंटों में खाली कर सकता है। यदि तीनों पाइप एक साथ खोले जायें, तो टैंक को भरने में कितने घंटे लगेंगे?

SSC CPO 23/11/2020 (Shift-2)

- (a) $\frac{20}{7}$ (b) $\frac{15}{7}$
(c) $\frac{50}{7}$ (d) $\frac{30}{7}$

7. When operated separately, pipe A takes 5 hours less than pipe B to fill a cistern, and when both pipes are operated together, the cistern gets filled in 6 hours. In how much time (in hours) will pipe B fill the cistern, if operated separately?

जब अलग-अलग चलाए जायें, पाइप A पाइप B से 5 घंटे कम में एक सिस्टरन को भर सकता है, और जब दोनों पाइप एक साथ चले जायें, तो सिस्टरन 6 घंटों में भर जाता है। यदि पाइप B अलग-अलग चलाया जायें, तो इसे भरने में कितने घंटे लगेंगे?

SSC CPO 23/11/2020 (Shift-2)

- (a) 18 (b) 15
(c) 9 (d) 10

8. Pipes A, B and C can fill an empty tank in $\frac{30}{7}$ hours, if all the three pipes are opened simultaneously.

A and B are filling pipes and C is an emptying pipe. Pipe A can fill the tank in 15 hours and pipe C can empty it in 12 hours. In how long (in hours) can pipe B alone fill the empty tank?

रि सर जेर सA, B स2 जस C सक सकिर्स जज

नजस सर षसमसुर्क ंसनजस सहकं सकस $\frac{30}{7}$

जसतसवजर्स किरिदससA स2 जसB सवज स-ज ।
र जेर सदस2 जसC सनजस सक ष ज जेर सदस
र जेर सA सहक सकस 15 स जसतसवजर्स किरिदस
2 जस र जेर सC सी स 12 स जसतसवजर्स सक
किरिदस र जेर सB स2 क ष सून सनजस सहकं
कसकिर्स स तमसतस जसतसवजर्स किरिदस

SSC CPO 24/11/2020 (Shift-1)

- (a) 4 (b) 6
(c) 3 (d) 5

9. When operated separately, pipe A takes 5 hours less than pipe B to fill a cistern, and when operated together, the cistern gets filled in 6 hours. In how much time (in hours) will pipe A fill the cistern, if operated separately?

2 १ 072 १ 0 सी तमस षस) ज झ क सिबज सस
क सहकं सक जसज सतस र जेर सA, स र जेर सB
क स ष जस 5 स जसतस तमस र जिरिदस2 ज
किर्स जज) ज झ क सिबज सस सहकं स2 जसतस
वजसवजर्स सदस लस र जेर सA क स2 क ष स) ज इ
कमजस जी स षस दसहक सकसकिर्स स तमसतस
8 जसतसवजर्स स) ज

SSC CPO 24/11/2020 (Shift-1)

- (a) 10 (b) 18
(c) 9 (d) 15

10. A pump can fill a tank with water in 3 hours. Because of a leak, it

took $3\frac{1}{3}$ hours to fill the tank. In

how many hours can the leak alone drain all the water of the tank when it is full?

क जेर स ये सुर्क ंसर ज स-ज सहकं सकस 3 स ज
तसवजर्स किरिदस स2 जसतसवजर्स सहकं

कसवज सतस $3\frac{1}{3}$ जसतस 0 रिदस वदसहकं

वजस सदस स2 क ष स) ज सकसहकं सकस स
र ज सकस क स सतस किरि स जसतस 0 घस

SSC CPO 24/11/2020 (Shift-2)

- (a) 21 (b) 15
(c) 30 (d) 10

11. Pipes A, B and C can fill a tank in 15, 30 and 40 hours, respectively. Pipes A, B and C are opened at 6 a.m., 8 a.m. and 10 a.m., respectively, on the same day. When will the tank be full?

र जेर सA, B स2 जसC सुर्क सहकं सकस तस
15, 30 स2 जस 40 स जसतसवजर्स किरिदस क
द सल स र जेर सA, B स2 जसC सकस तसस6,
8 स2 जस 10 स सवज जस र जिरिदसहकं सकस
द व सवजसव जी 0 %

SSC CPO 24/11/2020 (Shift-2)

- (a) 3:20 p.m. (b) 11:20 p.m.
(c) 7:20 p.m. (d) 5:20 p.m.

12. Two pipes A and B can fill a tank in 12 hours and 18 hours, respectively. Both pipes are opened simultaneously. In how much time will the empty tank be filled completely?

लस र जेर सA स2 जसB सकसहकं सकस तस
12 स2 जस 18 स जसतसवजर्स किरिदसहकं सकस
वज सकस स सिलस र जेर स सकसकिर्स जज
नजस जस र जिरिदस सनजस सहकं सकस सलसतस
र इ सवजसव जी 0 %

SSC CPO 25/11/2020 (Shift-1)

- (a) 8 hours
(b) 10 hours 24 minutes
(c) 9 hours 30 minutes
(d) 7 hours 12 minutes

13. Pipes A and B can fill a tank in 16 hours and 24 hours, respectively, whereas pipe C can empty the full tank in 40 hours. All three pipes are opened together, but pipe C is closed after 10 hours. After how many hours will the remaining part of the tank be filled?

र जेर सA स2 जसB सकसहकं सकस तस 16
2 स2 24 स जसतसवजर्स किरिदस वद कस र जेर
C सून सवजस सदसहकं सकस 40 स जसतसवजर्स
क षस किरिदस र जेर स सकसकिर्स जज
नजस जस र जिरिदस स) क स 10 स जसतसवजर्स र जेर
C सकसहक सकस सलस र जिरिदसहकं सकस सवजस
वजस सकस स जसतसवजर्स स) ज

SSC CPO 25/11/2020 (Shift-1)

- (a) 2
(b) $2\frac{1}{2}$
(c) 5
(d) $5\frac{1}{2}$

14. Two pipes A and B can fill a cistern in $12\frac{1}{2}$ hours and 25 hours, respectively. The pipes are opened simultaneously and it is found that due to a leakage in the bottom, it took 1 hour 40 minute more to full the cistern. When the cistern is full in how much time will the leak empty the cistern?

$12\frac{1}{2}$ स जस 25 स जसतसवजर्स किरिदस

लस र जेर सकिर्स जस नजस स 0 रि स2 जसमद
र ज 40 मजस कस स) स) स सकसक ज? सहकं
कसवज सतस 1 स जस 40 सत हस2 क कस 0 ज
वदसहकं सवजस सदस स) स) ज स ष जसहकं
नजस सदस सतस किरि स तमस 00 ज

SSC CPO 25/11/2020 (Shift-2)

- (a) 48 hours (b) 45 hours
(c) 42 hours (d) 50 hours

15. A pump can fill a tank with water in 1 hour. Because of a leak, it took $1\frac{1}{3}$ hours to fill the tank.

In how many hours can the leak alone drain all the water of the tank when it is full?

क जेर स ये सुर्क ंसर ज सक सहकं सकस 1 स ज
तसवजर्स किरिदस स2 जसतसवजर्स सहकं

कसवज सतस $1\frac{1}{3}$ जसतस 0 रिदस वदसहकं

वदसहकं स इ सवजस सदस स) स) स) ज स
किरि स जसतसहक सकस स) स) सहदस व जी 0 ज

SSC CPO 25/11/2020 (Shift-2)

- (a) 2 (b) 1
(c) 4 (d) 5

16. Pipes A and B can fill an empty tank in 6 and 8 hours respectively. While pipe C can empty the full tank in 10 hours. If all three pipes are opened together, then the tank will get filled in.

र जेर सA स2 जसB सकसजस सहक सकस तस
पस2 जस स जसतसवजर्स किरिदस वद कस र जेर
C सवजसहक सकस 10 स जसतसवजर्स सकस किरि
दस स) लस र जेर स सकसकिर्स जस नजस सलसज
व र जिरिदस सहक सकस स) स तमसतसवजर्स व जी 0 ज

SSC CPO 09/12/2019 (Shift-01)

- (a) $4\frac{4}{23}$ hrs (b) $6\frac{1}{5}$ hrs
(c) $5\frac{5}{23}$ hrs (d) $7\frac{1}{2}$ hrs

17. Three pipes, A, B, C can fill an empty cistern in 2, 3 and 6 hours respectively. They are opened together. After what time should B be closed, so that the cistern gets filled in exactly 1 hr 15 min?

तीन पाइप A, B, C एक खाली सिस्टर्न को 2, 3 और 6 घंटों में भर सकते हैं। वे एक साथ खोले जाते हैं। कितने समय के बाद पाइप B को बंद कर दिया जाए कि सिस्टर्न ठीक 1 घंटा 15 मिनट में भर जाए?

SSC CPO 09/12/2019 (Shift-01)

- (a) 20 min (b) 45 min
(c) 30 min (d) 15 min

18. Pipes A, B and C together can fill a cistern in 12 hours. All the three pipes are opened together for 4 hours and then C is closed. A and B together take 10 hours to fill the remaining part of the cistern C alone will fill two-thirds of the cistern in:

पाइप A, B और C एक सिस्टर्न को 12 घंटों में भर सकते हैं। तीनों पाइपों को 4 घंटे के लिए खोला जाता है और फिर पाइप C बंद कर दिया जाता है। A और B एक साथ शेष भाग को 10 घंटों में भर सकते हैं। सिस्टर्न को भरने के लिए पाइप C को अकेले कितने घंटों में भरना पड़ेगा?

SSC CPO 09/12/2019 (Shift-02)

- (a) 40 Hours (b) 48 Hours
(c) 60 Hours (d) 50 Hours

19. Pipes A, B and C can fill a tank in 10, 15 and 30 hours, respectively. D is an emptying pipe which alone can empty the full tank in x hours. A, B and C are opened together for 3 hours and then closed. Now D is opened which alone empties the tank in 30 hours. What is the value of x?

पाइप A, B और C एक टैंक को 10, 15 और 30 घंटों में भर सकते हैं। D एक खाली करने वाला पाइप है जो अकेले पूरा टैंक को x घंटों में खाली कर सकता है। A, B और C एक साथ 3 घंटे के लिए खोले जाते हैं और फिर बंद कर दिए जाते हैं। अब D खोला जाता है और अकेले टैंक को 30 घंटों में खाली कर देता है। x का मान क्या है?

SSC CPO 09/12/2019 (Shift-02)

- (a) 40 (b) 50
(c) 60 (d) 45

20. Three pipes, A, B and C, can fill a cistern in 12, 18 and 24 minutes, respectively. if all the pipes are opened together for 7 minutes, what will be the volume of the water that overflows as the percentage of the total volume of the cistern?

तीन पाइप A, B और C एक सिस्टर्न को 12, 18 और 24 मिनटों में भर सकते हैं। यदि तीनों पाइपों को एक साथ 7 मिनट के लिए खोला जाता है, तो सिस्टर्न से कितना पानी बाहर निकलेगा, जो सिस्टर्न के कुल आयतन का प्रतिशत होगा?

SSC CPO 11/12/2019 (Shift-01)

- (a) $26\frac{7}{18}$ (b) $23\frac{1}{3}$
(c) $23\frac{2}{3}$ (d) $26\frac{5}{18}$

21. Pipes P and Q can fill a tank in 18 and 27 minutes, respectively, whereas pipe R can empty the full tank in 54 minutes, P and Q were opened together for 6 minutes and then closed and R was opened. The tank was emptied by R alone in:

पाइप P और Q एक टैंक को 18 और 27 मिनटों में भर सकते हैं, जबकि पाइप R एक टैंक को 54 मिनटों में खाली कर सकता है। P और Q एक साथ 6 मिनट के लिए खोले जाते हैं और फिर बंद कर दिए जाते हैं। अब R खोला जाता है और टैंक को खाली करने में कितने मिनट लगेंगे?

SSC CPO 11/12/2019 (Shift-01)

- (a) 30 minutes (b) 40 minutes
(c) 35 minutes (d) 45 minutes

22. Pipes A and B together can fill an empty tank in $6\frac{2}{3}$ minutes. If A

takes 3 minutes more than B to fill the tank, then the time (in minutes) in which A alone would fill one-third part of the tank is:

पाइप A और B एक खाली टैंक को $6\frac{2}{3}$ मिनटों में भर सकते हैं। यदि A टैंक को भरने में B से 3 मिनट अधिक लेता है, तो A अकेले टैंक का एक-तीरा भाग भरने में कितने मिनट लेगा?

SSC CPO 11/12/2019 (Shift-02)

- (a) 6 (b) 5
(c) 5.5 (d) 4.5

23. Pipes A and B can fill a tank in 36 hours and 48 hours, respectively. Both pipes are opened together for 9 hours and then A is closed. Pipe B alone will fill the remaining part of the tank now in:

पाइप A और B एक टैंक को 36 घंटों और 48 घंटों में भर सकते हैं। दोनों पाइपों को 9 घंटों के लिए खोला जाता है और फिर पाइप A बंद कर दिया जाता है। पाइप B अकेले शेष भाग को भरने में कितने घंटों में लेगा?

SSC CPO 11/12/2019 (Shift-02)

- (a) $20\frac{1}{2}$ hours (b) 25 hours
(c) 27 hours (d) 24 hours

24. Pipes A and B together can fill a tank in 16 hours, whereas pipe C alone can empty the full tank in 24 hours. A and B were opened together for 10 hours and then closed. Pipe C was opened. The tank will now be emptied by C in:

पाइप A और B एक टैंक को 16 घंटों में भर सकते हैं, जबकि पाइप C अकेले पूरा टैंक को 24 घंटों में खाली कर सकता है। A और B एक साथ 10 घंटों के लिए खोले जाते हैं और फिर बंद कर दिए जाते हैं। अब पाइप C खोला जाता है। टैंक को खाली करने में C को कितने घंटों में लेना पड़ेगा?

SSC CPO 12/12/2019 (Shift-01)

- (a) 18 hours (b) 12 hours
(c) 10 hours (d) 15 hours

25. Pipes A and B are emptying pipes and can empty a tank in 6 hours and 16 hours, respectively, C is a filling pipe. All the three pipe were opened together. They took

$\frac{5}{18}$ of the tank. Pipe C alone can fill the tank in:

पाइप A और B खाली करने वाले पाइप हैं और एक टैंक को 6 घंटों और 16 घंटों में खाली कर सकते हैं। C एक भरने वाला पाइप है। तीनों पाइपों को एक साथ खोला जाता है। वे $\frac{5}{18}$ भाग टैंक को खाली करते हैं। पाइप C अकेले टैंक को भरने में कितने घंटों में लेगा?

SSC CPO 12/12/2019 (Shift-01)

- (a) 36 hours (b) 42 hours
(c) 48 hours (d) 40 hours

26. Two pipes A and B can fill a tank in 18 minutes and 24 minutes respectively. If both the pipes are opened simultaneously, then after how much time should pipe B be closed so that the tank is full in 12 minutes?

लक्ष्मी और सायल 24 और 36 मिनट में एक टैंक को भर सकते हैं। यदि दोनों पाइप एक साथ खोले जायें, तो 12 मिनट में टैंक को भरने के लिए पाइप B को कितने मिनट बाद बंद करना चाहिए?

SSC CPO 12/12/2019 (Shift-02)

- (a) 6 minutes (b) 9 minutes
(c) 8 minutes (d) 5 minutes

27. A tank is filled in 4 hours by three pipes A, B and C. The pipe C is twice as fast as B and pipe B is thrice as fast as A. How much time will pipe A alone take to fill the tank?

तीन पाइप A, B और C एक टैंक को 4 घंटों में भर सकते हैं। पाइप C पाइप B से दो गुना तेज है और पाइप B पाइप A से तीन गुना तेज है। पाइप A को टैंक को भरने में कितने घण्टे लगेंगे?

SSC CPO 12/12/2019 (Shift-02)

- (a) 25 hours (b) 40 hours
(c) 30 hours (d) 32 hours

28. Taps A and B can fill a tank in 15 minutes and 10 minutes, respectively while tap C can empty the full tank in x minutes. If all the three taps are opened together, the tank is filled completely in 8 minutes. Tap C

alone will empty $\frac{3}{8}$ part of the tank is:

29. Two pipes A and B can empty a full tank in 18 hours and 24 hours respectively. Pipe C alone can fill the tank in 36 hours. If the tank is $\frac{5}{6}$ full and all the three pipes are opened together, then in how many hours will the tank be emptied?

दो पाइप A और B एक पूर्ण टैंक को 18 घण्टों और 24 घण्टों में खाली कर सकते हैं। पाइप C एक टैंक को 36 घण्टों में भर सकता है। यदि टैंक $\frac{5}{6}$ भरा है और तीनों पाइप एक साथ खोले जायें, तो टैंक को खाली करने में कितने घण्टे लगेंगे?

SSC CPO 13/12/2019 (Shift-01)

- (a) 10 minutes (b) $10\frac{1}{2}$ minutes
(c) 9 minutes (d) $8\frac{1}{2}$ minutes

29. Pipes A and B can empty a full tank in 18 hours and 24 hours respectively. Pipe C alone can fill the tank in 36 hours. If the tank

is $\frac{5}{6}$ full and all the three pipes are opened together, then in how many hours will the tank be emptied?

लक्ष्मी और सायल 18 और 24 घण्टों में एक टैंक को खाली कर सकते हैं। पाइप C एक टैंक को 36 घण्टों में भर सकता है। यदि टैंक $\frac{5}{6}$ भरा है और तीनों पाइप एक साथ खोले जायें, तो टैंक को खाली करने में कितने घण्टे लगेंगे?

दो पाइप A और B एक पूर्ण टैंक को 18 घण्टों और 24 घण्टों में खाली कर सकते हैं। पाइप C एक टैंक को 36 घण्टों में भर सकता है। यदि टैंक $\frac{5}{6}$ भरा है और तीनों पाइप एक साथ खोले जायें, तो टैंक को खाली करने में कितने घण्टे लगेंगे?

SSC CPO 13/12/2019 (Shift-01)

- (a) $10\frac{1}{2}$ (b) $12\frac{1}{2}$
(c) 10 (d) 12

30. Pipes A and B can fill a tank in 18 minutes and $22\frac{1}{2}$ minutes,

respectively while pipe C can empty the full tank in 12 minutes. A and B are opened together for 6 minutes and then closed. Now C is opened. C alone will empty the tank in.

31. Pipe A can fill a tank of capacity 350 litres in $3\frac{1}{2}$ minutes. Pipe B

can fill a tank of capacity 780 litres in $8\frac{2}{3}$ minutes. How long

(in min) will it take to fill a tank of capacity 1615 litres if both pipes are opened together?

रजनी और सायल 350 लीटर की क्षमता वाले टैंक को $3\frac{1}{2}$ मिनट में भर सकते हैं। पाइप B 780 लीटर की क्षमता वाले टैंक को $8\frac{2}{3}$ मिनट में भर सकता है। यदि दोनों पाइप एक साथ खोले जायें, तो 1615 लीटर की क्षमता वाले टैंक को भरने में कितने मिनट लगेंगे?

SSC CPO 13/12/2019 (Shift-02)

- (a) $7\frac{1}{5}$ minutes
(b) $8\frac{2}{5}$ minutes
(c) 6 minutes
(d) 5 minutes

31. Pipe A can fill a tank of capacity

350 litres in $3\frac{1}{2}$ minutes. Pipe B

can fill a tank of capacity 780

litres in $8\frac{2}{3}$ minutes. How long

(in min) will it take to fill a tank of capacity 1615 litres if both pipes are opened together?

रजनी और सायल 350 लीटर की क्षमता वाले टैंक को $3\frac{1}{2}$ मिनट में भर सकते हैं। पाइप B 780 लीटर की क्षमता वाले टैंक को $8\frac{2}{3}$ मिनट में भर सकता है। यदि दोनों पाइप एक साथ खोले जायें, तो 1615 लीटर की क्षमता वाले टैंक को भरने में कितने मिनट लगेंगे?

कितने मिनट में टैंक को भरने में लगेगा?

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कितने मिनट में टैंक को भरने में लगेगा?

SSC CPO 13/12/2019 (Shift-02)

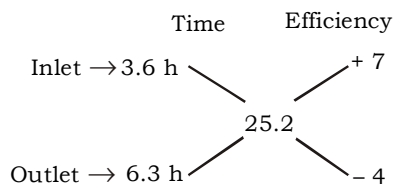
- (a) $7\frac{1}{2}$ (b) $8\frac{1}{2}$
(c) 9 (d) 8

ANSWER KEY

1.(d)	2.(d)	3.(c)	4.(d)	5.(b)	6.(d)	7.(b)	8.(a)	9.(a)	10.(c)
11.(a)	12.(d)	13.(a)	14.(d)	15.(c)	16.(c)	17.(c)	18.(a)	19.(b)	20.(a)
21.(a)	22.(b)	23.(c)	24.(d)	25.(c)	26.(c)	27.(b)	28.(c)	29.(d)	30.(a)
31.(b)									

SOLUTIONS

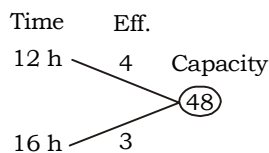
1. (d)



Then, required time

$$= \frac{25.2}{7-4} = \frac{25.2}{3} = 8.4 \text{ hrs}$$

2. (d)



Let the leakage pipe is c
 A/Q

$$\Rightarrow \frac{48}{A+B+C} - \frac{48}{A+B} = \frac{90}{60}$$

$$\Rightarrow \frac{48}{7-C} - \frac{48}{7} = \frac{3}{2}$$

$$\Rightarrow 48 \left(\frac{(7-7+C)}{7(7-C)} \right) = \frac{3}{2}$$

$$\Rightarrow \frac{C}{48-7C} = \frac{1}{32}$$

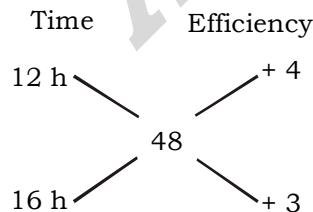
$$\Rightarrow 32C = 48 - 7C$$

$$\Rightarrow C = \frac{49}{39} \rightarrow \text{eff.}$$

Now time taken by C to empty the

$$\text{tank} = \frac{48}{\frac{49}{39}} = \frac{48 \times 39}{49} = 38 \frac{10}{49} \text{ hr.}$$

Alternate Method:



ATQ,

A and B has to work for extra 90 minutes.

$$\Rightarrow (A+B) \times \frac{90}{60} = C \left[\frac{48}{7} + \frac{90}{60} \right]$$

$$\Rightarrow 7 \times \frac{3}{2} = C \times \frac{96+21}{14}$$

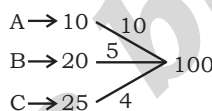
$$\Rightarrow \frac{7 \times 3}{2} = C \times \frac{117}{14}$$

$$\Rightarrow C = \frac{49}{39}$$

Hence, time taken by C to empty

$$\text{the tank} = \frac{48 \times 39}{49} = 38 \frac{10}{49} \text{ hrs.}$$

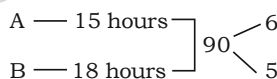
3. (c)



Time	2 Hr.	2 Hr.	
Tap	A + B + C	A + B	A
Work Done	38	30	Remain = 32

$$\begin{aligned} \text{Total work done by A in} \\ \text{percentage} &= \frac{10 \times 4 + 32}{100} \times 100 \\ &= 72\% \end{aligned}$$

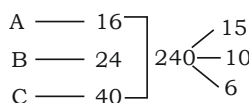
4. (d)



Total time when tank will be filled

$$\text{by A and B} = \frac{90}{11} = 8 \frac{2}{11} \text{ hours}$$

5. (b)



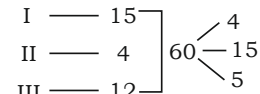
$$\begin{aligned} \text{Total work done by (A + B + C)} \\ \text{in 10 days} &= (15 + 10 - 6) \times 10 \\ &= 190 \end{aligned}$$

$$\text{Remaining work} = 240 - 190 = 50$$

$$\text{Remaining work done by (B + C)}$$

$$= \frac{50}{10-6} = \frac{50}{4} = 12 \frac{1}{2} \text{ hours}$$

6. (d)



Total time taken by three pipes

$$\text{to fill empty tank} = \frac{60}{4+15-5}$$

$$= \frac{60}{14} = \frac{30}{7} \text{ hours}$$

7. (b)

Let, B be can fill the tank in x hour.

$$A \rightarrow (x-5) \text{ hours}$$

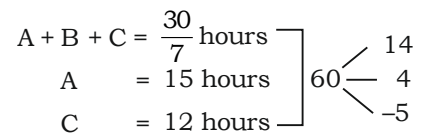
$$A \& B \rightarrow 6 \text{ hours}$$

$$\text{So, } \frac{1}{(x-5)} + \frac{1}{x} = \frac{1}{6}$$

$$x = 15 (\text{satisfies the equation})$$

Hence, B can fill the cistern in 15 hours.

8. (a)



$$B's \text{ efficiency} = [14 - (4 - 5)] = 15$$

$$B \text{ fill the tank} = \frac{60}{15} = 4 \text{ hours}$$

9. (a) Let, B be can fill the tank in x hour.

$$A \rightarrow (x-5) \text{ hours}$$

$$A \& B \rightarrow 6 \text{ hours}$$

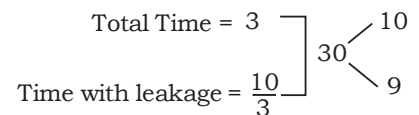
$$\text{So, } \frac{1}{(x-5)} + \frac{1}{x} = \frac{1}{6}$$

$$x = 15 (\text{satisfies the equation})$$

$$A \text{ can fill the tank in} = x - 5$$

$$= 15 - 5 = 10 \text{ hours}$$

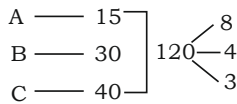
10. (c)



Drain the whole water by leak

$$= \frac{30}{10-9} = 30 \text{ hours}$$

11. (a)



A does work 6 am to 10 am
 $= 4 \times 8 = 32$

B does work 8 am to 10 am
 $= 2 \times 4 = 8$

Total work done $= 32 + 8 = 40$

Remaining work $= 120 - 40 = 80$

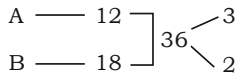
(A + B + C) complete 80 work

$$= \frac{80}{8+4+3} = \frac{80}{15} = \frac{16}{3}$$

$= 5$ hours 20 minutes

Thus, Tank will be filled at $= 3 : 20$ pm

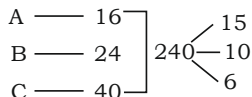
12. (d)



$$\text{Total time taken} = \frac{36}{3+2} = \frac{36}{5}$$

$= 7$ hours 12 minutes

13. (a)

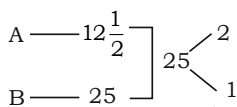


(A + B + C)'s 10 hours work done
 $= (15 + 10 + 6) \times 10$
 $= 190$

Remaining work $= 240 - 190 = 50$
 Remaining work (A + B) completed

$$\text{in} = \frac{50}{15+10} = 2 \text{ hours}$$

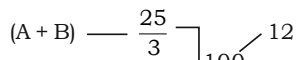
14. (d)



$$(A + B) = \frac{25}{3} \text{ hours}$$

$$\text{With Leakage} = \frac{25}{3} + 1\frac{2}{3}$$

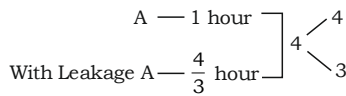
$$= \frac{25}{3} + \frac{5}{3} = 10 \text{ hours}$$



With Leakage — 10
 Time taken by the leak to empty the cistern -

$$= \frac{100}{12-10} = 50 \text{ hours}$$

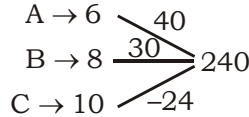
15. (c)



Leakage pipe can empty the tank

$$\text{in} = \frac{4}{4-3} = 4 \text{ hours}$$

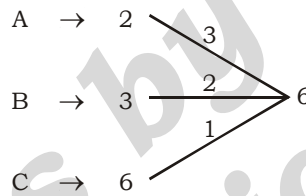
16. (c)



All pipes are opened together, then the tank will get filled in

$$= \frac{240}{(40+30-24)} = \frac{240}{46} = 5\frac{5}{23} \text{ hours}$$

17. (c)



Pipe A & C can fill the tank in

$$= 1 + \frac{1}{4} = \frac{5}{4} \text{ hrs.}$$

$$\text{Pipe A \& C filled the tank} = \frac{5}{4} \times 4$$

$= 5$ unit

Pipe B should be closed after

$$= \frac{1}{2} \times 60 = 30 \text{ minutes}$$

18. (a)

(A, B and C) together can fill a cistern in 12 hours

Let, the total work $= 60$

$$\text{efficiency of (A, B and C)} = \frac{60}{12} = 5$$

Work done by all three pipes in 4 hours $= 4 \times 5 = 20$

Remaining work $= (60 - 20) = 40$

A and B together take 10 hours to fill the tank.

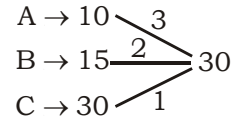
$$\text{efficiency of (A and B)} = \frac{40}{10} = 4$$

efficiency of C $= (5 - 4) = 1$

'C' alone fill two-thirds of the

$$\text{cistern} = \frac{60 \times \frac{2}{3}}{1} = 40 \text{ hours}$$

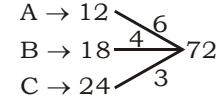
19. (b)



(A, B, C) opened together for 3 hours $= (3 + 2 + 1) \times 3 = 18$

$$\text{tank in} = \frac{30}{18} \times 30 = 50 \text{ hours}$$

20. (a)

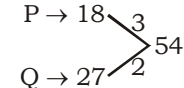


All the pipes opened together for 7 minutes $= (6 + 4 + 3) \times 7 = 91$

So, the water that overflow $= (91 - 72) = 19$

$$\% \text{ change} = \frac{19}{72} \times 100\% = 26\frac{7}{18}\%$$

21. (a)



'R' can empty the full tank in 54 minutes

$$\text{So, efficiency of 'R'} = \frac{54}{54} = 1$$

P and Q opened together for 6 minutes $= (3 + 2) \times 6 = 30$

R can empty the tank

$$= \frac{30}{1} = 30 \text{ min.}$$

22. (b) Let, B can fill the tank in x

$$A \rightarrow (x + 3)$$

$$\text{So, } \frac{1}{x+3} + \frac{1}{x} = \frac{3}{20}$$

On solving, $x = 12$

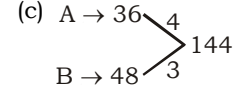
B $\rightarrow 12$

A $\rightarrow 15$

So, pipe A can fill $\frac{1}{3}$ of the tank

$$\text{in} = 15 \times \frac{1}{3} = 5 \text{ minutes}$$

23. (c)



Both pipe opened together for 9 hours $= (4 + 3) \times 9 = 63$

Remaining $= (144 - 63) = 81$

'B' alone fill the remaining part

$$= \frac{81}{3} = 27 \text{ hours}$$

24. (d)

$$\begin{array}{rcl} A + B & \rightarrow & 16 \begin{array}{l} \nearrow 3 \\ \searrow -2 \end{array} \\ & & 48 \\ C & \rightarrow & 24 \end{array}$$

(A + B) opened together for 10 hours and then closed

Tank filled = $3 \times 10 = 30$

'C' will emptied the tank filled in

$$= \frac{30}{2} = 15 \text{ hours.}$$

25. (c)

$$\begin{array}{rcl} A & \rightarrow & 6 \begin{array}{l} \nearrow 8 \\ \searrow 3 \end{array} \\ & & 48 \\ B & \rightarrow & 16 \end{array}$$

Let the efficiency of pipe 'C' be x .

$$\text{Then, } (8 + 3 - x) \times \frac{80}{60} = 48 \times \frac{5}{18}$$

$$\Rightarrow (11 - x) \times \frac{4}{3} = \frac{40}{3}$$

$$\Rightarrow x = 1$$

Hence, pipe 'C' alone can fill the

$$\text{tank in } = \frac{48}{1} = 48 \text{ hours}$$

26. (c)

$$\begin{array}{rcl} A & \rightarrow & 18 \begin{array}{l} \nearrow 4 \\ \searrow 3 \end{array} \\ & & 72 \\ B & \rightarrow & 24 \end{array}$$

Work done by pipe A in 12 min

$$= 4 \times 12 = 48$$

$$\text{Remaining work} = 72 - 48 = 24$$

$$\text{Time taken by pipe B} = \frac{24}{3} = 8 \text{ min}$$

Thus, pipe B should be closed after 8 min.

27. (b)

$$\begin{array}{rcl} A & B & C \\ 1 & 3 & 6 \end{array}$$

$$\text{Tank capacity} = (1 + 3 + 6) \times 4 = 40$$

$$\text{'A' alone take to fill the tank} = \frac{40}{1}$$

$$= 40 \text{ hours}$$

28. (c)

$$\begin{array}{rcl} A & \rightarrow & 15 \begin{array}{l} \nearrow 8 \\ \searrow 12 \end{array} \\ B & \rightarrow & 10 \end{array} \begin{array}{l} 120 \\ 15 \end{array}$$

A + B - C $\rightarrow$ 8
Let tap 'C' will empty the tank in 'x' minutes.

ATQ,

$$8 + 12 - x = 15$$

$$20 - x = 15$$

$$x = 15$$

$$\text{Total Work} = 120$$

'C' alone will empty $\frac{3}{8}$ part of the

$$\text{tank} = \frac{120 \times 3}{8} = 9 \text{ minutes}$$

29. (d)

$$\begin{array}{rcl} A & \rightarrow & 18 \begin{array}{l} \nearrow -4 \\ \searrow -3 \end{array} \\ B & \rightarrow & 24 \\ C & \rightarrow & 36 \end{array} \begin{array}{l} 72 \\ +2 \end{array}$$

$$\text{Total capacity of tank} = 72$$

$$\frac{5}{6} \text{ of the tank} = 72 \times \frac{5}{6} = 60$$

all three pipes are opened together then,

Required time to emptied the tank

$$= \frac{60}{-4 - 3 + 2} = \frac{60}{-5} = 12 \text{ hours}$$

30. (a)

$$\begin{array}{rcl} A & \rightarrow & 18 \begin{array}{l} \nearrow 10 \\ \searrow 8 \end{array} \\ B & \rightarrow & \frac{45}{2} \\ C & \rightarrow & 12 \end{array} \begin{array}{l} 180 \\ -15 \end{array}$$

$$\text{T.W} = 180$$

Work done by pipe A and pipe B in 6 min = $(10 + 8) \times 6 = 108$

Pipe 'C' alone empty the tank

$$= \frac{108}{15} = 7 \frac{1}{5} \text{ min}$$

31. (b)

Pipe A can fill a tank in $3 \frac{1}{2}$ min

$$= 350 \text{ litres}$$

Pipe A can fill a tank in 1 min

$$= 350 \times \frac{2}{7}$$

$$= 100 \text{ litres}$$

Pipe B can fill a tank in $8 \frac{2}{3}$ min

$$= 780 \text{ litres}$$

Pipe B can fill a tank in 1 min

$$= 780 \times \frac{3}{26} = 90 \text{ litres}$$

Pipe A and pipe B together fill the tank in 1 min = $100 + 90 = 190$ litres

pipe A & pipe B can fill the tank of 1615 Litre in

$$= \frac{1615}{190} = 8 \frac{1}{2} \text{ min}$$





TIME & DISTANCE

11

प्रतिष्ठा

1. A person crosses a 900-metre long street in 6 minutes. The speed of the person, in km/h, is: किसी शहरी सड़क पर 900 मीटर लंबी सड़क को 6 मिनट में तय करने वाले व्यक्ति की गति, कि.मी./घं. में, क्या होगी?

SSC CPO 03/10/2023 (Shift-01)

- (a) 5 (b) 9
(c) 10 (d) 8
2. If a truck moves at a constant speed of 30 km/h for 1 kilometre and 45 km/h for the next 1 kilometre. What is the average speed of the truck?

यदि एक ट्रक 30 कि.मी./घं. की स्थिर गति से 1 कि.मी. तय करता है और फिर 45 कि.मी./घं. की स्थिर गति से अगले 1 कि.मी. तय करता है। तो ट्रक की औसत गति क्या होगी?

SSC CPO 03/10/2023 (Shift-01)

- (a) 36 km/h (b) 38 km/h
(c) 32 km/h (d) 34 km/h
3. A tourist van travels the distance of 35 km from Dehradun to Mussoorie at an average speed of 36 km/h and returns at 60 km/h. What is the approximate average speed (in km/h) of the tourist van for the entire journey? किसी पर्यटकीय बस को देहरादून से मुसोरी तक 35 कि.मी. की दूरी 36 कि.मी./घं. की औसत गति से तय करनी पड़ी और वापस 60 कि.मी./घं. की औसत गति से तय करनी पड़ी। तो पूरी यात्रा के लिए औसत गति (कि.मी./घं.) का अनुमान क्या होगा?

SSC CPO 03/10/2023 (Shift-01)

- (a) 45 (b) 48
(c) 50 (d) 60
4. A man runs for 40 km. The time taken by him in the first 10 km is twice the time taken by him in the second 10 km. The time taken in the third 10 km is half of the time taken in the fourth 10 km, and the time taken in the fourth 10 km is equal to the time taken in the first 10 km. If his speed in the first 10 km is 40 km/h, then what is the average speed for 40 km?

किसी व्यक्ति ने 40 कि.मी. दूरी तय की। पहले 10 कि.मी. में ली गई समय दूसरे 10 कि.मी. में ली गई समय का दोगुना है। तीसरे 10 कि.मी. में ली गई समय चौथे 10 कि.मी. में ली गई समय का आधा है, और चौथे 10 कि.मी. में ली गई समय पहले 10 कि.मी. में ली गई समय के बराबर है। यदि पहली 10 कि.मी. की गति 40 कि.मी./घं. है, तो 40 कि.मी. की औसत गति क्या होगी?

SSC CPO 03/10/2023 (Shift-01)

- (a) $\frac{160}{3}$ km/h (b) $\frac{70}{3}$ km/h
(c) 50 km/h (d) 40 km/h
5. A thief is noticed by a policeman from a distance of 300 m. The thief starts running and the policeman starts chasing him. The thief and policeman run at the rate of 11 km/h and 13 km/h, respectively. After running for how many kilometres will the policeman be able to catch the thief?

300 मीटर की दूरी से एक चोर को पुलिस ने पकड़ लिया। चोर दौड़ने लगा और पुलिस उसे पकड़ने के लिए दौड़ने लगी। चोर 11 कि.मी./घं. की गति से दौड़ रहा है और पुलिस 13 कि.मी./घं. की गति से दौड़ रही है। पुलिस चोर को पकड़ने के लिए कितनी दूरी तय करेगी?

SSC CPO 03/10/2023 (Shift-02)

- (a) 1.85 (b) 1.75
(c) 1.65 (d) 1.95
6. A person covers 28 km while walking at a speed of 8 km/h. How much distance (in km) will he cover in same time if he walks at a speed of 6 km/h?

किसी व्यक्ति ने 8 कि.मी./घं. की गति से 28 कि.मी. दूरी तय की। यदि वह 6 कि.मी./घं. की गति से वही दूरी तय करता है, तो वह कितनी दूरी तय करेगा?

SSC CPO 03/10/2023 (Shift-03)

- (a) 36 (b) 21
(c) 28 (d) 32

7. An inspector is 288 metres behind a thief. The inspector runs 42 metres and the thief runs 30 metres in a minute. In how much time will the inspector catch the thief?

एक निरीक्षक एक चोर से 288 मीटर पीछे है। निरीक्षक 42 मीटर और चोर 30 मीटर प्रति मिनट दौड़ता है। निरीक्षक को चोर को पकड़ने में कितना समय लगेगा?

SSC CPO 04/10/2023 (Shift-01)

- (a) 20 minutes (b) 24 minutes
(c) 19 minutes (d) 21 minutes
8. A car, during its entire journey of 5 hours, travels the first 45 minutes at a certain speed, the next 75 minutes at a speed of 85 km/h, and the last 3 hours at a speed of 70 km/h. During its entire journey, the average speed of the car is found to be 73 km/h. What is the speed (in km/h) of the car during the first 45 minutes?

5 घंटे की यात्रा के दौरान, एक कार पहले 45 मिनट एक निश्चित गति से चलती है, अगले 75 मिनट 85 कि.मी./घं. की गति से, और शेष 3 घंटे 70 कि.मी./घं. की गति से। पूरी यात्रा के लिए औसत गति 73 कि.मी./घं. पाई गई है। तो पहले 45 मिनट की गति (कि.मी./घं.) क्या होगी?

SSC CPO 04/10/2023 (Shift-02)

- (a) 62
(b) 65
(c) 72
(d) 68
9. Travelling a distance of 1000 km, a train slowed down due to repairs of the tracks. Its average speed for the trip reduced by 75 km/h and the time of travel increased by 3 hours. The original duration of the travel is:

1000 km सक सलसह सकर्यसकसपल
खसक सनयनहसक सवमबस सिकसख
8 न सवसप्रकुसत्र स चसकसै सित्र क
र हस2 है सनस75 km/h सक सकन सव
मह सबस चसकसक न सु सइसपम
महसबस चसक सनै स वस सकहद सब

SSC CPO 04/10/2023 (Shift-02)

- (a) 5 hours (b) 6 hours
(c) 6.5 hours (d) 5.5 hours
10. A train covers a distance of 540 km between two stations in 240 minutes. It travels at a speed of 90 km/h to another station in 5 hours. What is the average speed of the train (in km/h)?

किसक सलसह सकर्यसक स2 है स 90 km सक
लस सन चसकसदससह सकर्य सबस बसर ज
km/h सक स2 है स स2 सइससकसक 6
इससहसकसक स चसक सकर्य सबसख
क स हस2 है स (km/h सक) सकहद सब

SSC CPO 04/10/2023 (Shift-02)

- (a) 100 (b) 112
(c) 110 (d) 120
11. The time taken to travel the same distance by three cars is in the ratio of 12:15:10. What is the ratio of the speeds of the three cars?

हं दसकसकसक नदसलसह सकर्यसक
प्रदस है स न सकसक देहस0 नस0 स
0 जसबसहं दसकसक स2 है सिकसक देह
जसकय

SSC CPO 04/10/2023 (Shift-02)

- (a) 4 : 5 : 6 (b) 5 : 4 : 6
(c) 5 : 6 : 4 (d) 4 : 6 : 5
12. Jimmy has to cover a distance of 88 km in 16 hours. If she covers

half of the journey in $\frac{3}{4}$ time,
then what should be her speed to
cover the remaining distance in
the time left?

सन सकस0 सइसससससकन सक सलसह
कय सबस ससबस 8 स चसक $\frac{3}{4}$ स न सन
ह सकर्य सबसससस न सनससससह
कयसकसै सिक क सप्रस सवद स सग

SSC CPO 04/10/2023 (Shift-03)

- (a) 12 km/h (b) 10 km/h
(c) 13 km/h (d) 11 km/h

13. A vehicle is going at one-fourth of its usual speed and it takes an extra 45 minutes to reach its destination. Its usual time to cover the same distance is:

किसकस दं स जह सप्रस सिकड चस
प्रस ससससबस चसक स दसप्रही
हकसे ब दसस ससदस सससै प्रहसब
नदसलसह सकर्यसकसक जह स न सब

SSC CPO 04/10/2023 (Shift-03)

- (a) 20 minutes
(b) 15 minutes
(c) 10 minutes
(d) 30 minutes
14. A boy goes from home to school at a speed of 30 km/h and returns back at a speed of 70 km/h. What is his average speed for the journey?

किसै तकस जसकन इषसक स2 है स
इस ससस सससबस चसकसकन इषस
क स2 है स सवे, सै चसबस सै स
कसै सिक क स हस2 है सससकय

SSC CPO 05/10/2023 (Shift-01)

- (a) 48 km/h (b) 38 km/h
(c) 42 km/h (d) 36 km/h
15. At 7 : 30 P.M. the owner of a Cycle noticed that a thief is taking away his cycle from his home and is cycling in a particular direction at an estimated speed of 10 km per hour. He informed the police about the theft and the policeman started from the same point, half an hour later than the time of the theft but with a speed of 12 km per hour. At what time will Policeman catch the thief?

7 : 30 PM सै सकस चसक सकसन सै क
दसल ससकसक स2 चसक क स चसक सक
क सइस स2 सकसकसक ससससस
न सै ससससबस चसक स ससस स
इषसक सै प्रसस2 है स स चसक स2 है
ससबस दस है, सकस2 ससक स द
लसस है, कन दस2 ससकस न स
न सइसससस ससस ससस ससस ससस
क स2 है स सस ससस स2 चसकसै
कयससक सै सै, कन स ससससह
पमसै कत सै प्रग

SSC CPO 05/10/2023 (Shift-01)

- (a) 10:00 PM (b) 10:30 PM
(c) 10:45 PM (d) 9:30 PM

16. Julie and Soma start from the same point and walk in opposite directions. Julie walks 4 km/h faster than Soma. After 4 hours they are 40 km apart. How fast did each walk?

मै स चस ससससस ससस ससस सकर्य
बस चसक यंससस सनस2 है हसबसमै
चस सससस इषससहस स हं सबससइस
कसपससससससकन सलसबसस कसै स
सहद सस स सै ग

SSC CPO 05/10/2023 (Shift-02)

- (a) Julie – 7 km/h; Soma – 3 km/h
(b) Julie – 8 km/h; Soma – 4 km/h
(c) Julie – 9 km/h; Soma – 5 km/h
(d) Julie – 10 km/h; Soma – 6 km/h
17. A runner runs a 750-metre race in 54 seconds. Find the runner's speed (in km/h).

किस 7 कस ससस ससस ससस सस स
न स सससससस 7 कस ससस (सकन इषस
न) ससससक स

SSC CPO 05/10/2023 (Shift-02)

- (a) 40 (b) 30
(c) 14 (d) 50
18. A fast local of Mumbai takes 45 minutes less than a slow local for a journey of 150 km. If the speed of the fast local is 10 km/h more than that of the slow local, find the speed (in km/h) of the slow local train.

नससक सिकससस सै सै स0 जसकन सक
चससस न सै सै सक सै दसस ससस
कन सै हं सबस ससस सै सक सससस
सै सक ससस स0 जसकन इषस 8 क
बससस न सै सै सकस ससस (सकन इषस
न) ससससक

SSC CPO 05/10/2023 (Shift-03)

- (a) 30 (b) 40
(c) 45 (d) 35
19. A man covers a certain distance by bike. If he covers 25% of the distance at the speed of 25 km/h, 50% of the distance at the speed of 50 km/h and the remaining distance at the speed of 12.5 km/h, find his average speed over the whole journey.

30. The speeds of two bodies are in the ratio 2 : 3. If the difference in the time taken to cover 50 m is 10 sec, then find the difference in their speeds.

लसरे तर्षक स2 है सकष् देसहससप्स सबद
रसस? जसनं सकं सलसं सह सकर्दसर्नसै प्र
न सकष् हसस0 जप्स कतसबदसहसदकं
2 है सनस हससलसकं सपि

SSC CPO 10/11/2022 (Shift-02)

- (a) $\frac{8}{9}$ m/sec (b) $\frac{5}{6}$ m/sec
(c) $\frac{6}{5}$ m/sec (d) $\frac{7}{5}$ m/sec

31. A truck goes from Haryana to Bangalore with an average speed of 60 km/h. The journey takes 30 hours. It returns from Bangalore to Haryana on the same road with an average speed of 40 km/h. What was the average speed of the truck during the whole journey?

किसखसबस जप्स सपसै प्सहकसजि
स्कनू इषसकं स हस2 है स समहसबद
जप्ससु जसइषसै प्रहसबस बसपसै प्स
बस जप्सकससै सस स तकसे सप्ज
स्कनू इषसकं स हस2 है स सै हसबद
सै जप्सकसलसदसखसकं स हस2 है
I प्स, ंग

SSC CPO 10/11/2022 (Shift-02)

- (a) 60 km/h (b) 40 km/h
(c) 50 km/h (d) 48 km/h

32. In a journey of three unequal laps, a car covers a distance of 200 km in 4 h in the first lap, while another 162 km at the speed of 15 m/s in the second lap. It covered the remaining distance of the final lap in 4 h such that the average speed of the car for entire journey was 50 km/h. What was speed of the car in the third lap of the journey?

हं दस, नदसउषसकं स जप्ससकसकय
बै सउषससस-जससकनं सकं सलसं सइषस
नसह सकयं सबदसपसकससै सउषससस0
स्कनं सकं सलसं स0? सनू, ससकं स2 है स सह
कयं सबदस दस हससउषसकं सधसलस
कसससइषससस स कयसह सकसलसस
सै स जप्सकससै ससकसकं स हस2 है
? जससकनू इषससससस जप्सकसहं सउषस
नसकसकं स2 है सा प्स, ंग

SSC CPO 10/11/2022 (Shift-02)

- (a) 47 km/h (b) 52 km/h
(c) 42 km/h (d) 45 km/h

33. A man goes 24 m towards east and then 10 m towards north. How far is he away from his initial position?

कसक प्सं सनससं खसै दसकं स प्स द
सै जससं ससससकं स प्ससहसबदस
नं दं सै सउषससहस ससकहं सलससब

SSC CPO 10/11/2022 (Shift-02)

- (a) 23 m (b) 25 m
(c) 26 m (d) 24 m

34. A bus travels at 100 km/h for the first 1/2 hour. Later it travels at 80 km/h. Find the time taken by the bus to travel 290 km.

कसप सै बै सस-सइषसकससै सस0 ज
स्कनू इषसकं स2 है स स2 हं सबदसपसस
बस ससससकनू इषसकं स2 है स स2 हं
बदस-जससकनं सकं सलसं सह सकर्दसकसै
प्र सखससै प्स प्स न सलससकं सपि

SSC CPO 10/11/2022 (Shift-03)

- (a) 4 hours (b) 3.5 hours
(c) 3 hours (d) 2.5 hours

35. The speeds of A and B are in the ratio 3 : 5. A takes 30 minutes more than B to reach the destination. In how much time does A reach the destination?

A न प्सB क स2 है स सप्स? सकस देसहस
बदसप्रही सहकसे बस दसससA, B क सहेस द
नसु जससदसस स कस न सै हसबदसA
प्रही सहकससहस न सनसे बस हसबद

SSC CPO 11/11/2022 (Shift-01)

- (a) 1 hour 15 minutes
(b) 1 hour 10 minutes
(c) 1 hour
(d) 1 hour 5 minutes

36. During a journey of 120 km, Rahi drives first 60 km at the speed of 60 km/h, next 30 km at 60 km/h and the remaining 30 km at the speed of 30 km/h. Determine the average speed.

0-जससकनं सकं स जप्सकसलसदससस से बै
जससकनं सकं सलसं सजसकनू इषसकं सप्रह
सै स सससकनं सकं सलसं सजसकनू इषस
कं सप्रहस स प्ससधससु जससकनं सकं सलसं
जससकनू इषसकं सप्रहस सह सकयं सबद
न हससप्रहसलससकं सपि

SSC CPO 11/11/2022 (Shift-03)

- (a) 48 km/h (b) 33.33 km/h
(c) 50 km/h (d) 40 km/h

37. A car starts at 3 p.m. at a speed of 50 km/h. Another car follows it at 4 p.m. at a speed of 75 km/h. At what time will both the cars meet?

कसकसस3 p.m. सस? जससकनू इषसकं
2 है स स2 दसै ससकयं सबदसकससस
कसस4 p.m. सस? ससकनू इषसकं स2 है
सै ससकयसधस सकयं सबदसलसकस
स न से सससै प्र ग

SSC CPO 11/11/2022 (Shift-03)

- (a) 6 pm (b) 5 pm
(c) 7 pm (d) 8 pm

38. A thief is spotted by a policeman from a distance of 250 m. When the policeman starts the chase, the thief also starts running. Assuming that the speed of the thief is 10 km/h and that of the policeman is 12 km/h, how far would the thief have run before he is caught?

कसै सै, कनं स2 प्सकस-जसनं सकं सलसं
सलसहसबदसपसे सै, सकनं सस कसै
कयसै ससकयसबदसहस2 प्ससं सलसद
ससकयसबदस बसनदकससस2 प्सकं
2 है स0 जससकनू इषसकं ससै सै, कनं स2
2 है स0-ससकनू इषसकं सससस प्स दसै कतव
मर्दसकसै बै ससकहं सलसलसद स कससवषण

SSC CPO 09/11/2022 (Shift-01)

- (a) 4 km (b) 1.25 km
(c) 3 km (d) 2 km

39. A policeman sees a thief at a distance of 150 m. He starts chasing the thief who is running at a speed of 5 m/sec, while the policeman chases with a speed of 7 m/sec. Find the distance covered by the thief when he is caught by the policeman.

कसै सै, कनं स2? जसनं सकं सलसं सस क
2 प्सकसलसहसबदस बस? सनू, कजत ससकं
2 है स सउषसससस2 प्सकस सै स कय
न प्ससकयसबदस मपसस सै, कनं स
नू कजतसकं स2 है स सै ससकयसबद
सै, कनं सससस कतवमर्दसकस न सहक
2 प्सससस सकं सप्रसलसं सलससकं सपि

SSC CPO 09/11/2022 (Shift-02)

- (a) 285 m (b) 325 m
(c) 375 m (d) 295 m

40. A thief, seeing a policeman from a distance of 120 metres, starts running at a speed of 7 km/h. The policeman chases immediately with a speed of 8 km/h and the thief is caught. What is the distance run by the thief?

किस 2 घंटा 0 मिनट जमाने खसक सलख से यसस्क
 है, कन अकर्सलक यकस थसस्कन इषकसक
 2 है म सउषप्रदषे छकसक यकसकसे है, कन 3
 हकसकसकन इषकसक स है म से यकसक
 बक पस 2 घंटा कसे कत है हसकस 2 घंटाक
 उष सप्रकसलख सकहद सब

SSC CPO 11/11/2022 (Shift-02)

- (a) 820 m (b) 780 m
 (c) 840 m (d) 80 m

41. A and B run a 12 km race on a circular track of length 1200 m. They complete one round in 300 seconds and 400 seconds respectively. After how much time from start will the faster person meet the slower person for the last time?

A क पसB स 0 मिनट से ससक यकसक
 य 0 मिनट स सलख है प्रकसकस नथ
 जस कत स पस जस कत ससक स 1 कय
 कसकसकसे छकसक ससकहदस न सपल
 हमसे शहकस नसे शहस सहनसपससै प्रण

SSC CPO 10/11/2022 (Shift-03)

- (a) 2400 sec (b) 8400 sec
 (c) 9600 sec (d) 10800 sec

42. In a race of 1200 m, Ram can beat Shyam by 200 m or by 20 sec. What must be the speed of Ram? 1200 m क सस ससकस अध जसकस 200 m पस जस कतस सबकस कहसकसकन क स है सा पसक स पसग

SSC CPO 11/11/2022 (Shift-01)

- (a) 14 m/sec (b) 12 m/sec
 (c) 10 m/sec (d) 16 m/sec

43. A gives B a head-start of 10 seconds in a 1500 m race and both finish the race at the same time. What is the time taken by A (in minutes) to finish the race if speed of B is 6 m/s?

A, 0 मिनट खसक सलख ससकसB कस 0 मिनट
 कतसक सधस हस (बत डकस) सलखसक
 पसलदस कसब म न ससलख है यकसक
 बस ससB क स है ससिन, अबकसA
 कसलख है यकसकससस (सदखन) सकहद
 न सै प्रण

SSC CPO 11/11/2022 (Shift-02)

- (a) 3 (b) 4
 (c) 8 (d) 5

44. A can run 250 m in 25 sec and B in 30 sec. How many metres start can A give to B in a km race so that the race may end in a dead-heat?

मिनट सक सलखसह सकसससA कस 25
 sec कस न सै प्रहसकसमपसकसहद सब
 लखसह सकसससB कस 30 sec कस न
 प्रहसकसकसकन सक सलखससA, B
 कसकसहदस खसक सपसससस, सलख
 खसकससस

SSC CPO 11/11/2022 (Shift-03)

- (a) 169.53 m (b) 173.82 m
 (c) 166.67 m (d) 186.34 m

45. Geeta runs $\frac{5}{2}$ times as fast as Babita. In a race, if Geeta gives a lead of 40 m to Babita, then find the distance from the starting point where both of them will meet (correct up to two decimal places).

प्रहसपप हस स $\frac{5}{2}$ सप्रसससलख सब
 कसस ससस ससप्र हसपप हसकसस
 क सपससस सबकस छकसससस स
 ससकसक सलख ससकस ससससस
 लदससै प्र स (लख) ससकससससस
 हकसे ससकह)

SSC CPO 10/11/2022 (Shift-01)

- (a) 66.67 m (b) 65 m
 (c) 65.33 m (d) 66 m

46. Three persons P, Q, R run along a circular track at speeds of 3 km/h, 4 km/h, 6 km/h, respectively. If the length of the track is 36 km, then after how much time will they meet again at the starting point?

हदसी शहसP, Q, R सकसकसक
 य नथस 3 km/h, 4 km/h, 6 km/h
 क स है म सलख ससकस ससकसक सै प्रक
 36 km सबकसससै य ससक
 यकसहदस न सपसससै प्रण

SSC CPO 10/11/2022 (Shift-02)

- (a) 38 hours (b) 36 hours
 (c) 24 hours (d) 28 hours

47. How much percentage should a racer increase speed to reduce the time by 20% to cover a fixed distance?

कससस हसलख सकसस सकसससससस
 न सकनसकसससै सस कसकसकसहद
 कसस है सपसक स पस

SSC CPO 10/11/2022 (Shift-03)

- (a) 25% (b) 30%
 (c) 40% (d) 35%

48. A takes 2 hours 30 minutes more than B to walk 40 km. If A doubles his speed, then he can make it in 1 hour less than B. How much time (in hours) does A require for walking a 40 km distance?

40 कस सलखसह सकसससA सकससB
 2 सससससससस कसै प्रहससस ससA
 द स है सससस सकसससससससस सB
 स ससससससस ससस सकसस कहसस
 A सकसस 40 कस सलखसह सकसससै प्रद
 है पस न स (इषसस) ससकसकस

SSC CPO 23/11/2020 (Shift-1)

- (a) 7 (b) 5
 (c) 6 (d) 9

49. A person travels a distance of 300 km and then returns to the starting point. The time taken by him for the outward journey is 5 hours more than the time taken for the return journey. If he returns at a speed of 10 km/h more than the speed of going, what is the average speed (in km/h) for the entire journey?

कससै शहस 300 कस सलखसह सकससस
 पसस थस पससससससससससस, स ससस
 कससससससससससै प्रस न सस, स
 नसै प्रस न स सससससससससससससस
 मससक स है म स 10 km/h सकस क क
 2 है म सस, सै ससससससससससससस
 लखसह हस है स (km/h न) ससकसकस

SSC CPO 23/11/2020 (Shift-2)

- (a) 24
 (b) 30
 (c) 20
 (d) 15

50. A bus covers a 50 km distance in 1 hour 15 minutes, whereas the same distance is covered by a car in 45 minutes. What is the ratio of the speed of the bus to the speed of the car?

किसी 50 km की दूरी को 5 घंटे में तय करने में सफल होता है। वह अपनी गति को दोगुना करके चलता है। वह इस दूरी को कितने घंटों में तय करेगा?

SSC CPO 23/11/2020 (Shift-2)

- (a) 1 : 3 (b) 3 : 1
(c) 5 : 3 (d) 3 : 5

51. A bus covers a 60 kilometre distance in 1 hour 30 minutes, whereas the same distance is covered by a car in 45 minutes. What is the ratio of the speed of the car to the speed of the bus?
- किसी 60 km की दूरी को 1 घंटे 30 मिनट में तय करने में सफल होता है। वहीं एक कार 45 मिनट में इसी दूरी को तय कर लेती है। कार की गति और बस की गति का अनुपात क्या होगा?

SSC CPO 24/11/2020 (Shift-01)

- (a) 2 : 1 (b) 1 : 2
(c) 3 : 5 (d) 5 : 3

52. A person covers a distance of 300 km and then returns to the starting point. The time taken by him for the outward journey is 5 hours more than the time taken for the return journey. If he returned at a speed of 10 km/h more than the speed of going, what was the speed (in km/h) for the outward journey?

किसी 300 km की दूरी को तय करने के बाद वापस आने के लिए उसने 5 घंटे अधिक समय ले लिया। यदि वह वापस आने की गति 10 km/h अधिक थी, तो उसने आगे की दूरी तय करने में क्या गति का उपयोग किया?

SSC CPO 24/11/2020 (Shift-1)

- (a) 30 (b) 15
(c) 25 (d) 20

53. A boy increases his speed to $\frac{9}{5}$ times of his original speed. By doing this, he reaches his school 40 minutes before the usual time. How much time (in minutes) does he take usually?

एक लड़का अपनी गति को $\frac{9}{5}$ गुना बढ़ा देता है। इससे वह अपने स्कूल में 40 मिनट पहले पहुंच जाता है। वह आमतौर पर कितने मिनटों में स्कूल जाता है?

SSC CPO 24/11/2020 (Shift-2)

- (a) 120 (b) 30
(c) 90 (d) 45

54. A takes 2 hours 30 minutes more than B to walk 40 km. If A doubles his speed, then he can make it in 1 hour less than B. What is the average time taken by A and B to walk a 40 km distance?

40 km की दूरी को तय करने में A को B से 2 घंटे 30 मिनट अधिक लगते हैं। यदि A अपनी गति दोगुना कर लेता है, तो वह B से 1 घंटे कम में इसी दूरी को तय कर लेता है। A और B द्वारा 40 km की दूरी को तय करने में औसत समय क्या होगा?

SSC CPO 25/11/2020 (Shift-1)

- (a) 5 hours 45 minutes
(b) 7 hours 15 minutes
(c) 5 hours 15 minutes
(d) 6 hours

55. A person has to travel a distance of 30 km. He finds that he has covered $\frac{5}{6}$ part of the distance in 3 hours and 20 minutes. What is his speed (in km/h)?

किसी 30 km की दूरी को तय करने के लिए एक व्यक्ति 3 घंटे 20 मिनट में $\frac{5}{6}$ हिस्सा तय कर चुका है। उसकी गति क्या होगी?

SSC CPO 09/12/2019 (Shift-01)

- (a) 6 (b) 54
(c) 6.3 (d) 7.5

56. A person travels a distance of 240 km partly by train and the rest by

bus. He takes $3\frac{1}{2}$ hours if he

travels 150 km by train and the rest by bus. If he travels 140 km by bus and the rest by train, he

takes $3\frac{2}{3}$ hours. What is the

speed of the train?

किसी 240 km की दूरी को तय करने के लिए एक व्यक्ति 3 घंटे 30 मिनट में 150 km ट्रेन से और बाकी बस से तय करता है। यदि वह 140 km बस से और बाकी ट्रेन से तय करता है, तो उसे

$3\frac{2}{3}$ घंटे लगते हैं। ट्रेन की गति क्या होगी?

किसी 240 km की दूरी को तय करने के लिए एक व्यक्ति 3 घंटे 30 मिनट में 150 km ट्रेन से और बाकी बस से तय करता है। यदि वह 140 km बस से और बाकी ट्रेन से तय करता है, तो उसे $3\frac{2}{3}$ घंटे लगते हैं। ट्रेन की गति क्या होगी?

SSC CPO 09/12/2019 (Shift-02)

- (a) 72 km/h
(b) 75 km/h
(c) 80 km/h
(d) 70 km/h

57. A and B started travelling towards each other at the same time from places X to Y and Y to X respectively. After crossing each other, A and B took 2.45 hours and 4.05 hours to reach Y and X respectively. If the speed of B was 8.4 km/h, then what was the speed (in km/h) of A?

A और B एक ही समय पर X से Y और Y से X की ओर चलने लगे। एक-दूसरे से मिलने के बाद, A और B 2.45 घंटे और 4.05 घंटे में Y और X तक पहुंचे। यदि B की गति 8.4 km/h थी, तो A की गति क्या होगी?

SSC CPO 11/12/2019 (Shift-01)

- (a) 10.8
(b) 9.9
(c) 12.6
(d) 11.7

58. A person takes 40 minutes more than his usual time when he covers a distance of 20 km at 5 km/h. If he covers the same distance at 8 km/h, he takes x minutes less than the usual time. What is the value of x?

किसी 20 km की दूरी को 5 km/h की गति से तय करने में एक व्यक्ति 40 मिनट अधिक समय लेता है। यदि वह 8 km/h की गति से इसी दूरी को तय करता है, तो उसे x मिनट कम समय लगता है। x का मान क्या होगा?

SSC CPO 11/12/2019 (Shift-02)

- (a) 48
(b) 54
(c) 45
(d) 50

SOLUTIONS

1. (b) Speed = $\frac{900}{6 \times 60} \times \frac{18}{5}$
= 9 km/hr
2. (a) Avg. speed = $\frac{2}{\frac{1}{30} + \frac{1}{45}}$
= $\frac{2 \times 15 \times 6}{3 + 2} = 36$ km/hr
3. (a) We know that if the distance is the same then,
Average speed = $\frac{2ab}{a+b}$
Avg. speed = $\frac{2 \times 36 \times 60}{36 + 60}$
= $\frac{2 \times 36 \times 60}{96} = 45$ km/hr
4. (a)

$\frac{10 \text{ km}}{2t_1} \quad \frac{10 \text{ km}}{t_1} \quad \frac{10 \text{ km}}{t_2} \quad \frac{10 \text{ km}}{2t_1}$

10 km

10 km

10 km

10 km

ATQ,

$$\frac{10}{2t_1} = 40 \Rightarrow t_1 = \frac{1}{8}$$

Avg. speed = $\frac{\text{total distance}}{\text{total time}}$

$$= \frac{40}{\frac{1}{4} + \frac{1}{8} + \frac{1}{8} + \frac{1}{4}} = \frac{40 \times 8}{2 + 1 + 1 + 2}$$

$$= \frac{40 \times 8}{6} = \frac{160}{3} \text{ km/hr.}$$
- 5. (d) Relative distance = 300 m
Relative speed = (13 - 11) = 2 km/hr
time after which he will catch the thief = $\frac{300}{2 \times 1000}$
= $\frac{3}{20}$ hrs.
Distance travelled by police
= $13 \times \frac{3}{20} = \frac{39}{20} = 1.95$ km
- 6. (b) Required distance = $\frac{28}{8} \times 6$
= 21 km

7. (b) Relative distance = 288 m
Relative speed = 12 m/min
time = $\frac{288}{12} = 24$ min
8. (b) Avg. speed = $\frac{\text{total distance}}{\text{total time}}$

$$73 = \frac{\left(\frac{3}{4} \times S_1\right) + \left(\frac{75}{60} \times 85\right) + (3 \times 70)}{5}$$

$$365 = \frac{3}{4} S_1 + \frac{5}{4} \times 85 + \frac{210 \times 4}{4}$$

$$1460 = 3S_1 + 425 + 840$$

$$\Rightarrow S_1 = \frac{195}{3} = 65 \text{ km/hr}$$
9. (a) Let, original speed be S km/hr
 $\therefore$ Normal time of train = $\frac{1000}{S}$
 and new speed = (S - 75)
 $\therefore$ Time of train when speed is reduced = $\frac{1000}{S - 75}$
 ATQ,

$$\frac{1000}{S - 75} - \frac{1000}{S} = 3$$

$$\Rightarrow 1000[S - S + 75] = 3(S - 75)S$$

$$\Rightarrow 75000 = 3S^2 - 225S$$

$$\Rightarrow 3S^2 - 225S - 75000 = 0$$

$$\Rightarrow S^2 - 75S - 25000 = 0$$

$$\Rightarrow S^2 - 200S + 125S - 25000 = 0$$

$$\Rightarrow S(S - 200) + 125(S - 200) = 0$$

$$\Rightarrow (S + 125)(S - 200) = 0$$

$$\Rightarrow S = 200 \text{ km/hr}$$

Original time = $\frac{1000}{S} = \frac{1000}{200}$
= 5 hrs

- 10. (c) Avg. speed = $\frac{\text{total distance}}{\text{total time}}$

$$= \frac{540 + (90 \times 5)}{\frac{240}{60} + 5}$$

$$= \frac{990}{9} = 110 \text{ km/hr}$$
- 11. (b) If distance is same then,
speed $\propto \frac{1}{\text{Time}}$

- | | | | |
|---------------|----------------|----------------|----------------|
| | A | B | C |
| Time | 12 | 15 | 10 |
| Speed | $\frac{1}{12}$ | $\frac{1}{15}$ | $\frac{1}{10}$ |
| $\Rightarrow$ | 5 | 4 | 6 |
12. (d) Remaining distance = $\frac{88}{2}$
= 44 km
Remaining time = $\frac{1}{4} \times 16 = 4$ hrs
 $\therefore$ Required speed = $\frac{44}{4}$
= 11 km/hr
 13. (b)

	Old	New
Speed	4	1
Time	1	4
		+3

ATQ,
3 unit $\rightarrow$ 45 min
Usual time (1 unit) = 15 min

 - 14. (c)
Avg. speed = $\frac{2ab}{a+b} = \frac{2 \times 30 \times 70}{30 + 70}$
= 42 km/hr
 - 15. (b) Relative speed = 12 - 10 = 2 kmph.
Distance travelled by thief in 30 minutes
= $10 \times \frac{1}{2} = 5$ km.
Time after which police would catch thief = $\frac{5}{2} = 2.5$ hrs.
ie, at 7 : 30 + 30 min + 2.5 hrs
 $\Rightarrow$ at 10:30 pm
 - 16. (a) $\xleftarrow{S} \quad \xrightarrow{J}$
 ATQ,
 $D_s + D_j = 40$ kms
 Let, speed of soma = S
 $\therefore$ Speed of Julie = S + 4
 Then,
 $S \times 4 + 4(S + 4) = 40$
 $\Rightarrow S + S + 4 = 10$
 $\Rightarrow S = 3$ km/hr
 Speed of julie = 7 km/hr

17. (d) Speed = $\left(\frac{750}{54} \times \frac{18}{5}\right)$ km/hr
= 50 km/hr
18. (b) Let Speed of slow local = S_1
 $\therefore$ Speed of faster local = $S_1 + 10$ ATQ,
$$\frac{150}{S_1} - \frac{150}{S_1 + 10} = \frac{45}{60}$$

$$150(S_1 + 10 - S_1) = \frac{45}{60}(S_1^2 + 10S_1)$$

$$= \frac{1500 \times 60}{45} = S_1^2 + 10S_1$$

$$\Rightarrow S_1^2 + 10S_1 - 2000 = 0$$

$$\Rightarrow S_1^2 - 40S_1 + 50S_1 - 2000 = 0$$

$$\Rightarrow S_1(S_1 - 40) + 50(S_1 - 40) = 0$$

$$\Rightarrow S_1 = 40 \text{ km/hr.}$$
19. (a)
 $25\% = \frac{1}{4}, 50\% = \frac{1}{2}, 12.5\% = \frac{1}{8}$
Let, total distance be 400 km
Avg. speed = $\frac{\text{total distance}}{\text{total time}}$
$$= \frac{400}{\frac{100}{25} + \frac{200}{50} + \frac{100}{12.5}}$$

$$= \frac{400}{4 + 4 + 8} = 25 \text{ km/hr}$$
20. (d)

	Reema	Rekha
Speed	5	4

Relative distance = 50 mtr.
relative speed = 1 m/sec.
time = 50 sec
 $\therefore$ they will meet after a distance of $50 \times 5 = 250$ mtr. from starting
21. (d) Distance covered by Rajesh in 36 sec
$$= \frac{1200}{40} \times 36 = 1080 \text{ mtr.}$$

 $\therefore$ Rakesh beat Rajesh by $1200 - 1080 = 120$ mtr.
22. (b) Given that, the bus is 30 km ahead of car and after 3 hour the car is ahead of 60km
Speed of bus = 42 km/h
Let the speed of car = x km/h
Speed = $\frac{\text{Distance}}{\text{Time Taken}}$
$$\Rightarrow x - 42 = \frac{90}{3}$$

$$\Rightarrow x = 30 + 42 = 72 \text{ km/h}$$

23. (a) Distance covered by the car = $54 \times 3 = 162$ km
After the increment speed of car by 27 km/hr.
= $(54 + 27) = 81$ km/h
Time taken = $\frac{162 \text{ km}}{81 \text{ km/hr}} = 2$ hour
24. (a) Time taken in way A
$$= \frac{114}{38} = 3$$
 hour
Time taken in way B
$$= \frac{84}{42} = 2$$
 hour
Time taken in way C
$$= \frac{230}{46} = 5$$
 hour
Total time taken = $(3 + 2 + 5) = 10$ hour
Total Distance Covered = $(114 + 84 + 230) = 428$ km
Average speed = $\frac{428}{10} = 42.8$ km/h
25. (c) Relative Speed = $(6 + 4) = 10$ km/h
Time = 4 h
Distance = Speed $\times$ Time
= $10 \times 4 = 40$ km
26. (a) Average Speed = $\frac{2 \times S_1 \times S_2}{(S_1 + S_2)}$
$$= \frac{2 \times 12 \times 18}{(12 + 18)} = 14\frac{2}{5} \text{ km/h}$$
27. (c) Given,
Car covers 75.5 km in 3.5 litre of petrol
 $\therefore$ Car will cover the distance in 28 litre petrol
$$= \frac{75.5}{3.5} \times 28 = 604 \text{ km}$$
28. (b) Case I
Speed = 21 m/s
Time = 10 m = 600 s
Distance = Speed $\times$ Time
= $21 \times 600 = 12600 = 12.6$ km
Hence, Total Distance Covered = $12.6 + 9 + 10 = 31.6$ km
Total Time Taken
$$= 10 + 10 + 10 = 30 \times \frac{1}{60} \text{ h} = 0.5 \text{ h}$$

Average Speed = $\frac{31.6 \text{ km}}{0.5 \text{ h}}$
= 63.2 km/h

29. (a)
Average speed = $\frac{\text{Total Distance}}{\text{Total Time}}$
$$= \frac{100 + 140}{\frac{100}{50} + \frac{140}{70}} = 60 \text{ km/h}$$
30. (b) Given,
 $S_1 : S_2 = 2 : 3$
If D is constant then T is Inversely proportional to the S.
 $T_1 : T_2 = 3 : 2$
1 unit = 10 s
 $T_1 = 30$ s and $T_2 = 20$ s
$$S_2 - S_1 = \frac{50}{20} - \frac{50}{30}$$

$$= 50 \left(\frac{3 - 2}{60} \right) = \frac{5}{6} \text{ m/s}$$
31. (d) Average Speed = $\frac{2 \times 60 \times 40}{60 + 40}$
= 48 km/h
32. (a)

Lap	Distance	Time	Speed
First	200 km	4 h	50 km/h
Second	162 km	$\frac{D}{S} = \frac{162}{15} \times \frac{5}{18} = 3 \text{ h}$	15 m/s
Third	—	4 h	—

Total distance
= $50 \times 11 = 550$ km
Remaining distance for third lap
= $550 - 362 = 188$ km
Speed of car in third lap
$$= \frac{188}{4} = 47 \text{ km/h}$$
33. (c) Distance from Initial Position
$$= \sqrt{24^2 + 10^2}$$

$$= \sqrt{576 + 100} = \sqrt{676} = 26 \text{ m}$$
34. (b)

Speed	Time	Distance
100 km/h	$\frac{1}{2} \text{ h}$	50 km
80 km/h	$\frac{240}{80} = 3 \text{ h}$	Remaining distance = $290 - 50$ = 240 km

Total time = $0.5 + 3 = 3.5$ hours
35. (a)
If distance is constant, time is inversely proportional to speed.

Given $s_A : s_B = 3 : 5$
 $t_A : t_B = 5 : 3$
 Time difference, $t_A - t_B = 30$ minutes
 $\Rightarrow 2 \text{ units} = 30 \text{ minutes}$
 $\Rightarrow 1 \text{ unit} = 15 \text{ minutes}$
 Hence, Time taken by A, t_A
 $= 5 \times 15 \text{ minutes}$
 $= 75 \text{ minutes} = 1 \text{ hour } 15 \text{ minutes}$

36. (a) Average speed = $\frac{\text{Total Distance}}{\text{Time Taken}}$

$$= \frac{120}{\frac{60}{60} + \frac{30}{60} + \frac{30}{60}} = 48 \text{ km/h}$$

37. (a) Distance covered by first car in 1 hour = 50 km.
 Now, relative speed
 $= (75 - 50) \text{ km/h} = 25 \text{ km/h}$
 Time taken by second car to cover 50 km

$$= \frac{50}{25} = 2 \text{ hours}$$

Hence, they will meet at 06:00 pm.

38. (b) Concept,
 Speed $\times$ Time = Distance

$$1 \text{ km/hr} = \frac{5}{18} \text{ m/s}$$

Given that, Speed of police = 12 km/h and speed of Thief = 10 km/h.
 Thief is spotted by police at a distance of 250 m.

Relative speed
 $= (12 - 10) \text{ km/h} = 2 \text{ km/hr}$
 Time taken by the police to caught

$$\text{the thief} = \frac{250}{2} \times \frac{18}{5} = 450 \text{ seconds}$$

Distance covered by the thief before he is caught

$$= 10 \times \frac{5}{18} \times 450$$

$$= 1250 \text{ m} = 1.25 \text{ km}$$



SMART APPROACH:-

The ratio of speed of police and thief is $= 6 : 5$
 Then the ratio of distance $= 6 : 5$
 1 unit = 250 m
 5 units = 1250 m = 1.25 km

39. (c) Speed of policeman = 7 m/s
 Speed of thief = 5 m/s
 Relative speed = $(7 - 5) \text{ m/s} = 2 \text{ m/s}$
 Distance = 150 m

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}} = \frac{150}{2} = 75 \text{ s}$$

The distance covered by the thief when he is caught by the policeman,
 $= \text{Speed of thief} \times \text{time}$
 $= 5 \text{ m/s} \times 75 \text{ s} = 375 \text{ m}$



SMART APPROACH:-

The ratio of speed of thief and police $= 5 : 7$
 Then, the ratio of distance $= 5 : 7$
 $(7 - 5)x = 2x = 150$
 $x = 75 \text{ m}$
 $\therefore 5x = 5 \times 75 = 375 \text{ m}$

40. (c) Relative Speed $= (8 - 7) = 1 \text{ km/h}$
 Distance Run by the thief

$$= 7 \text{ km/h} \times \frac{120}{1} = 840 \text{ m}$$



SMART APPROACH:-

The ratio of speed of thief and police $= 7 : 8$
 ratio of distance $= 7 : 8$
 $(8 - 7)x = x = 120 \text{ m}$
 $7x = 840 \text{ m}$

41. (a) Total length of the race is 12 km = 12000 m
 Track Length = 1200 m
 Number of round to complete the

$$\text{race} = \frac{12000}{1200} = 10$$

The race will be finished by A in
 $= 300 \times 10 = 3000 \text{ seconds}$

Now, When both of them start the running

A and B will meet the first time
 $= \text{LCM}(300, 400)$

$$= 1200 \text{ seconds}$$

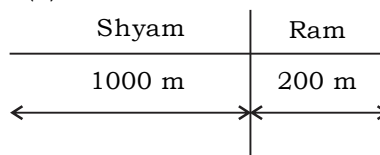
A and B will meet the second time
 $= 2400 \text{ seconds}$

For next meet,

Time would be 3600 seconds, which is not possible as A complete the race in 3000 seconds.

Hence, Both of them will meet last time at 2400 seconds.

42. (b)



Given, Length of Race = 1200 m
 Ram can beat Shyam by 200 m or 20 sec, it means Shyam is covering 1000 m in the race and if he has given 20 sec he will finish the race.

$$\text{Speed of Shyam} = \frac{200}{20} = 10 \text{ m/s}$$

The ratio of distance covered by Ram and Shyam

$$= 1200 : 1000 = 6 : 5$$

Here, Time is constant

If time is constant, speed is directly proportional to distance.

The ratio of speed of Ram and Shyam $= 6 : 5$

Hence, Speed of Ram

$$= \frac{10}{5} \times 6 = 12 \text{ m/s}$$



SMART APPROACH:-

$$\text{Speed of Shyam} = \frac{200}{20} = 10 \text{ m/s}$$

Time is constant

Ratio of Ram and Shyam = ratio of their speed distance

$$\text{Ratio of speed} = 6 : 5$$

$$5x = 10 \text{ m/s}$$

$$6x = 12 \text{ m/s}$$

43. (b) Given

Distance = 1500 m

Speed of B = 6 m/s

Time taken by B to complete the race

$$= \frac{1500}{6} = 250 \text{ sec}$$

Time taken by A to complete the race

$$= 250 - 10 = 240 \text{ sec}$$

We know, 60 sec = 1 min

$$\therefore 240 \text{ sec} = 4 \text{ min}$$

A will take 4 minutes to complete the race.

44. (c) If d is constant,

$$\Rightarrow \frac{S_A}{S_B} = \frac{t_B}{t_A} = \frac{30}{25} = \frac{6}{5}$$

If T is constant

$$\Rightarrow \frac{d_A}{d_B} = \frac{S_A}{S_B} = \frac{6}{5}$$

To end race at dead-heat in 1 km race A has to give start of B

$$= \frac{1}{6} \times 1000 \text{ m} = 166.67 \text{ m}$$

45. (a) Given,

Ratio of speed of Geeta and Babita $= 5 : 2$

If time is constant then distance is directly proportional to the speed

Hence, the ratio of distance covered by Geeta and Babita = 5 : 2
Given,
Lead distance = 5 - 2 = 3 units
3 units = 40 m

$$5 \text{ units} = \frac{40}{3} \times 5 = 66.67 \text{ m}$$

46. (b) Time taken by P to cover the track

$$= \frac{36}{3} = 12 \text{ hour}$$

Time taken by Q to cover the track

$$= \frac{36}{4} = 9 \text{ hour}$$

Time taken by R to cover the track

$$= \frac{36}{6} = 6 \text{ hour}$$

LCM of 12, 9 and 6 = 36 hour

47. (a) $20\% = \frac{-1}{5}$

If distance is constant, speed is inversely proportional to time.

$$t_1 : t_2 = 5 : 4$$

$$s_1 : s_2 = 4 : 5$$

$$\text{Net increment} = \frac{1}{4} \times 100\% = 25\%$$

48. (a) $\therefore$ Distance same

$$\text{So, Speed} \propto \frac{1}{\text{Time}}$$

$$(A) \text{ speed } 1 : 2$$

$$\text{Time } 2 : 1$$

$$x = 2 + \frac{1}{2} + 1$$

$$x = \frac{7}{2}$$

$$\text{So, } 2x = \frac{7}{2} \times 2 = 7 \text{ hours}$$

A require 7 hours for walking 40 km

49. (a) $\frac{300}{n} - \frac{300}{n+10} = 5$

By Hit and Trial,

$$n = 20 \text{ km/h}$$

$$n + 10 = 30 \text{ km/h}$$

$$\text{Average speed} = \frac{2 \times 30 \times 20}{30 + 20}$$

$$= 24 \text{ km/h}$$

50. (d) Distance constant

$$\text{So, Speed} \propto \frac{1}{\text{Time}}$$

$$T \rightarrow 75 : 45$$

$$S \rightarrow 3 : 5$$

51. (a) Speed of Bus = $\frac{60}{1 + \frac{1}{2}}$

$$= 40 \text{ km/h}$$

$$\text{Speed of Car} = \frac{60}{\frac{3}{4}} = 80 \text{ km/h}$$

$$\text{Ratio} = 80 : 40$$

$$= 2 : 1$$



SMART APPROACH:-

Here, distance is constant

$$T = 90 : 45 = 2 : 1$$

$$\text{Speed} = 1 : 2$$

$$\text{Hence, Required ratio} = 2 : 1$$

52. (d) $\frac{300}{n} - \frac{300}{n+10} = 5$

By hit and trial

$$n = 20 \text{ km/h}$$

Speed for onward journey = 20 km/h

53. (c) Distance same

$$\text{Speed} \propto \frac{1}{\text{Time}}$$

$$\text{Speed} - 5 \rightarrow 9$$

$$\text{Time} - 9 \rightarrow 5$$

$$(4) = 40 \text{ minutes}$$

Usual time (9) = 90 minutes

54. (a) Distance same

$$\text{Speed } 1 : 2$$

$$\text{Time } 2 : 1$$

$$x = \left(2 + \frac{1}{2}\right) + 1$$

$$x = \frac{7}{2}$$

A takes time to cover 40 km

$$= 2x = 7 \text{ hours}$$

B takes time to cover 40 km = 4 hours 30 minutes

Total time taken by (A + B)

$$= \left(7 + 4\frac{1}{2}\right) \text{ hours}$$

$$\text{Average} = \frac{23}{2 \times 2} = 5 \text{ hours } 45 \text{ min.}$$

55. (d) Person has to travel a distance = 30 km

He has covered $\frac{5}{6}$ part of the distance in 3h 20 min

$$= 30 \times \frac{5}{6} = 25 \text{ km}$$

$$\text{Speed} = \frac{D}{T} = \frac{25 \times 3}{10} = \frac{15}{2} = 7.5 \text{ km/h}$$

56. (b) $\frac{7}{2} = \frac{150}{x} + \frac{90}{y} = 7xy$

$$= 300y + 180x \quad \dots\dots(i)$$

$$\frac{11}{3} = \frac{100}{x} + \frac{140}{y}$$

$$= 11xy = 300y + 420x \quad \dots\dots(ii)$$

$$7xy = 300y + 180x$$

$$11xy = 300y + 420x$$

$$4xy = 240x$$

$$y = 60 \text{ (Speed of bus)}$$

$$\text{Speed of train} = \frac{7}{2} = \frac{150}{x} + \frac{90}{60}$$

$$x = 75 \text{ (speed of train)}$$



SMART APPROACH:-

Train	Car	
150	90	3h 30 min
100	140	3 h 40 min
0	240	4 h

$$\therefore \text{Speed of car} = \frac{240}{4} = 60 \text{ km/h}$$

$$\text{Speed of train} = \frac{150}{2} = 75 \text{ km/h}$$

57. (a) We know that,

$$\frac{S_A}{S_B} = \sqrt{\frac{T_B}{T_A}}$$

$$\frac{S_A}{8.4} = \sqrt{\frac{4.05}{2.45}}$$

$$\frac{S_A}{8.4} = \frac{9}{7}$$

$$S_A = 10.8 \text{ km/h.}$$

58. (d) $T = \frac{D}{S} = \frac{20}{5} = 4 \text{ h}$

Usual time = 4 h - 30 min = 3h 20 min

Speed of man = 8 km/h

$$T = \frac{20}{8} = 2 \text{ h } 30 \text{ min}$$

$$\text{Time difference} = (3\text{h} + 20 \text{ min}) - (2\text{h} + 30 \text{ min}) = 50 \text{ min}$$

Method:-2

$$\Rightarrow \frac{D}{S} \rightarrow \frac{5 \times 8}{8-5} \times \frac{(40+x)}{60} = 20$$

$$\Rightarrow \frac{40}{3} \times \frac{(40+x)}{60} = 20$$

$$\Rightarrow 80 + 2x = 180$$

$$\Rightarrow x = 50 \text{ min}$$

59. (d) Distance = $50 \times 8 = 400 \text{ km}$
New speed of Ranjeet = 60 km/h

$$\text{Speed of Rehman} = \frac{400}{5} = 80 \text{ km/h}$$

$$\text{New Speed of Rahman} = 100 \text{ km/h}$$

$$\text{Time Difference} = \frac{400}{60} - \frac{400}{100}$$

$$= \frac{20}{3} - \frac{4}{1} = \frac{8}{3} = 2 \text{ h } 40 \text{ min}$$

60. (b) ATQ,

$$\frac{6 \times (x-12)}{60} = 4 \times \frac{(x+10)}{60}$$

$$\Rightarrow 3x - 36 = 2x + 20$$

$$\Rightarrow x = 56 \text{ min}$$

$$\text{Speed of the man} = \frac{6(56-12)}{60 \times \frac{56}{60}}$$

$$= \frac{6 \times 44}{56} = \frac{33}{7} = 4 \frac{5}{7} \text{ km/h}$$

61. (b) Let the distance between station A and station B is = $D \text{ km}$.

A.T.Q,

$$\frac{d}{30} + \frac{d}{40} = \frac{63}{10}$$

$$\Rightarrow \frac{7d}{120} = \frac{63}{10}$$

$$\Rightarrow d = 108 \text{ km}$$


SMART APPROACH:-

$$\text{Distance} = \frac{S_1 \times S_2}{S_1 + S_2} \times \text{total time}$$

$$= \frac{30 \times 40}{70} \times 6.3 = 108 \text{ km}$$





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TRAIN

प्रतिस्पर्धा

12

1. Train 'A' requires 15 seconds to cross train 'B' of length 300 m moving in the opposite direction at a speed of 36 km/h. Further, train 'A' requires 30 seconds to cross a 500 m long stationary train 'C'. Find the length (in m) of train 'A'.

क्रि 'A' श 36 km/h शहराज नसंख्यै ह
प्रा तस्तरजै 300 m जर्वादिखजह
क्रि B शसयौ शैसतखे ब नसब श
नत् ज211 हू निशसजजाखम क्रि 'A'
शसबल तर्तै जर्वह 15 0% क्रि 'C'
शसयौ शैसतखे ल नसब श नत्
ज211 हू क्रि 'A' शह जर्वादिखम तस्
आ शै ह

SSC CPO 03/10/2023 (Shift-02)

- (a) 275 (b) 200
(c) 250 (d) 300

2. Two trains of lengths 200 m and 250 m are running on parallel rail tracks at speeds of 68 km/h and 50 km/h, respectively. In how much time (in seconds) will they cross each other if they are running in the same direction?

नल्लम जौ नल्लम जर्वह पासक्रिसनती लै
स यै सयै प्रत 17 25 km/h जौ
बल km/h शहराज नसरजै 68 हू. प
खस 17 50 प्रत तस्तरजै 68 हू. सख
17 पवै सशसं शीसनत् तस्तरजै
तस् यौ शै ह

SSC CPO 04/10/2023 (Shift-02)

- (a) 90 (b) 80
(c) 75 (d) 85

3. A goods train 350 m long passes through a tunnel of 1250m in 80 seconds. What is the speed of the train?

बल तर्तै जर्वह 17 ताज212खे नल्ल तर्तै
जर्वह नैख नसएल नसब तस्2है। ह हू क्रि
शह2। 1 हू

SSC CPO 04/10/2023 (Shift-3)

- (a) 78 km/h (b) 72 km/h
(c) 56 km/h (d) 64 km/h

4. Two trains Mumbai Rajdhani and Kissan Express of lengths 850 m and 700 m are 1050 m apart, and are running on parallel tracks towards each other. Mumbai Rajdhani is running at 62 km/h and Kissan Express is running at 55 km/h. In how much time (in sec) will the trains cross each other?

एबल तर्तै जौ गल्ल तर्तै जर्वह पासक्रि212दचास
न तर्तै 1 (क्षीह जौ शनी 1) नखस 17
पवै सनसे लल्लतर्तै पेट हू जौ 17 पवै स
शह जौस नतीलै यै सयै रजै 62
हू तर्तै 1 (क्षीह 55 शतखसि शहै 311
नसरजै 62 हू जौ शनी 1) नखस बल
शतखसि शहै 311 नसरजै 62 हू शीस
नत् ज्ञनसब तस् तस् 212दचास 17 पवै स
शसयौ शै ह

SSC CPO 05/10/2023 (Shift-01)

- (a) 80 (b) 70
(c) 75 (d) 45

5. A train of length 180 m takes 40 seconds to cross a tunnel of length 500 m. What is the speed of the train, in km/h?

एल तर्तै जर्वह 17 क्रि बल तर्तै जर्वह
नैख शसयौ शैसतखे ल नसब जसह हू
क्रि शह2। शतखसि तस् 1 हू

SSC CPO 05/10/2023 (Shift-2)

- (a) 80.5 (b) 52.5
(c) 61.2 (d) 71.2

6. Two trains A and B having the length 195 m and 165 m respectively, are running in the same direction on parallel lines. If the speed of A and B be 77 km/h and 85 km/h respectively, then what will be the time (in seconds) taken by them to cross each other?

पासक्रि A जौ B (शह जर्वादिप्रत 17
ब तह जौ ? ब तह हूमनती लै यै सयै
यै 17 77 प्रत तस्तरजै 85 हू. प A
जौ B शहराज प्रत 17 गग शतखसि
जौ एब शतखसि हूम। स 17 सधौ 17
पवै सशसयौ शैसतखे शी नत् ज्ञनसब
तस् ज 1 (11212)

SSC CPO 09/11/2022 (Shift-01)

- (a) 162 (b) 164
(c) 160 (d) 166

7. Two trains start from Delhi and Puna towards each other at 7 am with speeds of 85 km/h and 67 km/h, respectively. If they cross each other at 3.30 p.m., the distance between the stations is: पासक्रिसयण 7:00 (सं परजह जौ यै।
नसप्रत 17 एब शतखसि जौ गग शतखसि
शहराज नस 17 पवै सशह जौस रजी।
योबा शै। ह हू. प खसपासि 17 पवै स
शसना 3:30 (सयौ शै। ह हू. सपासि
0सी सशसं ह शह पैवह हू

SSC CPO 09/11/2022 (Shift-02)

- (a) 1245 km (b) 1292 km
(c) 1283 km (d) 1227 km

8. Two trains A and B start running at 80 km/h and 82 km/h towards each other from two different stations. They meet after 1 hour 30 minutes. How far were they from each other when they started?

पासक्रि 212दचाव A जौ B पासक्रि 212ज
0सी सनसा श पवै सशह जौस एल शतखसि
जौ ए शतखसि शहराज नसरजी। ह
शै। ह हू खसे शसि लती शीसप तज। ह
हू (स 212दचासी सरजी। ह श. 1। स
खस 17 पवै सनसं शीह पैवह यै श

SSC CPO 09/11/2022 (Shift-03)

- (a) 19 km (b) 262 km
(c) 243 km (d) 224 km

9. Two stations are 120 km apart on a straight line. A train starts from station A at 8 a.m. and moves towards station B at 20 km/h and another train starts from station B at 9 a.m. and travels towards station A at a speed of 30 km/h. At what time will they meet?

पास0सी 17 नखहै सा तस् नल शतह
शह पैवह यै हू 17 क्रि 0सी A नसरनउ
8 (सयै रजी। ह शै। ह हू जौ 0सी
B शह जौस नल शतखसि शहराज नस
रज। ह हू जौ पवै ह क्रि 0सी B नसरनउ
9 (सयै रजी। ह शै। ह हू जौ 0सी
A शह जौस 30 शतखसि शहराज नस
रज। ह हू खसंश नत् तज

SSC CPO 10/11/2022 (Shift-01)

- (a) 10:30 am (b) 10:00 am
(c) 11:00 am (d) 11:30 am
10. Two trains running between Bangalore and Chennai, start at the same time from their respective locations and proceed towards each other at the speed of 80 km/h and 95 km/h. When they meet, it is found that one train has travelled 180 km more than the other. The distance between Bangalore and Chennai is ____.

दो ट्रेने बैंगलूर और चेन्नई के बीच एक ही समय से एक-दूसरे की ओर चल रही हैं। एक ट्रेन 80 किमी/घंटा की गति से चल रही है और दूसरी 95 किमी/घंटा की गति से। वे मिलते हैं और पता चलता है कि एक ट्रेन दूसरी से 180 किमी अधिक दूरी तय कर चुकी है। बैंगलूर और चेन्नई के बीच की दूरी क्या है?

SSC CPO 10/11/2022 (Shift-01)

- (a) 1200 km (b) 2100 km
(c) 345 km (d) 400 km
11. Two trains 121 m and 99 m in length respectively are running in opposite directions, one at a speed of 40 km/h and the other at a speed of 32 km/h. In what time will they be completely clear of each other from the moment they meet?

दो ट्रेने 121 मीटर और 99 मीटर की लंबाई के साथ एक-दूसरे की ओर चल रही हैं। एक ट्रेन 40 किमी/घंटा की गति से चल रही है और दूसरी 32 किमी/घंटा की गति से। वे मिलते हैं और पूरी तरह से एक-दूसरे से अलग हो जाने में कितना समय लगेगा?

SSC CPO 10/11/2022 (Shift-03)

- (a) 11 sec (b) 12 sec
(c) 13 sec (d) 10 sec
12. Two trains with a speed of 80 km/h and 120 km/h, respectively, are 500 km apart each other. Find the distance between them 10 minutes before crossing.

दो ट्रेने 80 किमी/घंटा और 120 किमी/घंटा की गति से एक-दूसरे से 500 किमी दूर हैं। वे मिलने से 10 मिनट पहले की दूरी क्या होगी?

SSC CPO 11/11/2022 (Shift-01)

- (a) 72.33 km (b) 33.33 km
(c) 63.33 km (d) 52.74 km

13. A train crosses two persons travelling at 4 km/h and 6 km/h in the same direction in 12 sec and 14 sec, respectively. The speed of the train is

एक ट्रेन दो व्यक्तियों को एक ही दिशा में 4 किमी/घंटा और 6 किमी/घंटा की गति से क्रमशः 12 सेकंड और 14 सेकंड में पार करती है। ट्रेन की गति क्या है?

SSC CPO 11/11/2022 (Shift-03)

- (a) 18 km/h (b) 26 km/h
(c) 20 km/h (d) 24 km/h
14. A train x running at 74 km/h crosses another train y running at 52 km/h in the opposite direction in 12 seconds. If the length of y is two-thirds that of x, then what is the length of x (in m)?

ट्रेन x 74 किमी/घंटा की गति से चल रही है और ट्रेन y 52 किमी/घंटा की गति से। ट्रेन y की लंबाई ट्रेन x की लंबाई का दो-तीरा है। ट्रेन x की लंबाई क्या है (मीटर में)?

SSC CPO 23/11/2020 (Shift-1)

- (a) 168 (b) 252
(c) 210 (d) 200
15. A train travelling at the speed of x km/h crossed a 300 m long platform in 30 seconds, and overtake a man walking in the same direction at 6 km/h in 20 seconds. What is the value of x?

एक ट्रेन x किमी/घंटा की गति से चल रही है जो 300 मीटर लंबाई का प्लेटफॉर्म 30 सेकंड में पार करती है और एक 6 किमी/घंटा की गति से चल रहे व्यक्ति को 20 सेकंड में पार करती है। x का मान क्या है?

SSC CPO 24/11/2020 (Shift-2)

- (a) 60 (b) 96
(c) 48 (d) 102
16. A train x running at 74 km/h crosses another train y running at 52 km/h in the opposite direction in 12 seconds. If the length of y is two-thirds that of x, then what is the length of y (in m)?

ट्रेन x 74 किमी/घंटा की गति से चल रही है और ट्रेन y 52 किमी/घंटा की गति से। ट्रेन y की लंबाई ट्रेन x की लंबाई का दो-तीरा है। ट्रेन y की लंबाई क्या है (मीटर में)?

SSC CPO 25/11/2020 (Shift-1)

- (a) 252 (b) 200
(c) 168 (d) 210
17. A train covers 400 km at a uniform speed. If the speed had been 10 km/h more, it would have taken 2 hours less for the same journey. What is the usual time taken (in hours) by it to complete the journey?

एक ट्रेन 400 किमी की दूरी एक समान गति से तय करती है। यदि गति 10 किमी/घंटा अधिक होती, तो उसी यात्रा के लिए 2 घंटे कम समय लगता। इस यात्रा के लिए आमतौर पर कितना समय (घंटों में) लगता है?

SSC CPO 25/11/2020 (Shift-2)

- (a) 12 (b) 15
(c) 8 (d) 10
18. The speed of two railway engines is in the ratio 5 : 4. If they move on parallel tracks in the same direction and if the slower engine is ahead of the faster engine by 8 km when the latter starts, then how far will the faster engine have to travel before it overtakes the slower one?

दो रेलवे इंजनों की गति का अनुपात 5 : 4 है। यदि वे समान दिशा में चल रहे हैं और धीरे-धीरे चलने वाला इंजन तेज चलने वाले इंजन से 8 किमी आगे है जब तेज चलने वाला इंजन शुरू होता है, तो तेज चलने वाले इंजन को कितना दूरी तय करनी होगी ताकि वह धीरे-धीरे चलने वाले इंजन को पार कर सके?

SSC CPO 09/12/2019 (Shift - 01)

- (a) 32 km (b) 48 km
(c) 40 km (d) 36 km
19. Two trains running in opposite direction on parallel tracks, at speeds of 42 km/h and 57 km/h take 18 seconds to cross each other. If the length of one train is 270 m, then the length of the other train is:

दो ट्रेने एक-दूसरे की ओर चल रही हैं, एक 42 किमी/घंटा की गति से और दूसरी 57 किमी/घंटा की गति से। वे 18 सेकंड में एक-दूसरे को पार करती हैं। यदि एक ट्रेन की लंबाई 270 मीटर है, तो दूसरी ट्रेन की लंबाई क्या होगी?

SSC CPO 09/12/2019 (Shift - 02)

- (a) 242 m (b) 225 m
(c) 250 m (d) 230 m

20. A train of length 212 m is running at 45 km/h. In what time (in seconds) will it cross a platform of length 188 m?

20. एक ट्रेन की लंबाई 212 मीटर है जो 45 किमी/घंटा की गति से चल रही है। इस ट्रेन को 188 मीटर लंबाई का प्लेटफॉर्म पार करने में कितना समय लगेगा?

SSC CPO 11/12/2019 (Shift - 01)

- (a) 36 (b) 42
(c) 32 (d) 40

21. The speed of train A is 16 km/h less than the speed of train B. To cover a distance of 384 km, B takes 4 hours less time than A. What is the speed (in km/h) of train B?

21. ट्रेन A की गति ट्रेन B की गति से 16 किमी/घंटा कम है। 384 किमी की दूरी तय करने में ट्रेन B ट्रेन A से 4 घंटे कम समय लेती है। ट्रेन B की गति (किमी/घंटा) क्या है?

SSC CPO 12/12/2019 (Shift - 01)

- (a) 50
(b) 48
(c) 45
(d) 32

22. The speed of a train is $2\frac{1}{6}$ times the speed of a car. The car covers 486 km in 9 hours. How much distance will the train cover in 6 hours?

22. एक ट्रेन की गति एक कार की गति से $2\frac{1}{6}$ गुना है। कार 486 किमी की दूरी 9 घंटों में तय करती है। ट्रेन 6 घंटों में कितनी दूरी तय करेगी?

SSC CPO 12/12/2019 (Shift - 02)

- (a) 612 km (b) 702 km
(c) 732 km (d) 712 km

23. A train of length 342 m is running at 54 km/h. In how much time (in seconds) will it cross a bridge of length 438 m?

23. एक ट्रेन की लंबाई 342 मीटर है जो 54 किमी/घंटा की गति से चल रही है। इस ट्रेन को 438 मीटर लंबाई का पुल पार करने में कितना समय लगेगा?

SSC CPO 13/12/2019 (Shift - 01)

- (a) 48 (b) 50
(c) 54 (d) 52

ANSWER KEY

1.(b)	2.(a)	3.(b)	4.(a)	5.(c)	6.(a)	7.(b)	8.(c)	9.(c)	10.(b)
11.(a)	12.(b)	13.(a)	14.(b)	15.(b)	16.(c)	17.(d)	18.(c)	19.(b)	20.(c)
21.(b)	22.(b)	23.(d)							

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SOLUTIONS

1. (b) Let, length of train A = L_A
Time taken by train A = 30 sec.
length of train C = 500 m.
So speed of train A (S_A)

$$= \frac{L_A + 500}{30}$$

Speed of train B = 36 km/hr

$$= 36 \times \frac{5}{18} = 10 \text{ m/sec.}$$

Time = 15 second
length = 300 meter

$$(S_A + 10) = \frac{L_A + 300}{15}$$

ATQ,

$$(L_A + 300) = \left(\frac{L_A + 500}{30} + 10 \right) \times 15$$

$$\Rightarrow L_A + 300 = \frac{L_A + 500 + 300}{30} \times 15$$

$$\Rightarrow 2L_A + 600 = L_A + 800$$

$$\therefore L_A = 200 \text{ m}$$

2. (a) $L_A = 200$, $L_B = 250$

$$S_A = 68, S_B = 50$$

ATQ,

Relative speed when travelling in same direction = $(68 - 50) \text{ km/h}$

$$= 18 \text{ km/h} = 18 \times \frac{5}{18} \text{ m/s} = 5 \text{ m/s}$$

$$\text{Required time} = \frac{(200 + 250)}{5}$$

$$= 90 \text{ sec.}$$

3. (b) Speed of train = $\frac{350 + 1250}{80}$

$$= \frac{1600}{80} = 20 \text{ m/s}$$

$$= 20 \times \frac{18}{5} = 72 \text{ km/hr}$$

4. (a) $L_m = 850 \text{ m}$, $L_k = 700 \text{ m}$
 $S_m = 62 \text{ km/hr}$, $S_k = 55 \text{ km/hr}$
Required time =

$$\frac{(850 + 700 + 1050) \times 18}{(62 + 55) \times 5}$$

$$= \frac{2600 \times 18}{117 \times 5} = 80 \text{ sec.}$$

5. (c)

$$\text{Speed of train} = \left(\frac{180 + 500}{40} \right) \times \frac{18}{5}$$

$$= \frac{680}{40} \times \frac{18}{5}$$

$$= \frac{17 \times 18}{5} = \frac{306}{5} = 61.2 \text{ kmph}$$

6. (a) Relative speed in same direction

$$= (85 - 77) \text{ km/h.} = 8 \text{ km/h.}$$

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$= \frac{360}{8} \times \frac{18}{5} = 162 \text{ seconds}$$

Time taken by them to cross each other = 162 seconds.

7. (b) Given

Speed of train started from Delhi = 85 km/h

Speed to train started from Puna = 67 km/h

Travelling time of both the train = Duration between 07 : 00 AM to 03 : 30 PM = 8.5 hour

Distance covered by the train started from Delhi = 85×8.5

$$= 722.5 \text{ km}$$

Distance covered by the train started from Puna = 67×8.5

$$= 569.5 \text{ km}$$

Hence, The distance between Delhi and Puna

$$= 722.5 + 569.5 = 1292 \text{ km}$$

8. (c) Relative Speed = $(80 + 82) = 162 \text{ km/h}$

Both trains meet After 1 hour 30 minute,

$$\text{Time} = 1.5 \text{ h}$$

Distance between the Trains = $162 \times 1.5 \text{ h} = 243 \text{ km}$

9. (c) In such a type of question we will make the time of starting the same for both the stations.

Assume, The starting time of station A is 9 am.

Now the distance

$$= 120 - 20 = 100 \text{ km}$$

Relative speed

$$= 20 + 30 = 50 \text{ km/h}$$

$$\text{Time} = \frac{100}{50} = 2 \text{ hour}$$

Time of meeting = 9 am. + 2 hour = 11 am.

10. (b) Let the train starting from Bangalore be A and from Channai is B.

Given,

Speed of A = 80 km/h

Speed of B = 95 km/h

Ratio of the speed of A and B

$$= 16 : 19$$

If time is constant then distance is directly proportional to the speed.

Hence, The ratio of distance covered by A and B

$$= 16 : 19$$

Total distance cover when A and B meets = $16 + 19$

$$= 35 \text{ units}$$

B will cover more distance by

$$= 19 - 16 = 3 \text{ units}$$

$$3 \text{ units} = 180 \text{ km}$$

$$35 \text{ units} = \frac{180}{3} \times 35 = 2100 \text{ km}$$



SMART APPROACH:-

Here time is constant

	A	B
Speed	→ 80	95
Distance	→ 80	95

$$95x - 80x = 15x = 180$$

$$\therefore (80 + 95) = 175x = \frac{180}{15} \times 175$$

$$2100 \text{ km}$$

11. (a) Relative Speed = $40 + 32$

$$= 72 \times \frac{5}{18} = 20 \text{ m/s}$$

Time taken in crossing each other

$$= \frac{121 + 99}{20} = \frac{220}{20} = 11 \text{ s}$$

12. (b) Distance between before 10 minute

$$= (120 + 80) \times \frac{10}{60} = 200 \times \frac{1}{6}$$

$$= 33.33 \text{ km}$$

13. (a) Let the speed of the train be S and its length be L .
Now, it crosses the first person in 12 sec
Relative speed as they move in same direction
 $= S - 4$

$$\Rightarrow L = (S - 4) \times \frac{12}{3600} \dots\dots(1)$$

Also, it crosses the second person in 14 sec
Relative Speed $= S - 6$

$$\Rightarrow L = (S - 6) \times \frac{14}{3600} \dots\dots(2)$$

From (1) and (2)

$$\Rightarrow (S - 4) \times \frac{12}{3600} = (S - 6) \times \frac{14}{3600}$$

$$\Rightarrow 12S - 48 = 14S - 84$$

$$\Rightarrow 12S - 14S = -84 + 48$$

$$\Rightarrow -2S = -36 \Rightarrow S = 18$$

Hence, The speed of train
 $= 18 \text{ km/h}$



SMART APPROACH:-

Distance is same

Let speed of train $= S$

$$(S - 4) \times 12 = (S - 6) \times 14$$

$$S = 18 \text{ km/h}$$

14. (b) Speed of train $x = 74 \text{ km/h}$
If Length of train $x = 3D$
Speed of train $y = 52 \text{ km/h}$

$$\text{Length of train } y = 3D \times \frac{2}{3} = 2D$$

$\therefore$ Both trains travelling in opposite direction

So the relative speed of train x and y
 $= 72 \text{ km/h} + 52 \text{ km/h}$
 $= 126 \text{ km/h}$

$$3D + 2D = 126 \times \frac{5}{18} \text{ m/s} \times 12 \text{ sec}$$

$$5D = 84 \times 5 = 84$$

$$\text{Length of train } x(3D)$$

$$= 84 \times 3 = 252 \text{ m}$$

15. (b) Let length of train $= D \text{ m}$

$$\therefore x = \frac{D + 300}{30} \text{ m/sec}$$

$$\frac{D}{(x - 6) \times \frac{5}{18}} = 20$$

$$\frac{D}{\frac{D + 300}{30} - 6 \times \frac{5}{18}} = 20$$

$$D = 20 \left(\frac{D + 300 - 50}{30} \right)$$

$$D = 2 \left(\frac{D + 250}{3} \right)$$

$$D = 500 \text{ m}$$

$$x = \frac{500 + 300}{30} \text{ m/sec}$$

$$x = \frac{800}{30} \times \frac{18}{5} = 96 \text{ km/h}$$

16. (c) Let length of $x = 3D$

$$\text{Length of } y = 3D \times \frac{2}{3} = 2D$$

Relative speed of trains x and y
 $= 74 \text{ km/h} + 52 \text{ km/h}$
 $= 126 \text{ km/h}$

$$3D + 2D = 126 \times \frac{5}{18} \times 12 \text{ m}$$

$$5D = 84 \times 5$$

$$D = 84 \text{ m}$$

$$\text{Length of } y(2D) = 2 \times 84 = 168 \text{ m}$$

17. (d) $\frac{400}{n} - \frac{400}{n + 10} = 2$

By hit and trial

$$n = 40 \text{ km/h}$$

Usual time taken by train to complete the journey $= \frac{400}{40}$

$$= 10 \text{ hours}$$

18. (c)

$$\text{Speed} \rightarrow 5 : 4$$

$$\text{Distance} \rightarrow 5 : 4$$

$$1 \text{ unit} \rightarrow 8 \text{ km (given)}$$

Faster engine have to travel to overtakes the slower one
 $= (8 \times 5) = 40 \text{ km}$

19. (b) Length of other train $= x$

$$\Rightarrow \frac{270 + x}{(42 + 57) \times \frac{5}{18}} = 18$$

$$\Rightarrow 270 + x = 495$$

$$\Rightarrow x = 225$$

20. (c) Length of train $= 212 \text{ m}$

$$\text{Speed} = 45 \text{ km/h} = 45 \times \frac{5}{18} \text{ m/s}$$

$$\text{Platform length} = 188 \text{ m}$$

Time to cross a platform

$$= \frac{(212 + 188)}{45 \times \frac{5}{18}} = \frac{400 \times 18}{45 \times 5} = 32 \text{ sec.}$$

21. (b) Let, speed of train 'B' be $x \text{ km/h}$
Speed of train A $= (x - 16) \text{ km/hr}$
ATQ,

$$\frac{384}{x - 16} - \frac{384}{x} = 4$$

$$\Rightarrow \frac{384x - 384x + 384 \times 16}{x(x - 16)} = 4$$

$$\Rightarrow 6144 = 4x^2 - 64x$$

$$\Rightarrow 4x^2 - 64x - 6144 = 0$$

$$\Rightarrow x^2 - 16x - 1536 = 0$$

$$\Rightarrow x^2 - 48x + 32x - 1536 = 0$$

$$\Rightarrow x(x - 48) + 32(x - 48) = 0$$

$$\Rightarrow x - 48 = 0$$

$$\Rightarrow x = 48$$

Hence speed of train B $= 48 \text{ km/h}$



SMART APPROACH:-

By Hit and Trial method,

Take speed of 'B' $= 48 \text{ km/h}$

$$\Rightarrow \frac{384}{32} - \frac{384}{48} = 4$$

$$\Rightarrow 4 = 4 \text{ (Satisfied)}$$

Hence,

The speed of train B $= 48 \text{ km/h}$

22. (b) Speed of car $= \frac{486}{9} = 54 \text{ km/h}$

$$\text{Speed of train} = 54 \times \frac{13}{6}$$

$$= 117 \text{ km/h}$$

Distance covered by the train in 6 hours

$$= 117 \times 6 = 702 \text{ km}$$

23. (d) Speed of the train $= 54 \text{ km/h}$

$$= 54 \times \frac{5}{18} = 15 \text{ m/s}$$

Required time to cross the bridge

$$= \frac{(342 + 438)}{15} = 52 \text{ sec.}$$





BOAT & STREAM

13

प्रतिष्ठा लक्ष्म

- Speed of the boat in still water be 17 km/h and speed of the stream be 5 km/h. What is the time taken by the boat to travel of 110 km downstream?

किं श हसज्जं खयक^१ । पं हखत्तक
 ष कं दर्वकिं खयक^१ पं हखत्तक बंद जत्त
 कदर्वकिं खपु किहसै^२ २ पं हखशकार हस
 पं ी जक्क हइ । जी कबम

SSC CPO 03/10/2023 (Shift-01)

- (a) 5 hours (b) 5.5 hours
(c) 6 hours (d) 4.5 hours
2. The speed of a boat in still water is 20 km/h, while the river is flowing at a speed of 8 km/h and the time taken to cover a certain distance upstream is 6 h more than the time taken to cover the same distance downstream. Find the distance.

किं लवण हस । जक ख ज्पि 02
पं हखतकब%रू पं ज खद्ध पं हखतक ख
ज्पि रूरू ब बिहवं चर्की दर्की र, पे भ
। फर्मियी छिटीइ जि हसा ज्ञन नक क
हइ हका छिदर्की रच जे भीइ जि
हसा ज्ञन नकरू हइ र प्र तकार फ वंद
छिटके खड्ड

SSC CPO 03/10/2023 (Shift-03)

- (a) 126 km (b) 125 km
(c) 120 km (d) 336 km
3. The speed of a boat in standing water is 6 km/h and the speed of the stream is 2.5 km/h. A man rows to a place at a distance of 59.5 kilometres and comes back to the starting point. The total time taken by him is:

किंश हसां जसां खयक 6 पं हखतक
 बं ८ र्कं दर्कं खयक 2.5 पं हखतक
 बंद । इपी जसू रे व्के पं । कखि
 खं छिर्ल पसके । चक्का लं शेकबं
 र्कं लसिकं पूसर्ल नक्खु र्केकबंद गूं र
 र्किकप डकज्जइं त हइ पं । जकबका

SSC CPO 04/10/2023 (Shift-01)

- (a) 22 hours (b) 18 hours
(c) 16 hours (d) 24 hours
4. A boat covers a distance of 72 km downstream in 6 hours, while it takes 12 hours to cover the same distance upstream. What is the speed of the boat in still water?

1. ਜਨਮ ਦਰਦੀਕ ਖਪਤ ਕਿਹਾ ਜਾਂਦਾ ਹੈ। 10 km ਖਪਤ
ਫਿਰ ਪ੍ਰਤੀ ਵਰਗ ਕਿਲੋਮੀਟਰ ਪਿੰਡ ਖਰਬ 5 ਪੰਡ ਦਰਦੀਕ
ਖਪਤ ਪਾਇਆ ਜਾਂਦਾ ਹੈ ਪ੍ਰਤੀ ਵਰਗ ਕਿਲੋਮੀਟਰ ਖਪਤ
ਜਿਹਾ ਹਸਤਾ 1 ਰੋਟੀ ਪ੍ਰਤੀ ਵਰਗ ਕਿਲੋਮੀਟਰ
ਹਸਤਾ ਖਪਤ ਪ੍ਰਤੀ ਵਰਗ ਕਿਲੋਮੀਟਰ

SSC CPO 04/10/2023 (Shift-01)

- (a) 10 km/h (b) 9 km/h
(c) 6 km/h (d) 8 km/h
5. The upstream speed of a boat is 8 km/h and the downstream speed is 15 km/h. What is the speed of the boat in still water and the speed of the stream (in km/h), respectively?

दरर्कं ख फालिखि पकिहस। जखं ख
यक द्ध पं हखतककबर्बर्क दर्कं ख पकि
हसगू जखं ख यक पं हखतककबर्बर्ब
किश। हसजखं ख यक दर्कं दर्कं ख
यक क्षपं हखतककहख 5 हकि पके खर। द

SSC CPO 04/10/2023 (Shift-02)

- (a) 11.5 and 3.5
 - (b) 3.5 and 11.5
 - (c) 3 and 11
 - (d) 11 and 3
6. Nikunj goes 4 kilometres against the current of a stream in 1 hour, and 2 kilometres along the current in 15 minutes. How long will it take him to go 7 kilometres in stationary water?

पं ॥ ३५॥ दर्किं र पालिखि पकिहसै तकर
हस३ पं । कखि॥ ४॥ दर्किं ख पकिहस
॥ ५॥ जव हस० पं । कखि॥ ख, छि॥ इ
॥ फिं कबड किं श हस। पं । कखि॥ ख
छि॥ इ ॥ जिहसण रपं । जक हइ । जसक

SSC CPO 05/10/2023 (Shift-01)

- (a) 1 hour 20 minutes
(b) 1 hour 5 minutes
(c) 1 hour 15 minutes
(d) 1 hour 10 minutes

7. A boat can travel 104 km downstream in 8 hours. If the speed of the stream is 2 km/h, then find in what time will it be able to cover 13 km upstream?

1 जमा छ तत्काल हसदरर्किक ख पकि हस
23 पं हखं ख छिंीइं िंी ख बढ
इप दरर्किक ख यक 0 पं हखतत्काल बर्ब%ी क
पके ख 1 पं नब जमा दरर्किक ख पालखि
पकि हसै 7 पं हखं ख छिंीपी जू हइ
हसीइं िं लक जख

SSC CPO 09/11/2022 (Shift-02)

- (a) $2\frac{2}{3}$ hours (b) $1\frac{4}{9}$ hours
(c) $2\frac{1}{2}$ hours (d) $1\frac{2}{3}$ hours

8. A boat can go 40 km downstream and 25 km upstream in 7 hours 30 minutes. It can go 48 km downstream and 36 km upstream in 10 hours. What is the speed (in km/h) of the boat in still water?

1. जका । तका 72 फजव हस 32 पं हख
दरकिं ख पकि हस ० पं हख दरकिं
ख पालखि पकि हस शकुं ख बंद इब
2. तका हस 3 द पं हख दरकिं ख पकि हस
० 7 पं हख दरकिं ख पालखि पकि हस
शकुं ख बंद कि 11 हस जका ख यक
४ पं हख तका हस पं ख बका

SSC CPO 09/11/2022 (Shift-03)

- (a) 6 (b) 12
(c) 9 (d) 15

9. The speed of a boat in still water is thrice the speed of the stream. If the boat takes 15.5 sec to go to a certain place downstream, then find the additional time required to cover the same distance travelling upstream.

किं श। हस। जम खयक % दर्वकिं ख
यक खीख ज्जख बंद इप जम दर्वकिं ख
प किहसपजयि चक्की शकार हसै के
सु कू हइ । रेख बं%ी क दर्वकिं ख
पालखे प किहसइक्क र्गिर का गी ज्जख
छिंइ जिं रप । च कइं च पे पंि
हइ पके ख्ख । द

SSC CPO 11/11/2022 (Shift-02)

- (a) 15.5 sec (b) 29 sec
(c) 31 sec (d) 35 sec

SOLUTIONS

1. (a) Speed of boat in still water (x) = 17 km/hr
Speed of stream (y) = 5 km/hr
Downstream speed ($x + y$) = 17 + 5 = 22 km/h

$$\therefore \text{Required time} = \frac{110}{22} = 5 \text{ hrs}$$

2. (a) Let, the required distance be 'D' kms

Speed of boat in still water (x) = 20 km/hr

Speed of stream (y) = 8 kmph

ATQ,

$$\frac{D}{x-y} - \frac{D}{x+y} = 6$$

$$\Rightarrow \frac{D}{12} - \frac{D}{28} = 6$$

$$\Rightarrow D(16) = 6 \times 12 \times 28$$

$$\therefore D = 126 \text{ km}$$

3. (d) Speed of boat in still water (x) = 6 kmph

Speed of stream (y) = 2.5 kmph

ATQ,

$$\frac{59.5}{6+2.5} + \frac{59.5}{6-2.5} = \text{time}$$

$$\Rightarrow 59.5 \left[\frac{1}{8.5} + \frac{1}{3.5} \right] = t$$

$$\Rightarrow \frac{59.5 \times 12}{8.5 \times 3.5} = t$$

$$\Rightarrow t = 24 \text{ hrs}$$

4. (b)

Let, x = speed of boat in still water

y = speed of stream

then,

ATQ,

$$\text{Downstream speed } (x + y) = \frac{72}{6} = 12$$

$$\text{and Upstream speed } (x - y) = \frac{72}{12} = 6$$

$$\therefore x = \frac{12+6}{2} = 9 \text{ km/hr}$$

5. (a) $v = 8 \text{ km/hr}$, $u = 15 \text{ kmph}$
 $\therefore$ speed of boat in still water

$$= \frac{v+u}{2} = \frac{23}{2} = 11.5 \text{ km/h}$$

and speed of stream

$$= \frac{u-v}{2} = \frac{15-8}{2} = \frac{7}{2} = 3.5 \text{ km/h}$$

6. (d) ATQ,

$$\text{Upstream speed } (x-y) = \frac{4}{1} = 4 \text{ km/h}$$

and Downstream speed ($x + y$)

$$= \frac{2}{1/4} = 8 \text{ km/h}$$

$$\therefore x = \frac{8+4}{2} = 6 \text{ km/hr}$$

$$\text{Hence, required time} = \frac{7}{6} = 1\frac{1}{6}$$

$$= 1 \text{ hr } 10 \text{ mins}$$

7. (b) Let the speed of boat in still water = $x \text{ km/h}$

Downstream speed of boat

$$= x + 2 = \frac{104}{8}$$

$$\Rightarrow x + 2 = 13 \text{ km/h}$$

$$\Rightarrow x = 11 \text{ km/h}$$

Speed of boat in upstream

$$= (11 - 2) = 9 \text{ km/h}$$

Time take by the boat to cover the distance of 13 km in upstream

$$= \frac{13}{9} \text{ km/h} = 1\frac{4}{9} \text{ km/h}$$

8. (c) Let the speed of the boat in still water = $x \text{ km/h}$

Speed of stream = $y \text{ km/h}$

CASE-I:

Boat can go 40 km downstream and 25 km upstream in 7 hours 30 minutes.

$$\Rightarrow \frac{40}{x+y} + \frac{25}{x-y} = 7.5 \dots\dots\dots(1)$$

CASE- II:

Boat can go 48 km downstream and 36 km upstream in 10 h.

$$\Rightarrow \frac{48}{x+y} + \frac{36}{x-y} = 10 \dots\dots\dots(2)$$

On solving (1) and (2) we get,

$$x = 9, y = 3$$

Hence, Speed of boat = 9 km/h

9. (a) Let the speed of stream be $x \text{ m/s}$ and speed of boat be $3x \text{ m/s}$.

Speed of boat in downstream = $x + 3x = 4x \text{ m/s}$

Distance covered = $4x \times 15.5$

$$= 62x \text{ m}$$

Speed of boat in upstream

$$= 3x - x = 2x \text{ m/s}$$

Time taken to cover 62x m in

$$\text{upstream} = \frac{62x}{2x} = 31 \text{ sec}$$

Additional time required to travel upstream = $31 - 15.5 = 15.5 \text{ sec}$.

10. (b) Speed of boat in still water (x)

$$= 15 \text{ km/h}$$

Speed of current still water (y)

$$= 5 \text{ km/h}$$

$$\text{Total time} = \frac{60}{15+5} + \frac{60}{15-5}$$

$$= 3 + 6$$

$$= 9 \text{ hours}$$

11. (a) Upstream Speed = $(x - y) \text{ km/h}$
Downstream Speed = $(x + y) \text{ km/h}$

$$\Rightarrow \frac{15}{x-y} = \frac{3}{2}$$

$$\Rightarrow \frac{15}{4(x-y)} = \frac{3}{2}$$

$$\Rightarrow 12x - 12y = 30 \dots\dots(1)$$

$$\text{Again, } \frac{13}{(x+y)} = 2$$

$$\Rightarrow 2x + 2y = 13 \dots\dots(2)$$

Now, Adding (1) & (2) $\times 6$, $\begin{array}{r} 12x - 12y = 30 \\ 12x + 12y = 78 \\ \hline 24x = 108 \end{array}$ $\Rightarrow x = \frac{9}{2} \text{ km/h}$ Time to row a distance of 90 km in still water = $90 \times \frac{2}{9} = 20$ Hours. 12. (a) $\frac{14}{B+S} + \frac{14}{B-S} = \frac{56}{15}$	Speed of current = 2 km/h (given) By option put speed of boat = 8 km/h $\text{So, } \frac{14}{8+2} + \frac{14}{8-2} = \frac{56}{15}$ $= \frac{14}{10} + \frac{14}{6} = \frac{56}{15}$ $= \frac{56}{15} = \frac{56}{15} \text{ (Satisfied)}$ Hence the speed of boat is 8 km/h	13. (c) Let speed of boat be x km/h. Speed of current = 9 km/h Distance between X and Y = 10.5 km Upstream speed = $(x - 9)$ km/h Downstream speed = $(x + 9)$ km/h ATQ, $\frac{10.5}{x-9} + \frac{10.5}{x+9} = 4$ Put $x = 12$ from the option. (Satisfied the equations) So, Speed of boat = 12 km/h.
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☆☆☆☆☆

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 **@Maths by Aditya ranjan**



14. If 86y5 is exactly divisible by 3, then the least value of y is:

यदि 86y5, 3 के पूर्णगुणित है तो y का न्यूनतम मान क्या होगा?

SSC CPO 10/11/2022 (Shift-03)

- (a) 3 (b) 0
(c) 1 (d) 2

15. Find the least value of (A + B) if the number 27B58A4 is completely divisible by 88.

यदि 27B58A4, 88 गुणित है तो (A + B) का न्यूनतम मान क्या होगा?

SSC CPO 10/11/2022 (Shift-03)

- (a) 5 (b) 2
(c) 4 (d) 7

16. If the 9 digit number 97x4562y8 is divisible by 88, what is the value of $(x^2 + y^2)$ for the smallest value of y, given that x and y are natural number.

यदि 97x4562y8, 88 के पूर्णगुणित है तो $(x^2 + y^2)$ का न्यूनतम मान क्या होगा?

SSC CPO 11/11/2022 (Shift-01)

- (a) 64 (b) 68
(c) 76 (d) 80

17. Find the least value of p so that 246p48 is divisible by 8.

p का न्यूनतम मान क्या होगा कि 246p48, 8 के पूर्णगुणित हो सके?

SSC CPO 11/11/2022 (Shift-01)

- (a) 2 (b) 1
(c) 4 (d) 0

18. Ramu had to select a list of numbers between 1 and 1000 (including both) which are divisible by both 2 and 7. How many such numbers are there?

रामू 1 और 1000 (दोनों सहित) के बीच के संख्याओं का एक सूची चुनना चाहता है जो 2 और 7 दोनों से विभाज्य हों। ऐसे संख्याओं की संख्या क्या होगी?

SSC CPO 11/11/2022 (Shift-01)

- (a) 142 (b) 71
(c) 97 (d) 642

19. The sum of the odd divisors of 216 is:

216 के विभाजकों में से विषम संख्याओं का योग क्या होगा?

SSC CPO 11/11/2022 (Shift-01)

- (a) 16 (b) 14
(c) 40 (d) 600

20. A six-digit number is divisible by 198. If the digits are rearranged, even then the number will be divisible by:

5 नमबरों का एक 6-अंकीय संख्या 198 से विभाज्य है। यदि अंकों को पुनर्व्यवस्थित किया जाए तो संख्या किससे विभाज्य होगी?

SSC CPO 11/11/2022 (Shift-02)

- (a) 3 (b) 6
(c) 2 (d) 66

21. A six-digit number 763254 is divisible by 18. If we subtract five times of 41 from the number, the new number which is formed the number will be divisible by:

763254, 18 से विभाज्य है। यदि हम संख्या से 41 के पांच गुणित को घटा देंगे तो नया संख्या किससे विभाज्य होगी?

SSC CPO 11/11/2022 (Shift-02)

- (a) 2 (b) 7
(c) 5 (d) 3

22. If the number 55p1067q9 is exactly divisible by 99, then pq is equal to:

यदि 55p1067q9, 99 से विभाज्य है तो pq का मान क्या होगा?

SSC CPO 11/11/2022 (Shift-03)

- (a) 35 (b) 28
(c) 36 (d) 42

23. Two positive number differ by 3951. When the larger number is divided by the smaller number, the quotient is 12 and the remainder is 13. The sum of the digits of the larger number is:

दो धनात्मक संख्याओं का अंतर 3951 है। जब बड़ी संख्या को छोटी संख्या से विभाजित किया जाता है तो भागफल 12 और शेषफल 13 है। बड़ी संख्या के अंकों का योग क्या होगा?

SSC CPO 11/11/2022 (Shift-03)

- (a) 12 (b) 16
(c) 18 (d) 14

24. In a test (+5) marks are given for every correct answer and (-2) marks are given for every incorrect answer. Jay answered all the questions and scored (-12) marks, though he got 4 correct answers.

How many of his answers were INCORRECT?

एक परीक्षा में प्रत्येक सही उत्तर के लिए +5 अंक दिए जाते हैं और प्रत्येक गलत उत्तर के लिए -2 अंक दिए जाते हैं। जेय सभी प्रश्नों का उत्तर दिया और -12 अंक प्राप्त किए, भले ही उन्होंने 4 सही उत्तर दिए।

91 का अंक 9 प्राप्त करने में मदद

SSC CPO 11/11/2022 (Shift-03)

- (a) 8 (b) 32
(c) 16 (d) 20

25. Let $x = 224$ and $y = 322$. If the highest common factor of $23x$ and $a \times y$ is divisible by x and y , then what can be the possible value of a ?

यदि $x = 224$ और $y = 322$ हों, तो $23x$ और $a \times y$ का उच्चतम समांतर माप x और y दोनों से विभाज्य हो, तो a का संभावित मान क्या होगा?

SSC CPO 11/11/2022 (Shift-03)

- (a) 16 (b) 8
(c) 12 (d) 4

26. What are the values of '&' and '#', respectively, if the following number is perfectly divisible by 9?

51&918#0

यदि संख्या 51&918#0, 9 से पूर्णगुणित है तो '&' और '#' के मान क्या होंगे?

SSC CPO 11/11/2022 (Shift-03)

- (a) 9 and 8 (b) 2 and 2
(c) 4 and 5 (d) 8 and 4

27. If $1433 \times 1433 \times 1422 \times 1425$ is divided by 12, then what is the remainder?

$1433 \times 1433 \times 1422 \times 1425$ को 12 से विभाजित करने पर शेषफल क्या होगा?

SSC CPO 23/11/2020 (Shift-1)

- (a) 3 (b) 9
(c) 8 (d) 6

28. If a nine-digit number 785x3678y is divisible by 72 then the value of $(x - y)$ is:

यदि 785x3678y, 72 से विभाज्य है तो $(x - y)$ का मान क्या होगा?

SSC CPO 23/11/2020 (Shift-1)

- (a) 0 (b) -2
(c) -1 (d) 2

29. The students of a class donated a sum of Rs.2,209. If each student donated as many rupees as the number of students in the class, then the number of students in the class is:

कैसे इकट्ठा किया - सफल विचार कि इस संकल्पना कि हनीय 6 काय - सफल 9 हा निरूपित लिखा कि जहा कि किडसरी। य - सफल सीकई म सीनू हिरीकडसरीय - सफल सीकई म सीडसरीक।

SSC CPO 23/11/2020 (Shift-2)

- (a) 49 (b) 53
(c) 51 (d) 47

30. The remainder when $75 \times 73 \times 78 \times 76$ is divided by 34 is:

$75 \times 73 \times 78 \times 76$ कि सी 34 है कि सफल ह कि रिटि रि सफल थंसप छ डिडसरीक।

SSC CPO 23/11/2020 (Shift-2)

- (a) 15 (b) 22
(c) 18 (d) 12

31. The remainder when $72 \times 73 \times 78 \times 76$ is divided by 35 is:

$72 \times 73 \times 78 \times 76$ कि सी 35 है कि सफल ह कि रिटि रि सफल थंसप छ डिडसरीक।

SSC CPO 24/11/2020 (Shift-1)

- (a) 12 (b) 8
(c) 22 (d) 15

32. If 6-digit number $5x2y6z$ is divisible by 7, 11 and 13, then the value of $(x - y + 3z)$ is:

यदि 6-म संख्येदस है म सी $5x2y6z$; 7, 11 म सी 13 है कि सफल नू हिरी $(x - y + 3z)$ क सीर स डिडसरीक।

SSC CPO 24/11/2020 (Shift-1)

- (a) 0 (b) 4
(c) 7 (d) 9

33. The students of a class donated a sum of Rs.2,809 to the Fund. Each student donated as many rupees as the number of students in the class. The number of students in the class is:

इकट्ठा किया - सफल वि 7 कि ई सफल लिखा कि हनीय 6 काय ले सफल 9 हा निरूपित लिखा कि जहा इकडसरीय - सफल सीकई म सीनू हिरी कडसरीय - सफल सीकई म सीडसरीक।

SSC CPO 24/11/2020 (Shift-1)

- (a) 47 (b) 51
(c) 49 (d) 53

34. How many numbers between 400 and 700 are divisible by 5, 6 and 7? 400 म सी 700 कि डु जिन इकहा है म सी नू डि सी 5, 6 म सी 7 है कि सफल नूड

SSC CPO 24/11/2020 (Shift-2)

- (a) 20 (b) 10
(c) 2 (d) 5

35. When a number is successively divided by 3, 4 and 7, the remainders obtained are 2, 3 and 5, respectively. What will be the remainder when 84 divided the same number?

उ कि है म सी सी प्र धर 3, 4 म सी 7 है कि सफल ह कि सी उ स सी नू हिरी प्र धर 2, 3 म सी 5 थंसप छ डिडसरीक। (नू डि) है इ म सी सी 84 है कि सफल ह कि सी उ स हिरी थंसप छ डिडसरीक।

SSC CPO 24/11/2020 (Shift-2)

- (a) 71 (b) 30
(c) 48 (d) 53

36. If $1433 \times 1433 \times 1422 \times 1425$ is divided by 10, then what is the remainder?

यदि $1433 \times 1433 \times 1422 \times 1425$ म सी 10 है कि सफल ह कि सी उ स सी नू हिरी थंसप छ डिडसरीक।

SSC CPO 25/11/2020 (Shift-1)

- (a) 9 (b) 0
(c) 3 (d) 8

37. What is the sum of the digit of the least number when divided by 15, 18 and 36 leaves the same remainder 9 in each case and is divisible by 11?

है 15 से है 15 से है म सी म सी क सी स सं ज सीन सं है 15, 18 म सी 36 है कि सफल ह कि रिटि रि 6 काय स हरि 9 थंसप छ) सं म सी द न 11 है कि सफल न सं

SSC CPO 25/11/2020 (Shift-1)

- (a) 16 (b) 17
(c) 15 (d) 18

38. If a nine-digit number $785x3678y$ is divisible by 72, then the value of $(x + y)$ is:

यदि 9-म संख्येदस है म सी $785x3678y$, 72 है कि सफल नू हिरी $(x + y)$ कि सीर स डिडसरीक।

SSC CPO 25/11/2020 (Shift-1)

- (a) 10 (b) 5
(c) 12 (d) 20

39. How many number between 300 and 700 are divisible by 5, 6 and 8? 300 म सी 700 कि डु जिन इकहा है म सी नू डि सी 5, 6 म सी 8 है कि सफल नूड

SSC CPO 25/11/2020 (Shift-2)

- (a) 5 (b) 20
(c) 3 (d) 2

40. When a number is successively divided by 3, 4 and 7, the remainder obtained is 2, 3 and 5 respectively. What will be the remainder when 42 divides the same number?

उ कि है म सी सी प्र धर 3, 4 म सी 7 है कि सफल ह कि सी उ स सी नू हिरी थंसप छ प्र धर 2, 3 म सी 5 थंसप छ डिडसरीक। (नू डि) है इ म सी सी अ है कि सफल ह कि सी उ स हिरी थंसप छ डिडसरीक।

SSC CPO 25/11/2020 (Shift-2)

- (a) 41 (b) 31
(c) 30 (d) 29

41. If the six-digit number $479xyz$ is exactly divisible by 7, 11 and 13, then $(y + z) \div x$ is equal to:

यदि 6-म संख्येदस है म सी $479xyz$ कि सफल म सी 7, 11 म सी 13 है कि सफल नू हिरी $(y + z) \div x$ क सीर स है नू,

SSC CPO 09/12/2019 (Shift-01)

- (a) 4 (b) $\frac{11}{9}$

- (c) $\frac{7}{13}$ (d) $\frac{13}{7}$

42. If the 7-digit number $x468y05$ is divisible by 11, then what is the value of $(x + y)$?

यदि 7-म संख्येदस है म सी $x468y05$, 11 है कि सफल नू हिरी $(x + y)$ कि सीर स ज सीन सं

SSC CPO 09/12/2019 (Shift-02)

- (a) 8 (b) 10
(c) 14 (d) 12

43. How many natural number less than 1000 are divisible by 5 or 7 but NOT by 35?

है 777 है कि र कि हा इ स थ है म सी स 1 है कि सफल नू डि 2 का क्षि है नि नू

SSC CPO 11/12/2019 (Shift-01)

- (a) 285 (b) 313
(c) 341 (d) 243

44. When a certain number is divided by 65, the remainder is 56. When the same number is divided by 13, the remainder is x . What is the value of $\sqrt{5x-2}$?

उ) जिकरियु हौ म सीकसी%तौ िके स्सह यक सीउससीनू हिसेधंस्सष्ट ति%रिस्सहनिहसीनू, १३ ई म सीकसीउ) िक्षै िके स्सहयि स उससीनू हिसेधंस्सष्ट िरिस्सहनिहसीनू $\sqrt{5x-2}$ कसीरसजि सीनूद

SSC CPO 11/12/2019 (Shift-02)

- (a) $2\sqrt{7}$ (b) $\sqrt{13}$
(c) $2\sqrt{2}$ (d) $3\sqrt{2}$

45. Let x be the least number divisible by 16, 24, 30, 36 and 45, and x is also a perfect square. What is the remainder when x is divided by 123?

रसजि इष्टजिदिन 16, 24, 30, 36 मसीर 45 िके स्स निूहिक्सा ि जिकरिस्सदखी खीनूडि) िरिक्सीवक्षै िके स्सहयि स सीउससीनू हिसेधंस्सष्ट िकहा स ५ हसीनूद

SSC CPO 11/12/2019 (Shift-02)

- (a) 100 (b) 40
(c) 103 (d) 33

46. If a 5-digit number $538xy$ is divisible by 3, 7 and 11, then the value of $(x^2 + y^2)$ is:

यतिमिकसीदख ईजिकौ म सी 538xy, 3, 7 मसीरिषौ रिस्सउके स्स निूहिसे $(x^2 + y^2)$ किस रसजि इष्टजि,

SSC CPO 12/12/2019 (Shift-01)

- (a) 25 (b) 10
(c) 17 (d) 13

47. Which of the following number is exactly divisible by 6?

यु।यु यस्सरि किकौ ई म सीरै रिस्सउ के स्सहनिूद

SSC CPO 12/12/2019 (Shift-02)

- (a) 4325672 (b) 5643252
(c) 96543111 (d) 465466

48. How many natural numbers up to 2001 are divisible by 3 or 4 but NOT by 5?

व77रिहकिकहा ईरिस्सयकौ म सीरिषि सीउ िके स्स निूडि कति िनइ

SSC CPO 13/12/2019 (Shift-01)

- (a) 768 (b) 801
(c) 934 (d) 1067

49. If r is the remainder when each of 6454, 7306 and 8797 is divided by the greatest number d ($d > 1$), then $(d - r)$ is equal to:

यतिधंस्सष्ट निूडि सीअरि 1१7मसीरि िरि कसीरि ई ि ई म सी $d(d > 1)$ िके स्सह कृ।रि रिस्सहनिहसीनू हिसे $(d - r)$ कसीरस इष्टजि,

SSC CPO 13/12/2019 (Shift-01)

- (a) 126 (b) 64
(c) 137 (d) 149

50. The number 1563241234351 is:

म सी 1563241234351:

SSC CPO 13/12/2019 (Shift-02)

- (a) Divisible by both 3 and 11
(b) Divisible by 11 but not by 3
(c) Neither divisible by 3 nor by 11
(d) Divisible by 3 but not by 11

ANSWER KEY

1.(d)	2.(d)	3.(a)	4.(d)	5.(c)	6.(d)	7.(b)	8.(b)	9.(b)	10.(c)
11.(d)	12.(a)	13.(d)	14.(d)	15.(b)	16.(d)	17.(d)	18.(b)	19.(c)	20.(a)
21.(b)	22.(a)	23.(b)	24.(c)	25.(a)	26.(d)	27.(d)	28.(d)	29.(d)	30.(d)
31.(b)	32.(c)	33.(d)	34.(c)	35.(a)	36.(b)	37.(d)	38.(a)	39.(c)	40.(d)
41.(a)	42.(d)	43.(a)	44.(d)	45.(d)	46.(d)	47.(b)	48.(b)	49.(d)	50.(c)

SOLUTIONS

1. (d) If the sum of digits is divisible by 9, Then the whole number will be divisible by 9.
Sum of digits of the number $8x5215 = 21 + x$
Hence By Option(d), $x = 6$.
2. (d) If any number N has only two factors 1 and N, Then the number is the Prime Number.
Option(d) 89 has only two factors which are 1 and 89 only.
Hence, Option(d) is correct.
3. (a)
$$\begin{array}{ccc} A & B & C \\ \downarrow & \downarrow & \downarrow \\ x+23 & x+16 & x(\text{Let}) \end{array}$$

Given that,
 $A + B + C = 255$
Then, $(x + 23) + (x + 16) + x = 255$
 $\Rightarrow 3x + 39 = 255$
 $\Rightarrow 3x = 255 - 39$
 $\Rightarrow 3x = 216$
 $\Rightarrow x = \frac{216}{3} = 72$
Hence, $C = 72$, $B = 88$, $A = 95$
Now the value of,
 $3A + C - 4B = 3(95) + 72 - 4(88)$
 $= 285 + 72 - 352$
 $= 357 - 352 = 5$
4. (d) Given Number = 647592
Rearranged Number = 245679
Here the sum of digits of rearranged number = 33
Hence, the Number will be divisible by 3
5. (c) 312, 936, 1872 and 7176 are divisible by 156
 $\frac{312}{156} = 2$; $\frac{936}{156} = 6$;
 $\frac{1872}{156} = 12$; $\frac{7176}{156} = 46$
Hence Required Answer = 4
6. (d) The factor of 196 = 1, 2, 4, 7, 14, 28, 49, 98, 196
Number of factors which are divisible by 4 = 3
7. (b) Given Number = $72x8431y4$
We know, if a number is divisible by 9 and 4, the number will be divisible by 36

- If the number's last two digits are divisible by 4, the entire number will also be divisible by 4.
If the number's sum of digits is divisible by 9, the entire number will also be divisible by 9
Now,
Last two digit of $72x8431y4$ is $y4$
We can assume $y = 0, 2, 4, 6, 8$
sum of digits = $29 + x + y$
Here, assume such values of x and y so that the sum will be divisible by 9.
if we assume $y = 0$ the option will not satisfy hence we will assume another value.
Therefore, $y = 2$ then $x = 5$
$$\frac{x}{y} - \frac{y}{x} = \frac{5}{2} - \frac{2}{5}$$

$$= \frac{25-4}{10} = \frac{21}{10} = 2\frac{1}{10}$$
8. (b) Sum of the number is $= 13 + x + y$
Assume the minimum value of $(x + y)$ so that the sum will be divisible by 9.
Hence, The value = 5
 9. (b) Number = 150328
Rearranged Number = 853210
Resultant Number
 $= 853210 - 5 \times 13$
 $= 853210 - 65 = 853145$
Last Digit of the resultant number is 5
Hence the resultant number will be divisible by 5
 10. (c) Given Number = 34R05030M6
if the number's last 4 digits is divisible by 16, the entire no will also be divisible by 1
Last 4 digits = 30M6
With the help of basic division you will get $M = 5$
if the difference of the sum of digit at odd position and sum of digits at even position in a number is 0 or 11, the number will be divisible by 11.
Hence,
 $(3 + R + 5 + 3 + M) - (4 + 0 + 0 + 0 + 6)$
 $= 11 + R + M - 10$

- $= 11 + R + 5 - 10$
 $= 16 + R - 10$
 $= 6 + R$
Hence, $R = 5$
Required Answer (c)
11. (d) Number = 6336633P
ATQ, Number is divisible by 132
We know, $132 = 2 \times 2 \times 3 \times 11$
Hence, We can say that number is also divisible by 11.
We will use the concept of divisibility of 11
 $\therefore$ sum of odd places digit = sum of even places digit
 $\Rightarrow 6 + 3 + 6 + 3 = (3 + 6 + 3 + P)$
 $\Rightarrow 18 = 12 + p$
 $\Rightarrow 18 - 12 = P$
 $\Rightarrow 6 = P$
 12. (a) Sum of digit of the Number $= 30 + x$
 $\therefore 30 + [15] = 45$, which is divisible by 9.
Hence, $x = 15$
 13. (d) Let $476**0 = 476xy0$
Sum of Digits = $17 + x + y$
By the divisibility rule of 11
 $\Rightarrow 4 + 6 + y = 7 + x + 0$
 $\Rightarrow 10 + y = 7 + x$
From option (d)
 $y = 5$ and $x = 8$
 14. (d) [If sum of digits of a number is divisible by 3, the entire number will be divisible by 3]
Sum of digits = $19 + y$
Hence, $y = 2$
 15. (b) Given
Number = 27B58A4
[Divisibility by 8 = Check last three digit]
 $\therefore 8A4 \div 8 \rightarrow$ minimum value of $A = 2$
by the divisibility rule of 11-
 $2 + B + 8 + 4 = 7 + 5 + A$
 $\Rightarrow 14 + B = 12 + 2$
 $\Rightarrow 14 + B = 14$
 $\Rightarrow B = 0$
Hence, $A + B = 2$
 16. (d) Factor of 88 = 8×11
For the smallest possible natural number of y -
 $\Rightarrow 2y8$ will be divisible by 8
 $\Rightarrow$ So, y will be 4 for 248, which is divisible by 8

- As $y = 4$,
Now the number is $-97x456248$
As $y = 4$, The possible value of x for which $97x456248$ will be divisible by 11.
Sum of odd places digit in number $= 8 + 2 + 5 + x + 9$
 $= 24 + x$
Again, sum of even places digit in number $= 4 + 6 + 4 + 7 = 21$
Difference $= 24 + x - 21$
 $= 3 + x$
Hence for $x + 3$ to be divisible by 11,
 $x = 11 - 3 = 8$
Therefore, $x^2 + y^2 = 8^2 + 4^2$
 $= 64 + 16 = 80$
17. (d) We know, if the last three digits of a number is divisible by 8, the number will be divisible by 8.
For the least possible value of p $\Rightarrow p48$ will be divisible by 8.
Hence, $p = 0$
18. (b) LCM of 2 and 7 = 14
When we divide 1000 by 14 we get 71 as quotient and 6 as remainder.
Therefore, There is 71 numbers which are divisible by both 2 and 7.
19. (c) Prime factorization of 216 $= 2^3 \times 3^3$
Sum of odd divisors $= (3^0 + 3^1 + 3^2 + 3^3)$
 $= (1 + 3 + 9 + 27) = 40$
20. (a) Prime factor of $198 = 3 \times 6 \times 11$
Hence, Any number (Say N) is divisible by 198 if the number is divisible by 3, 6 and 11.
If we rearrange the digit of the number the divisibility rule of 6 and 11 will hamper; but the divisibility rule of 3 is based on the sum of digits which will not change.
Hence, The new Number is divisible by 3.
21. (b) Number = 763254
New Number $= 763254 - 5 \times 41$
 $= 763254 - 205$
 $= 763049$
 $\Rightarrow 763049$ is divisible by 7
22. (a) Given, $55p1067q9$ is divisible by 99
i.e., The number is also divisible by 9 and 11.
Sum of digits $= 33 + p + q$ (1)
If the number of divisible by 9 i.e. sum will be divisible by 9.
Again, By the divisibility rule of 11 $\Rightarrow 5 + p + 0 + 7 + 9 - (5 + 1 + 6 + q)$
 $\Rightarrow 21 + p - (12 + q)$
 $\Rightarrow 21 + p - 12 - q$
 $\Rightarrow 9 + p - q$ (2)
Assume such values of p and q that satisfies the eqn. -1 & eqn.-2 with respect to divisibility rule of 9 and 11
So, $p = 7$ and $q = 5$
Product $= 35$
23. (b) Assume Larger Number $= x$ and Smaller Number $= y$
 $\Rightarrow x - y = 3951$ [1]
ATQ, When the larger number is divided by smaller number we get-
Quotient $= 12$ and Remainder $= 13$
We know-
Dividend $=$ Divisor $\times$ Quotient $+$ Remainder
 $\Rightarrow x = y \times 12 + 13$
 $\Rightarrow x - 12y = 13$ [2]
On subtracting Equation [1] & [2], we get-
 $\Rightarrow x - y - x + 12y = 3951 - 13$
 $\Rightarrow 11y = 3938$
 $\Rightarrow y = 358$
From Equation[1], $x = 3951 + 358$
 $= 4309$
Thus, The sum of digits $= 4 + 3 + 0 + 9 = 16$
24. (c) Correct Answer $= +5$ Marks
Incorrect Answer $= -2$ Marks
Marks Scored $= -12$ Marks
Number of questions answered correctly $= 4$
Let the total number of question be x
ATQ,
 $\Rightarrow 4 \times 5 + (x - 4) \times (-2) = -12$
 $\Rightarrow 20 - 2x + 8 = -12$
 $\Rightarrow -2x = -12 - 28$
 $\Rightarrow -2x = -40$
 $\Rightarrow x = 20$
Number of question answered incorrectly $= 20 - 4 = 16$
25. (a) $\Rightarrow 23 \times 224 = a \times 322$
 $\Rightarrow a = \frac{23 \times 224}{322}$
 $\Rightarrow a = 16$
26. (d) Given Number $= 51\&918\#0$
Sum of Digits $= 24 + \& + \#$
Assume such value of $\&$ and $\#$ from the options so that sum will be divisible by 9.
By Option (d)-
Sum of digits $= 24 + 8 + 4 = 36$ (divisible by 9)
Hence, Answer (d)
27. (d) $[1433 \times 1433 \times 1422 \times 1425] \div 12$
Remaining $= ?$
 $\left(\frac{1433}{12}\right)\left(\frac{1433}{12}\right)\left(\frac{1422}{12}\right)\left(\frac{1425}{12}\right)$
Remainder 5569
 $\Rightarrow 5 \times 5 \times 6 \times 9 = \frac{1350}{12}$
Remainder $= 6$
28. (d) $785x3678y$ divided by 72
 $8 \times 9 \frac{78y}{8}$ So $y = 4$
 $785x36784$ divided by 9
 $x = 6$
 $x - y = 6 - 4 = 2$
29. (d) $x \times x = 2209$
 $x^2 = 2209$
 $x = 47$
30. (d) $75 \times 73 \times 78 \times 76$ Divisible by 34, Remainder $= ?$
 $\frac{75}{34} \times \frac{73}{34} \times \frac{78}{34} \times \frac{76}{34}$
Remainder $= 7 \times 5 \times 10 \times 8$
 $\Rightarrow \frac{2800}{34} =$ Remainder $= 12$
31. (b) $72 \times 73 \times 78 \times 76$ Divisible by 35, Remainder $= ?$
 $\frac{72}{35} \times \frac{73}{35} \times \frac{78}{35} \times \frac{76}{35}$
Remainder $= 2 \times 3 \times 8 \times 6 = \frac{288}{35}$,
Remainder $= 8$
32. (c) $5x2y6z$, divisible by, 7, 11, 13
Number 1001 divisible by 7, 11, 13
So $5x2y6z$
 $x = 6$
 $y = 5$
 $z = 2$
No - 562562 is divided by 7, 11, 13
 $(x - y + 3z) = (6 - 5 + 3 \times 2) = 7$
33. (d) $x \times x = 2809$
 $x^2 = 53^2$
 $x = 53$
34. (c) LCM of 5, 6, 7 = 210
I - $210 \times 1 = 210$
II - $210 \times 2 = 420$
III - $210 \times 3 = 630$
Between 400 and 700
420 and 630, 2 Numbers
35. (a)
- | | | |
|---|---|----|
| 3 | | 51 |
| | 2 | |
| 4 | | 12 |
| | 3 | |
| 7 | | 1 |
| | 5 | |

- $\therefore 7 \times 1 + 5 = 12$
 $12 \times 4 + 3 = 51$
 $51 \times 3 + 2 = 155$
 So, $\frac{155}{84}$, Remainder = 71
36. (b) $1433 \times 1433 \times 1422 \times 1425$ divisible by 10, Remainder = ?
 $\therefore$ Last digit 5 and 2 multiple given last digit 0
 If any numbers last digit is zero, and that number are divided by 10, Remainder will be zero
 Remainder = 0
37. (d) LCM of 15, 18, 36
 $\Rightarrow \frac{180k + 9}{11} = \frac{4k + 9}{11}$, $k = 6$
 $\Rightarrow \frac{180 \times 6 + 9}{11} = \frac{1089}{11}$
 Sum of digit = $1 + 0 + 8 + 9 = 18$
38. (a) $785x3678y$,
 Divisible by 72, 8×9
 $\frac{78y}{8}$, $y = 4$
 $\frac{785x36784}{9}$, $x = 6$
 $(x + y) = 6 + 4 = 10$
39. (c) LCM of 5, 6, 8 = 120
 Number between = $300 - 700$
 I - $120 \times 3 = 360$
 II - $120 \times 4 = 480$
 III - $120 \times 5 = 600$
 Total = 3
40. (d)
- | | | |
|---|---|----|
| 3 | | 51 |
| | 2 | |
| 4 | | 12 |
| | 3 | |
| 7 | | 1 |
| | 5 | |
- $7 \times 1 + 5 = 12$
 $12 \times 4 + 3 = 51$
 $51 \times 3 + 2 = 155$
 $\frac{155}{42}$, Remainder = 29
41. (a) 6 digit number in which 3 digit repeat $xyzxyz$ is divisible by 1001
 Comparing on 479479 to $479xyz$
 $x = 4$, $y = 7$ and $z = 9$
 Now, $\frac{(y + z)}{x} = \frac{7 + 9}{4} = \frac{16}{4} = 4$

42. (d) $x468y05$ divisible by 11
 Then,
 Some of even place value
 $\rightarrow 4 + 8 + 0 = 12$
 Some of odd place value
 $\rightarrow x + 6 + y + 5 = x + y + 11$
 Put, $x + y = 12$
 $\frac{x + y + 11 - 12}{11} = \frac{12 + 11 - 12}{11} = \frac{11}{11} = 1$
 So,
 $x + y = 12$
43. (a) Number less than 1000 are
 divisible by 5 are = $\left(\frac{1000}{5} - 1\right)$
 $= 199$
 Number less than 1000 are
 divisible by 7 are = $\frac{1000}{7} = 142$
 Number less than 1000 are
 divisible by 35 are = $\frac{1000}{35} = 28$
 Number less than 1000 are
 divisible by 7 or 5 but not 35 are
 $= 199 + 142 - (2 \times 28)$
 $= 341 - 56 = 285$
44. (d) $65 \rightarrow 13 \times 5$
 $= 13 \times n + 56$
 put $n = 10$
 $= 13 \times 10 + 56 = 186$
 divided 186 by 65 it gives
 remainder 56
 So, After divideing 186 by 13 gives
 remainder = $4x = 4$
 $= \sqrt{5x - 2} = \sqrt{5 \times 4 - 2} = \sqrt{18} = 3\sqrt{2}$
45. (d) LCM of (16, 24, 30, 36 and 45)
 is
 $LCM = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5$
 $= 720$
 As we know,
 Number is perfect square
 $LCM = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 5$
 $= 3600$
 When 3600 is divided by 123,
 Then the remainder is 33
46. (d) $538xy$ is divisible by (3, 7 and 11)
 value of $(x^2 + y^2)$
 $=$ put, $x = 2$, $y = 3$
 then, 53823 is exactly divisible by
 (3, 7, 11)
 So, $(x^2 + y^2) = ((2)^2 + (3)^2) = 13$

47. (b) As we know, $6 = 2 \times 3$
 Check the options using the
 divisibility rule of 2 and 3.
 $\Rightarrow 5643252$ is exactly divisible by 6
48. (b) Number which are divisible by
 'a' or 'b' = (Number divisible by 'a') +
 (Number divisible by 'b') - Number
 divisible by LCM of 'a' and 'b')
 Now,
 Number which are divisible by 3
 or 4 up to 2001 are = $\frac{2001}{3} + \frac{2001}{4}$
 $-\frac{2001}{123} = 667 + 500 - 166 = 1001$
 Number which are divisible by 3
 or 4 but not 5 = (Number divisible
 by 3 or 4) - (Number divisible by
 LCM of 3 and 5) - Number divisible
 by LCM of 4 and 5) + (Number
 divisible by LCM of 3, 4, and 5)
 Number which is divisible by 3 or
 4 but not by 5 upto 2001 are
 $= \frac{2001}{15} + \frac{2001}{20} - \frac{2001}{60} = 1001 - 33$
 $- 100 + 33 = 801$
49. (d) Number $7306 - 6454 = 852$
 $8797 - 7306 = 1491$
 $8797 - 6454 = 2343$
 HCF of (852, 1491, 2343) = 213
 6454 divided by 213
 Remainder 64
 $d - r = (213 - 64) = 149$
50. (c) Divisibility rule of 3 $\Rightarrow$ A
 number is divisible by 3 if the sum
 of its digit is divisible by 3
 Divisibility rule of 11 $\Rightarrow$ If the
 difference of the alternative sum
 of digit of the number is a multiple
 of 11
 Sum of the digit of the number
 (1563241234351)
 $= (1 + 5 + 6 + 3 + 2 + 4 + 1 + 2 + 3 +$
 $4 + 3 + 5 + 1) = 40$
 40 is not divisible by 3
 Now, divisibility rule (11)
 $(5 + 3 + 4 + 2 + 4 + 5) - (1 + 6 + 2 +$
 $1 + 3 + 3 + 1)$
 $= (23 - 17) = 6$
 6 is not multiple of (11) so the
 number is not divisible by 11
 Hence the given number is neither
 divisible by 3 nor by 11.



LCM & HCF

15

प्रश्नोत्तर

1. Find the LCM of 15, 24, 35 & 54.
किसी संख्या की हल्की सी रेखाएँ पस्तवर्त (LCM) की दरों के 2

SSC CPO 03/10/2023 (Shift-01)

- (a) 7650 (b) 7560
(c) 6570 (d) 5670

2. Two numbers are in the ratio 3 : 4. The product of their HCF and LCM is 2700. The difference of the numbers is:

दो संख्याएँ 3 : 4 के अनुपात में हैं। उनके महत्तम समापवर्तक (HCF) और लघुत्तम समापवर्तक (LCM) का गुणनफल 2700 है। संख्याओं के बीच का अंतर ज्ञात कीजिए।

SSC CPO 03/10/2023 (Shift-01)

- (a) 45 (b) 105
(c) 60 (d) 15

3. The product of two numbers is 726 and their HCF is 11, then their LCM is:

दो संख्याओं का गुणनफल 726 है और उनका HCF 11 है। इन संख्याओं का LCM ज्ञात करें।

SSC CPO 03/10/2023 (Shift-01)

- (a) 68 (b) 76
(c) 66 (d) 58

4. The HCF and the LCM of two numbers are 5 and 175, respectively. If the ratio of the two numbers is 5:7, the larger of the two numbers is _____.

दो संख्याओं का HCF 5 और LCM 175 है। यदि संख्याओं का अनुपात 5:7 है, तो बड़ी संख्या का मान ज्ञात करें।

SSC CPO 03/10/2023 (Shift-01)

- (a) 75 (b) 35
(c) 45 (d) 25

5. Find the LCM of $\frac{3}{2}$, $\frac{81}{16}$ and $\frac{9}{8}$

$\frac{3}{2}$, $\frac{81}{16}$ और $\frac{9}{8}$ संख्याओं का LCM ज्ञात करें।

SSC CPO 03/10/2023 (Shift-02)

$$(a) \frac{111}{2}$$

$$(b) \frac{91}{2}$$

$$(c) \frac{81}{2}$$

$$(d) \frac{101}{2}$$

6. The LCM of $\frac{1}{3}$, $\frac{3}{5}$, $\frac{4}{7}$ and $\frac{9}{16}$ is:

$$\frac{1}{3}, \frac{3}{5}, \frac{4}{7} \text{ और } \frac{9}{16} \text{ संख्याओं का LCM ज्ञात करें।}$$

SSC CPO 03/10/2023 (Shift-02)

- (a) 38 (b) 49
(c) 36 (d) 81

7. The least common multiple of 210, 336 and 504 is:

210, 336 और 504 संख्याओं का न्यूनतम समापवर्तक ज्ञात करें।

SSC CPO 03/10/2023 (Shift-02)

- (a) 4560 (b) 3360
(c) 2100 (d) 5040

8. Find the greatest possible length (in metres) that can be used to exactly measure the lengths 6 m, 5 m 25 cm and 12 m 50 cm.

6 मीटर, 5 मीटर 25 सेंटीमीटर और 12 मीटर 50 सेंटीमीटर की लंबाइयों को बिल्कुल मापने के लिए सबसे बड़ा लंबाई (मीटर में) ज्ञात करें।

SSC CPO 03/10/2023 (Shift-02)

- (a) 0.35m (b) 0.90 m
(c) 0.75 m (d) 0.25 m

9. What is the HCF of 12, 18 & 42?

12, 18 और 42 संख्याओं का HCF ज्ञात करें।

SSC CPO 03/10/2023 (Shift-3)

- (a) 60 (b) 12
(c) 123 (d) 6

10. The LCM of two prime numbers x and y ($x > y$) is 533. The value of $4y - x$ is:

दो अभाज्य संख्याओं x और y का LCM 533 है, जहाँ $x > y$ । $4y - x$ का मान ज्ञात करें।

SSC CPO 03/10/2023 (Shift-3)

- (a) 11 (b) 21
(c) 18 (d) 23

11. The product of two numbers is 20000. If their LCM is 800, then what is their HCF?

दो संख्याओं का गुणनफल 20000 है और उनका LCM 800 है। इन संख्याओं का HCF ज्ञात करें।

SSC CPO 04/10/2023 (Shift-01)

- (a) 20 (b) 30
(c) 25 (d) 35

12. Let the HCF of m and n be 'a' and let $n = ab$, LCM of m and n is given by:

m और n का HCF 'a' है और $n = ab$ है। m और n का LCM ज्ञात करें।

SSC CPO 04/10/2023 (Shift-01)

- (a) ab (b) am
(c) bm (d) mn

13. Two numbers are in the ratio 12:7. If their HCF is 25, find the numbers.

दो संख्याओं का अनुपात 12:7 है और उनका HCF 25 है। संख्याएँ ज्ञात करें।

SSC CPO 04/10/2023 (Shift-01)

- (a) 300, 50 (b) 225, 135
(c) 300, 175 (d) 175, 120

14. The LCM and HCF of two numbers are 1105 and 5. If the LCM is 17 times the first number, then find the two numbers.

दो संख्याओं का LCM 1105 और HCF 5 है। यदि LCM प्रथम संख्या का 17 गुना है, तो संख्याएँ ज्ञात करें।

SSC CPO 04/10/2023 (Shift-02)

- (a) 55 and 85 (b) 65 and 75
(c) 60 and 80 (d) 65 and 85

15. Find the HCF of 240, 280 and 560.
240, 280 और 560 संख्याओं का HCF ज्ञात करें।

SSC CPO 04/10/2023 (Shift-02)

- (a) 40 (b) 30
(c) 20 (d) 10

16. Which is the smallest natural number that is exactly divisible by each of 96, 108 and 144?

वर्ष 1996 में 75 वर्ष की आयु में निधन हो गई।

SSC CPO 04/10/2023 (Shift-02)

- (a) 1728 (b) 864
(c) 1296 (d) 2592

17. The HCF of 3888 and 3969 is:

दोनों संख्याओं का HCF 27 है।

SSC CPO 04/10/2023 (Shift-02)

- (a) 81 (b) 73
(c) 83 (d) 71

18. A person has three iron bars whose lengths are 20, 30 and 40 metres, respectively. He wants to cut pieces of the same length from each of the three bars. What is the least number of total pieces if he cuts without any wastage?

20 मीटर, 30 मीटर और 40 मीटर लंबाई के तीन लोहे के बरतों से बराबर लंबाई के टुकड़े काटने के लिए कम से कम कुल टुकड़ों की संख्या ज्ञात करें।

SSC CPO 04/10/2023 (Shift-02)

- (a) 9 (b) 10
(c) 8 (d) 11

19. The LCM of two numbers is 660 and their HCF is 5. If one of the numbers is 55, find the other.

दो संख्याओं का LCM 660 है और HCF 5 है। यदि एक संख्या 55 है, तो दूसरी संख्या ज्ञात करें।

SSC CPO 04/10/2023 (Shift-02)

- (a) 12 (b) 275
(c) 110 (d) 60

20. Determine the LCM of two numbers if their HCF is 12 and their ratio is 13 : 15.

दो संख्याओं का HCF 12 है और उनका अनुपात 13:15 है। उनके LCM ज्ञात करें।

SSC CPO 04/10/2023 (Shift-3)

- (a) 2450 (b) 1780
(c) 1890 (d) 2340

21. The least common multiple of 12, 18 and 27 is :

12, 18 और 27 का न्यूनतम समापक 54 है।

SSC CPO 04/10/2023 (Shift-3)

- (a) 216 (b) 54
(c) 27 (d) 108

22. Find the HCF of 78, 84, 90 and 112

SSC CPO 05/10/2023 (Shift-01)

- (a) 7 (b) 1
(c) 5 (d) 2

23. Find the least number which is exactly divisible by 20, 28, 34, 60 and 75.

20, 28, 34, 60 और 75 द्वारा बिल्कुल विभाज्य न्यूनतम संख्या ज्ञात करें।

SSC CPO 05/10/2023 (Shift-01)

- (a) 34500 (b) 35900
(c) 35700 (d) 36220

24. Find the LCM of 73 and 657.

73 और 657 का LCM ज्ञात करें।

SSC CPO 05/10/2023 (Shift-01)

- (a) 146 (b) 657
(c) 365 (d) 73

25. What is the HCF of $(x^6 + 1)$ and $(x^4 - 1)$?

$(x^6 + 1)$ और $(x^4 - 1)$ का HCF ज्ञात करें।

SSC CPO 05/10/2023 (Shift-01)

- (a) $(1 + x^2)$ (b) $(1 + x)$
(c) 1 (d) $(1 - x^2)$

26. Three numbers are in the ratio of 5 : 7 : 9 and their LCM is 34,650. Their HCF is:

तीन संख्याएँ 5:7:9 के अनुपात में हैं और उनका LCM 34,650 है। उनका HCF ज्ञात करें।

SSC CPO 05/10/2023 (Shift-01)

- (a) 110 (b) 315
(c) 99 (d) 55

27. Which is the largest number that divides each of 1036, 1813 and 3885 without leaving any remainder?

1036, 1813 और 3885 को बिना शेष के विभाजित करने वाला सबसे बड़ा संख्या ज्ञात करें।

SSC CPO 05/10/2023 (Shift-01)

- (a) 259 (b) 111
(c) 333 (d) 37

28. The greatest possible length that can be used to measure exactly the lengths of 3 m 15 cm, 5 m, and 6 m 85 cm is:

3 मीटर 15 सेंटीमीटर, 5 मीटर और 6 मीटर 85 सेंटीमीटर की लंबाइयों को बिना शेष के मापने के लिए सबसे अधिक लंबाई ज्ञात करें।

SSC CPO 05/10/2023 (Shift-2)

- (a) 11 cm (b) 7 cm
(c) 9 cm (d) 5 cm

29. The LCM of 96, 132 and 438 is:

96, 132 और 438 का LCM ज्ञात करें।

SSC CPO 05/10/2023 (Shift-2)

- (a) 85046 (b) 67055
(c) 77088 (d) 86084

30. The LCM of $x^2 - 8x + 15$ and $x^2 - 5x + 6$ is:

$x^2 - 8x + 15$ और $x^2 - 5x + 6$ का LCM ज्ञात करें।

SSC CPO 05/10/2023 (Shift-2)

- (a) $(x + 5)(x + 2)(x + 3)$
(b) $(x - 5)(x - 2)(x - 3)$
(c) $(x + 5)(x - 2)(x - 3)$
(d) $(x - 2)(x - 3)^2(x - 5)$

31. What is the LCM of 0.15, 0.18 and 0.45?

0.15, 0.18 और 0.45 का LCM ज्ञात करें।

SSC CPO 05/10/2023 (Shift-2)

- (a) 0.6 (b) 0.9
(c) 0.81 (d) 0.09

32. Find the LCM of 20, 30, 45 and 65.

20, 30, 45 और 65 का LCM ज्ञात करें।

SSC CPO 05/10/2023 (Shift-2)

- (a) 180 (b) 2000
(c) 2240 (d) 2340

33. Find the HCF of 750, 250 and 125.

750, 250 और 125 का HCF ज्ञात करें।

SSC CPO 05/10/2023 (Shift-3)

- (a) 25 (b) 50
(c) 75 (d) 125

34. The LCM of two numbers is five times their HCF. If the product of the two numbers is 20480, then find their HCF and LCM, respectively.

दो संख्याओं का LCM उनके HCF के पांच गुना है। यदि दोनों संख्याओं का गुणनफल 20480 है, तो उनके HCF और LCM ज्ञात करें।

SSC CPO 05/10/2023 (Shift-3)

- (a) 64 & 320 (b) 56 & 280
(c) 48 & 240 (d) 46 & 230

35. If the sum of two numbers is 60 and their HCF and LCM are 5 and 60, respectively, then the sum of the reciprocals of the numbers will be:

दो संख्याओं का योग 60 है और उनका HCF 5 तथा LCM 60 है, तो संख्याओं के व्युत्क्रमों का योग क्या होगा?

SSC CPO 05/10/2023 (Shift-3)

- (a) $\frac{1}{4}$ (b) $\frac{1}{5}$
(c) $\frac{1}{11}$ (d) $\frac{1}{6}$

36. The HCF and LCM of two numbers are 9 and 126, respectively. Find the larger number, if the ratio between the numbers is 2 : 7.

दो संख्याओं का HCF 9 तथा LCM 126 है, यदि संख्याओं का अनुपात 2 : 7 है, तो बड़ी संख्या का मान क्या होगा?

SSC CPO 05/10/2023 (Shift-3)

- (a) 63 (b) 77
(c) 21 (d) 42

37. The LCM of 8, 12 and 18 is:

8, 12 और 18 का LCM क्या है?

SSC CPO 05/10/2023 (Shift-3)

- (a) 24 (b) 72
(c) 80 (d) 36

38. The largest number of four digits that is exactly divisible by 17 and 36 is:

17 और 36 से पूर्णतः विभाज्य सबसे बड़ा चार-अंकीय संख्या क्या है?

SSC CPO 03/10/2023 (Shift-01)

- (a) 8568 (b) 9180
(c) 9792 (d) 7958

39. Find the greatest number which when divides 261, 853 and 1221, leaves a remainder of 5 in each case.

261, 853 और 1221 को भाग देने पर शेष 5 छोड़ने वाली सबसे बड़ी संख्या क्या है?

SSC CPO 03/10/2023 (Shift-02)

- (a) 18 (b) 17
(c) 16 (d) 19

40. The least number which should be added to 1351 so that the sum is exactly divisible by 2, 4, 6 and 8 is:

1351 को जोड़ने पर 2, 4, 6 और 8 से पूर्णतः विभाज्य बनने वाली सबसे छोटी संख्या क्या है?

SSC CPO 03/10/2023 (Shift-3)

- (a) 13 (b) 11
(c) 15 (d) 17

41. If the HCF of 45 and 55 is expressible in the form of $55 \times 5 + 45m$, then what is the value of m ?

45 और 55 का HCF $55 \times 5 + 45m$ के रूप में व्यक्त हो सके, तो m का मान क्या होगा?

SSC CPO 04/10/2023 (Shift-3)

- (a) 5 (b) -6
(c) -5 (d) 6

42. Find the least number which when divided by 4, 9, 12 and 15, leaves the remainder 3 in each case.

4, 9, 12 और 15 से भाग देने पर शेष 3 छोड़ने वाली सबसे छोटी संख्या क्या है?

SSC CPO 04/10/2023 (Shift-3)

- (a) 193 (b) 183
(c) 360 (d) 180

43. What is the smallest perfect square number which is completely divisible by 4, 6, 9, 12 and 15?

4, 6, 9, 12 और 15 से पूर्णतः विभाज्य सबसे छोटी पूर्णवर्ग संख्या क्या है?

SSC CPO 04/10/2023 (Shift-3)

- (a) 900 (b) 961
(c) 784 (d) 841

44. Which of the following numbers leaves the remainder equal to the highest common factor of 6, 8 and 9, when divided by 6, 8 and 9?

6, 8 और 9 का HCF के बराबर शेष छोड़ने वाली संख्या कौन सी है?

SSC CPO 04/10/2023 (Shift-3)

- (a) 506 (b) 575
(c) 291 (d) 433

45. What will be the least number which when doubled will be exactly divisible by 12, 14, 16 and 18?

12, 14, 16 और 18 से पूर्णतः विभाज्य बनने वाली सबसे छोटी संख्या का दोगुना क्या होगा?

SSC CPO 05/10/2023 (Shift-2)

- (a) 636 (b) 226
(c) 428 (d) 504

46. Which of the following is the greatest four-digit number that is divisible by 15, 25, 40, and 75?

15, 25, 40 और 75 से विभाज्य सबसे बड़ा चार-अंकीय संख्या कौन सी है?

SSC CPO 05/10/2023 (Shift-3)

- (a) 9000 (b) 9600
(c) 9500 (d) 9200

47. The least number of five digits which is exactly divisible by 9, 12, 15, 25 and 27 is:

9, 12, 15, 25 और 27 से विभाज्य सबसे छोटी पाँच-अंकीय संख्या क्या है?

SSC CPO 05/10/2023 (Shift-3)

- (a) 10250 (b) 10800
(c) 10600 (d) 10700

48. A number when divided by 15 and 18 every time leaves 3 as a remainder, the least possible number is

15 और 18 से भाग देने पर शेष 3 छोड़ने वाली संख्या का न्यूनतम मान क्या होगा?

SSC CPO 09/11/2022 (Shift-01)

- (a) 83 (b) 103
(c) 39 (d) 93

49. The ratio of two numbers is 4 : 5 and their HCF is 3. What is their LCM?

दो संख्याओं का अनुपात 4 : 5 है और उनका HCF 3 है, तो उनका LCM क्या होगा?

SSC CPO 09/11/2022 (Shift-02)

- (a) 48 (b) 80
(c) 60 (d) 36

50. The least common multiple of a and b is 42. The LCM of $5a$ and $11b$ is:

a और b का LCM 42 है, तो $5a$ और $11b$ का LCM क्या होगा?

SSC CPO 09/11/2022 (Shift-01)

- (a) 2310 (b) 4620
(c) 210 (d) 462

- SSC CPO 10/11/2022 (Shift-02)**

(a) 95 (b) 71
(c) 83 (d) 73

Find the LCM of 25, 30, 50 and 75.

किसी प्रसिद्धी हस्तियों की रोजगारी परखने के लिए एक टीम

SSC CPO 10/11/2022 (Shift-02)

(a) 15.0 (b) 150
(c) 1.50 (d) 75

Find the HCF of 364 and 724.

एक ही हस्तियों की रोजगारी परखने के लिए

SSC CPO 10/11/2022 (Shift-02)

(a) 4 (b) 2
(c) 6 (d) 364

The greatest number of five digits which is divisible by 13, 15, 18 and 21 is:

तब हमें वे वही पत्रों में से दो को चुनना है जो एक ही संख्या के गुणकों में से किसी भी संख्या द्वारा विभाज्य हो सके।

SSC CPO 10/11/2022 (Shift-02)

(a) 99120 (b) 98280
(c) 96840 (d) 95830

Find the greatest number that exactly divides 15, 30 and 40.

एक ही पत्रों में से दो को चुनना है जो एक ही संख्या के गुणकों में से किसी भी संख्या द्वारा विभाज्य हो सके।

SSC CPO 11/11/2022 (Shift-02)

(a) 3 (b) 40
(c) 5 (d) 15

What is the greatest number of six digits, which when divided by each of 16, 24, 72 and 84, leaves the remainder 15?

हमें वे वही पत्रों में से दो को चुनना है जो एक ही संख्या के गुणकों में से किसी भी संख्या द्वारा विभाज्य हो सके।

SSC CPO 10/11/2022 (Shift-03)

(a) 999981 (b) 999951
(c) 999963 (d) 999915

68. The ratio of two numbers is 5 : 7 and their HCF is 3. Their LCM is:
इसके संख्याओं के हलफेरे की गीनी अंशहस्त्र
0' रेपभासी पस्तवर्षी 0' रेखयौस
पस्तवर्षी दरेी' क 2

SSC CPO 10/11/2022 (Shift-03)

- (a) 75 (b) 105
(c) 125 (d) 35

69. The HCF of $\frac{3}{4}$, $\frac{7}{8}$ and $\frac{13}{14}$ is:
 $\frac{3}{4}$, $\frac{7}{8}$ हस्त्र $\frac{13}{14}$ रे पभासी, पस्तवर्षी
द रे अंश

SSC CPO 10/11/2022 (Shift-03)

- (a) $\frac{1}{36}$ (b) $\frac{1}{56}$
(c) $\frac{1}{70}$ (d) $\frac{1}{60}$

70. If the LCM of two numbers a and b is 60 and their HCF is 15. Determine their mean proportion.
द्वी इसके संख्याओं a हस्त्र b रे खयौस
पस्तवर्षी (LCM) एग्री अंशहस्त्र 0' रे पभासी
पस्तवर्षी (HCF) की अंशहस्त्र 0' र
पठे हलफेरे दरेी' क 2

SSC CPO 10/11/2022 (Shift-03)

- (a) 30 (b) 25
(c) 60 (d) 4

71. Find the HCF of $\frac{11}{25}$, $\frac{9}{20}$, $\frac{16}{15}$
and $\frac{10}{33}$.
 $\frac{11}{25}$, $\frac{9}{20}$, $\frac{16}{15}$ हस्त्र $\frac{10}{33}$ पग गगरी दरे
क 2

SSC CPO 10/11/2022 (Shift-03)

- (a) $\frac{1}{3300}$ (b) $\frac{1}{330}$
(c) $\frac{1}{33}$ (d) $\frac{1}{300}$

72. Find the HCF of 69, 96 and 99.
एरुसी रुपी हस्त्र रुपी रे पभासी, पस्तवर्षी
दरेी' क 2

SSC CPO 11/11/2022 (Shift-01)

- (a) 3 (b) 9
(c) 1 (d) 6

73. Find the LCM of 28 and 92.
81 हस्त्र रुपी रे खयौस, पस्तवर्षी दरे
क 2

SSC CPO 11/11/2022 (Shift-01)

- (a) 464 (b) 644
(c) 161 (d) 322

74. What is the LCM of $a^3b - ab^3$, $a^3b^2 - a^2b^3$, $ab(a - b)$?
 $a^3b - ab^3$, $a^3b^2 - a^2b^3$, $ab(a - b)$ रे
खयौस, पस्तवर्षी दरेी' क 2

SSC CPO 11/11/2022 (Shift-02)

- (a) $a^2b^2(a^2 + b^2)$ (b) $a^2b^2(a^2 - b^2)$
(c) $a^2b^3(a^2 + b^2)$ (d) $a^3b^2(a^2 - b^2)$

75. The LCM of two numbers is 840 and their HCF is 7. If one of the numbers is 56, find the other.
इसके संख्याओं रे खग गगरी 840 रे 0' र
पग गगरी रे अंशहस्त्र 7 रे सं रे करी अंशहस्त्र
इस सं रे दरेी' क 2

SSC CPO 11/11/2022 (Shift-02)

- (a) 120 (b) 112
(c) 105 (d) 84

76. The LCM and ratio of three numbers are 1386 and 3:7:11, respectively. The sum of the greatest and least numbers is:
द्वी संख्याओं रे खयौस, पस्तवर्षी हस्त्र
रे संख्याओं रे हलफेरे चपउगी 3:7:11 हस्त्र
1386 रे अंशहस्त्र 3:7:11 हस्त्र 3 रे अंशहस्त्र
संख्याओं रे अंशहस्त्र दरेी' क 2

SSC CPO 11/11/2022 (Shift-03)

- (a) 60 (b) 64
(c) 84 (d) 108

77. The highest common factor of 120, 360 and 210 is:
प्रभागी एग्री हस्त्र प्री रे पभासी, पस्तवर्षी
द रे अंश

SSC CPO 11/11/2022 (Shift-03)

- (a) 12 (b) 30
(c) 3 (d) 15

78. Two numbers are in the ratio 7:11. If their HCF is 28, then the difference between the two numbers is:

- इसके संख्याओं रे हलफेरे 7:11 रे अंशहस्त्र 28
रे पभासी, पस्तवर्षी (HCF) रे अंशहस्त्र
इसके संख्याओं के अंशहस्त्र हलफेरे दरेी' क 2

SSC CPO 23/11/2020 (Shift-1)

- (a) 28 (b) 196
(c) 112 (d) 308

79. What is the least number when divided by 15, 18 and 36 leaves the same remainder 9 in each case and is divisible by 11?

वर्षे अंशहस्त्र 15, 18, 36 रे अंशहस्त्र 9 रे अंशहस्त्र
15, 18, 36 रे अंशहस्त्र 9 रे अंशहस्त्र
तर्ह अंशहस्त्र 11 रे अंशहस्त्र

SSC CPO 23/11/2020 (Shift-1)

- (a) 1269 (b) 1089
(c) 1080 (d) 1071

80. The ratio of two numbers is 7:13 and their HCF is 8. Their LCM is:
इसके संख्याओं रे हलफेरे 7:13 रे अंशहस्त्र
0' रे पग गगरी (HCF) 8 रे अंशहस्त्र 0' रे खग गगरी
(LCM) रे दरेी' क 2

SSC CPO 23/11/2020 (Shift-2)

- (a) 628 (b) 728
(c) 872 (d) 782

81. The least number which is exactly divisible by 5, 6, 8, 10 and 12 is:
वर्षे अंशहस्त्र 5, 6, 8, 10, 12 रे अंशहस्त्र
12 रे अंशहस्त्र 12 रे अंशहस्त्र 12 रे अंशहस्त्र

SSC CPO 23/11/2020 (Shift-2)

- (a) 180 (b) 150
(c) 240 (d) 120

82. The least number which is exactly divisible by 4, 5, 8, 10 and 12 is:
वर्षे अंशहस्त्र 4, 5, 8, 10, 12 रे अंशहस्त्र
12 रे अंशहस्त्र 12 रे अंशहस्त्र 12 रे अंशहस्त्र

SSC CPO 24/11/2020 (Shift-1)

- (a) 150 (b) 240
(c) 180 (d) 120

83. What is the least number of soldiers that can be drawn up in troops of 10, 12, 15, 18 and 20 soldiers, and also in form of a solid square?

0' क संख्या वे 4 6 पी, सं रे दरेी' क
द 4 6 10, 12, 15, 18 हस्त्र 20 रे अंशहस्त्र
वे (अंशहस्त्र 10, 12, 15, 18, 20 रे अंशहस्त्र
द रे रे रे अंशहस्त्र

SSC CPO 24/11/2020 (Shift-2)

- (a) 400 (b) 625
(c) 900 (d) 180

84. The HCF of two numbers is 29, and the other two factors of their LCM are 15 and 13. The largest of the two numbers is:

97. What is the sum of the greatest three digit number and the smallest four digit number such that their HCF is 23?

97. क्या है सबसे बड़े तीन अंकीय संख्या और सबसे छोटी चार अंकीय संख्या का योग जो 23 का HCF है?

SSC CPO 12/12/2019 (Shift-02)

- (a) 2001 (b) 2002
(c) 1984 (d) 1998

98. The LCM of 165, 176, 385 and 495 is k. When k is divided by the HCF of the numbers the quotient is p. What is the value of p?

98. 165, 176, 385 और 495 का LCM k है। जब k को संख्याओं का HCF से विभाजित किया जाता है तो भाजक p है। p का मान क्या है?

SSC CPO 13/12/2019 (Shift-01)

- (a) 2520 (b) 5040
(c) 6720 (d) 3360

99. Let x be the least number when divided by 8, 9, 12, 14 and 36 leaves a remainder 4 in each case, but x is divisible by 11. The sum of the digits of x is.

99. x को 8, 9, 12, 14 और 36 से विभाजित करने पर शेष 4 मिले। x 11 से विभाज्य है। x के अंकों का योग क्या है?

SSC CPO 13/12/2019 (Shift-02)

- (a) 5 (b) 6
(c) 9 (d) 4

100. The sum of two numbers is 1215 and their HCF is 81. If the numbers lies between 500 and 700, then the sum of the reciprocals of the numbers is?

100. दो संख्याओं का योग 1215 है और उनका HCF 81 है। यदि संख्या 500 और 700 के बीच है, तो संख्याओं के व्युत्क्रमों का योग क्या है?

SSC CPO 13/12/2019 (Shift-02)

- (a) $\frac{5}{1512}$ (b) $\frac{5}{378}$
(c) $\frac{5}{702}$ (d) $\frac{5}{1188}$

ANSWER KEY

1.(b)	2.(d)	3.(c)	4.(b)	5.(c)	6.(c)	7.(d)	8.(d)	9.(d)	10.(a)
11.(c)	12.(c)	13.(c)	14.(d)	15.(a)	16.(b)	17.(a)	18.(a)	19.(d)	20.(d)
21.(d)	22.(d)	23.(c)	24.(b)	25.(a)	26.(a)	27.(a)	28.(d)	29.(c)	30.(b)
31.(b)	32.(d)	33.(d)	34.(a)	35.(b)	36.(a)	37.(b)	38.(c)	39.(c)	40.(d)
41.(b)	42.(b)	43.(a)	44.(d)	45.(d)	46.(b)	47.(b)	48.(d)	49.(c)	50.(a)
51.(a)	52.(a)	53.(c)	54.(d)	55.(b)	56.(a)	57.(c)	58.(c)	59.(a)	60.(b)
61.(d)	62.(d)	63.(b)	64.(a)	65.(b)	66.(c)	67.(b)	68.(b)	69.(b)	70.(a)
71.(a)	72.(a)	73.(b)	74.(b)	75.(c)	76.(c)	77.(b)	78.(c)	79.(b)	80.(b)
81.(d)	82.(d)	83.(d)	84.(a)	85.(b)	86.(b)	87.(d)	88.(a)	89.(d)	90.(b)
91.(a)	92.(d)	93.(b)	94.(c)	95.(a)	96.(a)	97.(a)	98.(b)	99.(d)	100.(a)

SOLUTIONS

- | | | |
|--|--|---|
| <p>1. (b) $15 = 3 \times 5$
 $24 = 3 \times 2^3$
 $35 = 5 \times 7$
 $54 = 2 \times 3^3$
 $\text{LCM}(15, 24, 35, 54)$
 $= 2^3 \times 3^3 \times 5 \times 7$
 $= 7560$</p> <p>2. (d) $A : B = 3 : 4$
 Let, the number be $3x$ and $4x$
 ATQ,
 $3x \times 4x = \text{HCF} \times \text{LCM}$
 $\Rightarrow 12x^2 = 2700$
 $\Rightarrow x^2 = 9 \times 25$
 $\Rightarrow x = 15$
 $\therefore \text{Difference} = x = 15$</p> <p>3. (c) $A \times B = 726$
 $\text{HCF} = 11$
 $\text{LCM} = \frac{A \times B}{\text{HCF}}$
 then, $\text{LCM} = \frac{726}{11} = 66$</p> <p>4. (b) Let, the number are $5x$ and $7x$
 ATQ,
 $5x \times 7x = 5 \times 175$
 $x^2 = 25$
 $x = 5$
 $\therefore \text{Larger number} = 7 \times 5$
 $= 35$</p> <p>5. (c) $\text{LCM} \left(\frac{3}{2}, \frac{81}{16}, \frac{9}{8} \right)$
 $= \frac{\text{LCM}(3, 81, 9)}{\text{HCF}(2, 16, 8)} = \frac{81}{2}$</p> <p>6. (c) $\text{LCM} \left(\frac{1}{3}, \frac{3}{5}, \frac{4}{7}, \frac{9}{16} \right)$
 $= \frac{\text{LCM}(1, 3, 4, 9)}{\text{HCF}(3, 5, 7, 16)} = \frac{36}{1} = 36$</p> <p>7. (d) $210 = 2 \times 3 \times 5 \times 7$
 $336 = 2^4 \times 3 \times 7$
 $504 = 2^3 \times 3^2 \times 7$
 $\text{LCM}(210, 336, 504)$
 $\Rightarrow \text{LCM} = 2^4 \times 3^2 \times 5 \times 7$
 $= 5040$</p> | <p>8. (d) $\text{HCF}(6, 5.25, 12.50)$
 $\text{HCF} \left(\frac{600}{100}, \frac{525}{100}, \frac{1250}{100} \right)$
 $\Rightarrow \frac{\text{HCF}(600, 525, 1250)}{\text{LCM}(100, 100, 100)}$
 $600 = 25 \times 24$
 $525 = 25 \times 21$
 $1250 = 25 \times 50$
 $\therefore \text{HCF} = \frac{25}{100} = 0.25$</p> <p>9. (d) $\text{HCF}(12, 18, 42) = 6$</p> <p>10. (a) $\text{LCM}(x, y) = 533$
 since, $\text{HCF}(x, y) = 1$
 $x \times y = 533 = 13 \times 41$
 $\therefore x = 41, y = 13$
 $\Rightarrow 4y - x = 13 \times 4 - 41$
 $= 52 - 41$
 $= 11$</p> <p>11. (c) $I \times II = \text{HCF} \times \text{LCM} = 20000$
 $\text{HCF} = \frac{20000}{800} = 25$</p> <p>12. (c) $\text{HCF}(m, n) = a$
 $n = ab$
 Let, $m = ac$
 $\text{LCM}(m, n) = (ab, ac)$
 $= abc = (ac)b = bm$</p> <p>13. (c) Let, the numbers are $12x$ & $7x$
 $\text{HCF} = x = 25$
 $\therefore \text{Number are} = 12 \times 25 = 300$
 $7 \times 25 = 175$</p> <p>14. (d) $\text{LCM} = 1105, \text{HCF} = 5$
 Also, $1105 = 17A \Rightarrow A = 65$
 $1105 \times 5 = 65 \times B$
 $\therefore B = \frac{1105 \times 5}{65} = 85$
 Hence, Numbers are 65 and 85</p> <p>15. (a) $240 = 2^4 \times 3 \times 5$
 $280 = 2^3 \times 5 \times 7$
 $560 = 2^4 \times 5 \times 7$
 $\text{HCF}(240, 280, 560)$
 $\therefore \text{HCF} = 2^3 \times 5 = 40$</p> <p>16. (b) $96 = 2^5 \times 3$
 $108 = 2^2 \times 3^3$
 $144 = 2^4 \times 3^2$
 $\text{LCM}(96, 108, 144) = 864$
 $\therefore \text{Required number} = (2^5 \times 3^3)$
 $= 32 \times 27 = 864$</p> | <p>17. (a) $\text{HCF}(3888, 3969)$
 $3888 = 2^4 \times 3^5$
 $3969 = 3^4 \times 7^2$
 $\therefore \text{HCF} = 3^4 = 81$</p> <p>18. (a) $\text{HCF}(20, 30, 40) = 10$
 total number of such bars
 $= \frac{20}{10} + \frac{30}{10} + \frac{40}{10}$
 $= 2 + 3 + 4 = 9$</p> <p>19. (d) $\text{LCM} = (660), \text{HCF} = 5$
 $A \times B = \text{HCF} \times \text{LCM}$
 $55 \times B = 5 \times 660$
 $B = 60$</p> <p>20. (d) Let, the numbers are $13x$ and $15x$
 $\text{HCF} = x = 12$
 $\therefore \text{LCM} = 13 \times 15 \times x = 13 \times 15 \times 12$
 $= 2340$</p> <p>21. (d) $\text{LCM}(12, 18, 27)$
 $12 = 3 \times 2^2$
 $18 = 2 \times 3^2$
 $27 = 3^3$
 $\therefore \text{LCM} = 2^2 \times 3^3$
 $= 4 \times 27 = 108$</p> <p>22. (d) $78 = 2 \times 3 \times 13$
 $84 = 2 \times 2 \times 3 \times 7$
 $90 = 2 \times 3 \times 3 \times 5$
 $112 = 2 \times 2 \times 2 \times 2 \times 7$
 $\text{HCF}(78, 84, 90, 112) = 2$</p> <p>23. (c) $\text{LCM}(20, 28, 34, 60, 75)$
 $= 2^2 \times 5 \times 7 \times 17 \times 3 \times 5$
 $= 35700$</p> <p>24. (b) $\text{LCM}(73, 657) = 657$
 $[657 = 73 \times 9]$</p> <p>25. (a) $\text{HCF}[(x^6 + 1), (x^4 - 1)]$
 $x^6 + 1 = (x^2 + 1)(x^4 + 1 - x^2)$
 $x^4 - 1 = (x^2 - 1)(x^2 + 1)$
 $\therefore \text{HCF} = (x^2 + 1)$</p> <p>26. (a) Let, the numbers are $5x, 7x$ & $9x$
 $\text{LCM} = 34650$
 $5 \times 7 \times 9 \times x = 34650$
 $x = 110$
 $\therefore \text{HCF} = 110$</p> <p>27. (a) By difference method-
 $1036, 1813, 3885$
 $\begin{array}{ccc} & 777 & 2072 \\ & \swarrow & \searrow \\ & 1295 & \\ & \swarrow & \searrow \\ & 5 \times 259 & \\ \therefore \text{HCF} & = & 259 \end{array}$</p> |
|--|--|---|

28. (d) Consider,
HCF (315, 500, 685)
 $315 = 3^2 \times 5 \times 7$
 $500 = 2^2 \times 5^3$
 $685 = 5 \times 137$
 $\therefore$ HCF = 5 cm
29. (c) LCM (96, 132, 438)
 $96 = 2^5 \times 3$
 $132 = 2^2 \times 3 \times 11$
 $438 = 2 \times 3 \times 73$
 $\Rightarrow$ LCM = $2^5 \times 3 \times 11 \times 73$
= 77088
30. (b) LCM ($x^2 - 8x + 15$, $x^2 - 5x + 6$) = ?
 $x^2 - 8x + 15 = x^2 - 3x - 5x + 15$
= $x(x - 3) - 5(x - 3)$
= $(x - 5)(x - 3)$
 $x^2 - 5x + 6 = x^2 - 3x - 2x + 6$
 $x(x - 3) - 2(x - 3)$
= $(x - 2)(x - 3)$
 $\therefore$ LCM = $(x - 3)(x - 2)(x - 5)$
31. (b) 0.15, 0.18 and 0.45
$$\text{LCM} \left(\frac{15}{100}, \frac{18}{100}, \frac{45}{100} \right)$$
$$\Rightarrow \text{LCM} = \frac{3 \times 5 \times 2 \times 3}{100}$$
$$= \frac{90}{100} = 0.9$$
32. (d) LCM (20, 30, 45, 65)
= $2^2 \times 5 \times 3 \times 3 \times 13$
= 2340
33. (d) $125 = 5^3$
 $250 = 5^3 \times 2$
 $750 = 2 \times 3 \times 5^3$
HCF (125, 250, 750)
 $\therefore$ HCF = $5^3 = 125$
34. (a) ATQ,
LCM = 5 (HCF)(i)
 $A \times B = 20480 = \text{LCM} \times \text{HCF}$
 $20480 = 5 \times (\text{HCF})^2$
 $4096 = \text{HCF}^2$
 $\therefore$ HCF = 64
 $\therefore$ LCM = $5 \times 64 = 320$
35. (b) $A + B = 60$ (i)
HCF = 5
LCM = 60
 $\therefore A \times B = 5 \times 60 = 300$ (ii)
From equation (i) and (ii)
$$\therefore \frac{1}{A} + \frac{1}{B} = \frac{B+A}{AB} = \frac{60}{300} = \frac{1}{5}$$
36. (a) Let, the numbers are $2x$ & $7x$
HCF = 9, LCM = 126
ATQ,
 $2x \times 7x = 9 \times 126$
 $x = 9$
 $\therefore$ Large number = $9 \times 7 = 63$
37. (b) LCM (8, 12, 18)
 $\Rightarrow 8 \times 3^2 = 72$
38. (c) Since 36 and 17 are co-prime numbers
 $\therefore$ LCM (17, 36) = $36 \times 17 = 612$
Largest number of four digits = 9999
and $9999 = 612 \times 16 + 207$
 $\therefore$ Required number is $9999 - 207 = 9792$
39. (c) Consider,
HCF (261 - 5, 853 - 5, 1221 - 5)
= HCF (256, 848, 1216)
 $256 = 2^8$
 $848 = 2^4 \times 53$
 $1216 = 2^6 \times 19$
 $\therefore$ HCF (256, 848, 1216) = $2^4 = 16$
40. (d) Consider,
LCM (2, 4, 6, 8) = 24
 $1351 = 24 \times 57 - 17$
 $\therefore$ Required number that should be added to 1351 to make it exactly divisible by 24 is '17'.
41. (b) HCF (45, 55) = 5
ATQ,
 $5 = 55 \times 5 + 45m$
 $5 = 275 + 45m$
 $45m = -270$
 $\therefore m = -6$
42. (b) Consider,
LCM(4, 9, 12, 15) = 180
 $\therefore$ Least such number is 183.
43. (a) Consider,
LCM (4, 6, 9, 12, 15) = 180
 $\therefore 180 \times 5 = 900$ is smallest perfect square number
44. (d) HCF (6, 8, 9) = 1
LCM (6, 8, 9) = 72
 $\therefore$ Required number is of the form:-
 $72k + 1$
from given options:-
for $k = 6$
 $\Rightarrow 72 \times 6 + 1 = 433$
45. (d) Consider,
LCM (12, 14, 16, 18) = 1008
 $\therefore$ required number = $\frac{1008}{2} = 504$
46. (b) Consider,
LCM (15, 25, 40, 75) = 600
 $\therefore$ greatest such 4 digit number is:-
(from options, a multiple of 600) = 9600
47. (b) Consider,
LCM (9, 12, 15, 25, 27) = $675 \times 4 = 2700$
Least number of 5 digit = 10000
also, $10000 = 2700 \times 4 - 800$
 $\therefore$ required number = 10800
48. (d) LCM of 15 and 18 = 90
Required Number = $90 + 3 = 93$
49. (c) LCM of numbers = HCF $\times$ [product of ratio]
= $3 \times 4 \times 5 = 60$
50. (a) Given that, LCM of a and b is 42
Hence LCM of $11a$ and $5b$
= $11 \times 5 \times (\text{LCM of } a \text{ and } b)$
= $55 \times 42 = 2310$
51. (a) Let the two numbers be H_a and H_b and their HCF is H .
Given, sum of Numbers = 1224 and HCF = 68
Therefore, $H_a + H_b = 1224$
 $\Rightarrow H(a + b) = 1224$
 $\Rightarrow a + b = \frac{1224}{68}$
 $\Rightarrow a + b = 18$
Now, Assume the such value of a and b whose sum is 18 and HCF is 1.
 $a = 1$ and $b = 17$
 $a = 5$ and $b = 13$
 $a = 7$ and $b = 11$
There are 3 pairs.
52. (a) LCM of numbers = HCF $\times$ [product of ratio]
 $\Rightarrow 336 = \text{HCF} \times [1 \times 3 \times 7]$
 $\Rightarrow \text{HCF} = \frac{336}{21}$
 $\Rightarrow \text{HCF} = 16$
53. (c) Prime Factorization of 960
= $2^6 \times 3 \times 5$
Prime Factorization of 1020
= $2^2 \times 3 \times 5 \times 17$
HCF = $2^2 \times 3 \times 5 = 60$
54. (d) We know,
Product of numbers = LCM $\times$ HCF
 $\Rightarrow x \times y = 441 \times 7$
 $\Rightarrow 49 \times y = 3087$
 $\Rightarrow y = \frac{3087}{49}$
 $\Rightarrow y = 63$

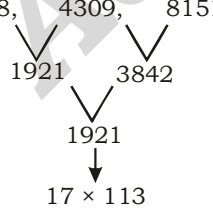
55. (b) Smallest number which is divisible by 12, 16 and 24
 $= \text{LCM}(12, 16 \text{ and } 24) = 48$
 When we divide 550 by 48 we get quotient = 11 remainder = 22
 Thus, The first number greater than 550 which is divisible by 48
 $= 550 + (48 - \text{remainder})$
 $= 550 + 26 = 576$
 Hence, the number which are divisible by 48 and leave remainder 5,
 $1^{\text{st}} \text{ number} = 576 + 5 = 581$
 $2^{\text{nd}} \text{ number} = 576 + 48 = 624 + 5 = 629$
 $3^{\text{rd}} \text{ number} = (576 + 48) + 48 = 672 + 5 = 677$
 $\text{Sum} = 581 + 629 + 677 = 1887$
56. (a) LCM of 15, 24 and 40 = 120
 Largest 4 digit number = 9999
 On dividing 9999 by 120, We get quotient = 83 and remainder = 39
 Hence, Required number
 $= 9999 - 39$
 $= 9960$
- SMART APPROACH:-**
 You can direct check which larger option is completely divisible by 120
57. (c) HCF of the 24, 56 and 96 = 8
 58. (c) Factor of 238 = $2 \times 7 \times 17$
 Factor of 832 = $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 13$
 Therefore, HCF = 2
59. (a) We know that,
 First no. $\times$ second no = LCM $\times$ HCF
 $\Rightarrow 18 \times \text{second no} = 126 \times 9$
 $\Rightarrow \text{Second no} = \frac{126 \times 9}{18}$
 $\Rightarrow \text{Second no} = 63$
60. (b) LCM of 48 and 64 = 192
 HCF of 12 and 18 = 6
 ATQ,
 LCM of 48 and 64 = $m \times \text{HCF of } 12 \text{ and } 18$
 $\Rightarrow 192 = m \times 6$
 $\Rightarrow m = \frac{192}{6}$
 $\Rightarrow m = 32$
61. (d) $108 = 72 \times 1 + 36$
 $72 = 36 \times 2 + 0$
 Hence, $5a = 5 \times 36 = 180$
 Now,
 $108 = 2 \times 2 \times 3 \times 3 \times 3$
 $72 = 2 \times 2 \times 2 \times 3 \times 3$
 $36 = 2 \times 2 \times 3 \times 3$
 $\text{LCM} = 2 \times 2 \times 2 \times 3 \times 3 \times 3$
 $= 216$

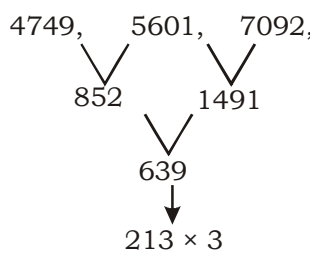
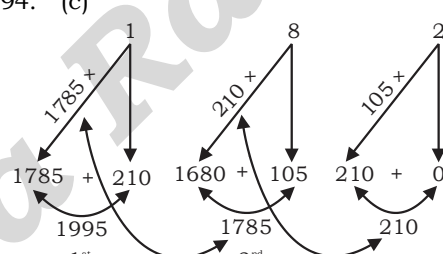
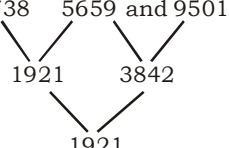
62. (d) $554 - 43 = 511$
 $714 - 57 = 657$
 $213 - 67 = 146$
 Now,
 Prime Factorisation of
 $511 = 7 \times 73$
 $657 = 3 \times 3 \times 73$
 $146 = 2 \times 73$
 Hence, HCF = 73
 Therefore, The greatest positive integer that divides 554, 714 and 213 and leaves the remainder 43, 57, and 67 respectively is 73.
63. (b) Factor of 25 = 5×5
 Factor of 30 = $2 \times 3 \times 5$
 Factor of 50 = $2 \times 5 \times 5$
 Factor of 75 = $3 \times 5 \times 5$
 LCM = $5 \times 5 \times 3 \times 2 = 150$
64. (a) Factor of 364 = $2 \times 2 \times 7 \times 13$
 Factor of 724 = $2 \times 2 \times 181$
 HCF = 4
65. (b) LCM of 13, 15, 18 & 21 = 8190
 Greatest 5 digit number = 99999
 When we divide 99999 by 8190, we get,
 quotient = 12 and remainder = 1719
 Required number = $99999 - 1719$
 $= 98280$
- SMART APPROACH:-**
 We can direct result by divisibility 5 and 9 together only option (b) is correct.
66. (c) $15 = 3 \times 5$
 $30 = 2 \times 3 \times 5$
 $40 = 2 \times 2 \times 2 \times 5$
 HCF = 5
67. (b) LCM of 16, 24, 72 & 84 = 1008
 When we divide largest 6 digit number - 999999 by 1008 we get-remainder = 63
 Largest 6 digit number which is divisible by 1008
 $= 999999 - 63$
 $= 999936$
 Hence, Required Number
 $= 999936 + 15 = 999951$
- SMART APPROACH:-**
 We can direct result by divisibility 4, 8 and 9
 $\therefore 999951 - 15 = 999936$
 Only option (b) is correct.
68. (b) LCM = HCF $\times$ product of ratios
 $= 3 \times 5 \times 7$
 $= 105$
69. (b) HCF of fraction
 $= \frac{\text{HCF of Numerator}}{\text{LCM of Denominator}}$
 $= \frac{\text{HCF}(3, 7, 13)}{\text{LCM}(4, 8, 14)} = \frac{1}{56}$

70. (a) Product = LCM $\times$ HCF
 $\Rightarrow ab = 60 \times 15$
 Mean proportion = $\sqrt{ab}$
 $= \sqrt{60 \times 15} = 30$
71. (a) HCF of fraction
 $= \frac{\text{HCF of Numerator}}{\text{LCM of Denominator}}$
 $= \frac{\text{HCF}(11, 9, 16, 10)}{\text{LCM}(25, 20, 15, 33)} = \frac{1}{3300}$
72. (a) Factor of 69 = 3×23
 Factor of 96
 $= 2 \times 2 \times 2 \times 2 \times 2 \times 3$
 Factor of 99 = $3 \times 3 \times 11$
 HCF = 3
73. (b) Factor of 28 = $2 \times 2 \times 7$
 Factor of 92 = $2 \times 2 \times 23$
 LCM = $2 \times 2 \times 7 \times 23$
 $= 644$
- SMART APPROACH:-**
 Check which option are divisible by 28
74. (b) $a^3b - ab^3 = ab(a^2 - b^2)$
 $a^3b^2 - a^2b^3 = a^2b^2(a - b)$
 $ab(a - b) = ab(a - b)$
 LCM = $a^2b^2(a^2 - b^2)$
75. (c) First number $\times$ second number = LCM $\times$ HCF
 $= 56 \times \text{second number} = 840 \times 7$
 $\Rightarrow \text{Second number} = \frac{840 \times 7}{56}$
 $\Rightarrow \text{Second number} = 105$
76. (c) Let the numbers be $3x$, $7x$ and $11x$.
 Hence, HCF = x
 $\Rightarrow \text{LCM} = \text{HCF} \times \text{product of ratios}$
 $\Rightarrow 1386 = x(3 \times 7 \times 11)$
 $\Rightarrow x = \frac{1386}{3 \times 7 \times 11}$, $x = 6$
 Least Number = $3x$
 Greatest Number = $11x$
 Sum = $14x = 14 \times 6 = 84$
- SMART APPROACH:-**
 Sum of least and greatest ratio
 $= 3 + 11 = 14$ units
 Check which option is multiple of 14 if there is only one multiple this will be the best approach
77. (b) $120 = 2 \times 2 \times 2 \times 3 \times 5$
 $360 = 2 \times 2 \times 2 \times 3 \times 3 \times 5$
 $210 = 2 \times 3 \times 5 \times 7$
 HCF = $2 \times 3 \times 5 = 30$
78. (c) Ratio = 7 : 11, HCF = 28
 Difference = $(11 - 7) \times 28$
 $= 4 \times 28 = 112$

79. (b) (I) LCM of 15, 18, 36 = 180
 Number $\Rightarrow 180 \times k + 9$
 $\therefore k \Rightarrow 6$
 $\Rightarrow 180 \times 6 + 9$
 $\Rightarrow 1089$
 (II) By option
 In option subtract 9 and divide by 15, 18, 36
80. (b) Ratio = 7 : 13, HCF = 8
 LCM = $7 \times 13 \times 8$
 $= 56 \times 13 = 728$
81. (d) 5, 6, 8, 10, 12 $\rightarrow$ LCM = 120
82. (d) LCM of 4, 5, 8, 10, 12
 $\Rightarrow 120$
83. (d) The least number of soldiers = LCM (10, 12, 15, 18, 20) = 180
 Required number = $180 \times 5 = 900$
 Therefore, 900 soldier can be drawn up in form of a square
84. (a) HCF = 29
 The largest Number
 $= 15 \times 29 = 435$
85. (b) The sum of two number
 $= (7 + 11) \times 28 = 18 \times 28 = 504$
- SMART APPROACH:-**
 Divisibility Rule by 9
86. (b) HCF = 29
 The Smallest Number = $29 \times 13 = 377$
- SMART APPROACH:-**
 Divisibility Rule by 13
87. (d) LCM [3, 5, 8, 9, 10]
 $\Rightarrow 360$ seconds
 $\Rightarrow 6$ minutes
 After 6 minutes all the five bells ring together.
88. (a) HCF of $\frac{4}{5}, \frac{6}{8}, \frac{8}{25}$

$$\frac{\text{HCF of Numerator}}{\text{LCM of Denominator}}$$

$$= \frac{\text{HCF of (4, 6, 8)}}{\text{LCM of (5, 8, 25)}} = \frac{2}{200} = \frac{1}{100}$$
89. (d) 2388, 4309, 8151,

 17×113
 Three digit number is = 113
 When we divide 2388, 4309, 8151 by 113 we find remainder 15 in each case
 Remainder = 15

90. (b) LCM of (2, 3, 4, 5, 6, 7) = 420
 $= 420n + 1$
 Put $n = 7$ (Because the x lies between 2800 and 3000)
 $= 420 \times 7 + 1$
 $\Rightarrow 2940 + 1 = 2941$
 The sum of digit = $(2 + 9 + 4 + 1) = 16$
91. (a)

 $d = 213$
 After dividing (4749, 5601, 7092) by 213 in each case get remainder = 63
 Value of $(d + r) = (213 + 63) = 276$
92. (d) LCM of (2, 3, 4, 5, 6, 7) = 420
 $= 420n + 1$
 $= 420 \times 5 + 1$
 $= 2100 + 1 = 2101$
 Sum of digit = $(2 + 1 + 0 + 1) = 4$
93. (b) LCM of (4, 5, 6, 7, 8, 12) = 840
 $= 840n + 2$
 put $n = 3$
 $= 840 \times 3 + 2 = 2522$
 2522 is least number which is divisible by 13
 Sum of digit = $(2 + 5 + 2 + 2) = 11$
94. (c)

 Some of these two number
 $1995 + 1785 = 3780$
95. (a) 3738, 5659 and 9501

 H.C.F of 1921, 3842 and 5763
 $= 1921$
 When 3738, 5659 and 9501 are divided by 1921
 Remainder (y) = 1817
 $\Rightarrow x + y = 1921 + 1817 = 3738$
96. (a) Product = HCF $\times$ LCM
 $\Rightarrow 2x \times 3x = 8 \times 48$
 $\Rightarrow x^2 = 4 \times 16$

$$\Rightarrow x = 8$$

Hence, Largest number

$$= 8 \times 3 = 24$$

97. (a) Greatest 3-digit number is 999
 When 999 is divided by 23, the remainder is 10
 So, the greatest 3-digit number which is divisible by 23
 $= (999 - 10) = 989$
 Now, the smallest 4-digit number is 1000
 When 1000 is divided by 23, the remainder is 11
 So, the smallest 4-digit number which is divisible by 23
 $= 1000 + (23 - 11) = 1012$
 Hence, Sum of both the numbers
 $= 989 + 1012 = 2001$
98. (b) LCM of (165, 176, 385 and 495)
 $= 55440$
 HCF of the number = 11

$$\text{So, } P = \frac{55440}{11} = 5040$$
99. (d) LCM of (8, 9, 12, 14, 36) = 1008
 x be the least number and also divisible by 11

$$= \frac{1008x + 4}{11} \text{ put } x = 1$$

 $= 1008 + 4 = 1012$ (divisible by 11)
 Least number = 1012
 Sum of digit = $(1 + 0 + 1 + 2) = 4$
100. (a) Number be $81x$ and $81y$
 $81x + 81y = 1215$

$$x + y = \frac{1215}{81}$$

 $x + y = 15$
 Possible value of x and y for which $81x$ and $81y$ lies between 500 and 700.
 Hence, sum of reciprocal of the number is

$$\frac{1}{81x} + \frac{1}{81y} = \frac{1}{81} \left(\frac{1}{x} + \frac{1}{y} \right)$$

$$= \frac{1}{81} \left(\frac{1}{7} + \frac{1}{8} \right)$$



SIMPLIFICATION

16

प्रश्नोत्तर

1. The value of /f की कसरा कहस
 $11 \times 11 + 11 \div 11 - 11 \times 11 + 11$
 $+ 11 \times 11 - 11 - 11 \times 11$ is:

SSC CPO 03/10/2023 (Shift-01)

- (a) 121 (b) 0
 (c) 11 (d) 1

2. Evaluate: /f कसनकंसि खै । प

$$\frac{0.04}{0.05} \text{ of } \left(3\frac{1}{3} - 2\frac{1}{2} \right) \div \frac{1}{2} \text{ of } 1\frac{1}{4}$$

$$\frac{1}{3} + \frac{1}{5} \text{ of } \frac{1}{9}$$

SSC CPO 03/10/2023 (Shift-01)

- (a) 5 (b) 3
 (c) 3 (d) 0.03

3. Simplify the given expression/
 य याककंसि फ सि की कसरा कहस

$$\frac{a^2 - b^2 - 2bc - c^2}{a^2 + b^2 + 2ab - c^2}$$

SSC CPO 03/10/2023 (Shift-02)

- (a) $\frac{a-b+c}{a+b+c}$ (b) $\frac{a+b+c}{a-b-c}$
 (c) $\frac{a+b-c}{a-b-c}$ (d) $\frac{a-b-c}{a+b-c}$

4. Evaluate/f की कसनकंसि खै । प

$$6.9 - [8.6 - \{6.5 - (5.4 - 4.3 - 2)\}]$$

SSC CPO 03/10/2023 (Shift-02)

- (a) 1.6 (b) 1.9
 (c) 1.8 (d) 1.7

5. A hostel mess requires 217 eggs for a week. How many eggs will it require in total for the months of July, August and September?

। सि किसे कसि सी बसी स। सि ब्व कसि द
 या। सइ इसर्माव्मि खल्लेकल फि काहकंसहस
 त कृषल्लद, सल्लकसयं न आसि सी हखव्वि द
 या। सी बसी स त ससर् ससर्माव्वि खल्लेकल फि क
 हकंसव्व

SSC CPO 03/10/2023 (Shift-02)

- (a) 2821 (b) 2790
 (c) 2852 (d) 2883

6. What is the value of the given expression/या सल्ल सषै फ सि की कसरा कहस

$$\frac{1}{12} + \frac{1}{16} + \frac{1}{8}$$

SSC CPO 03/10/2023 (Shift-02)

- (a) $\frac{3}{48}$ (b) $\frac{17}{48}$
 (c) $\frac{10}{72}$ (d) $\frac{13}{48}$

7. If $A + \frac{1}{1 + \frac{1}{2 + \frac{1}{3}}} = \frac{9}{10}$, then the value of A is:

$$। अस A + \frac{1}{1 + \frac{1}{2 + \frac{1}{3}}} = \frac{9}{10}, \text{ सहसं कासि क}$$

ी कसरा

SSC CPO 03/10/2023 (Shift-3)

- (a) $\frac{3}{10}$ (b) $\frac{2}{5}$
 (c) $\frac{1}{10}$ (d) $\frac{1}{5}$

8. If $(48 \div 72 \times 3) - [15 \div 8 \times (40 - 32) - 10] + 2P = 6 \div 2$, then find the value of P?

। अस $(48 \div 72 \times 3) - [15 \div 8 \times (40 - 32) - 10] + 2P = 6 \div 2$, सं कासि की कनकंसि खै । ज

SSC CPO 03/10/2023 (Shift-3)

- (a) 2 (b) 4
 (c) 1 (d) 3

9. What should be the value in place of (?) in /f जसि स, व्वसकसस की कसरा कहस। प

$$7\frac{5}{8} + \frac{5}{8} \text{ of } 184 \times 15 \div 5 - (?) = 0$$

SSC CPO 03/10/2023 (Shift-3)

- (a) $152\frac{1}{8}$ (b) $352\frac{5}{8}$
 (c) $-152\frac{1}{8}$ (d) $-352\frac{5}{8}$

10. Simplify/f की कसनकंसि खै । प

$$1 - \frac{3}{7} \div \frac{9}{49} \times \frac{3}{14}$$

$$1 + \frac{3}{5} \div \frac{1}{25} \times \frac{1}{30}$$

SSC CPO 04/10/2023 (Shift-01)

- (a) $\frac{1}{6}$ (b) $\frac{1}{5}$
 (c) $\frac{1}{3}$ (d) $\frac{1}{7}$

11. The square root of /f को लेव सहस

$$\left(\frac{1}{4} \right) \times \left(\frac{1}{9} \right) \times \left(\frac{1}{25} \right) \times \left(\frac{1}{49} \right) \div \left(\frac{36}{121} \right)$$

SSC CPO 04/10/2023 (Shift-01)

- (a) $\frac{11}{12.60}$ (b) $\frac{1}{1260}$
 (c) $\frac{11}{1260}$ (d) $\frac{1260}{11}$

12. Simplify/य सि की कसनकंसि खै । प

$$5\frac{1}{3} - \left\{ 4\frac{1}{3} + \left(3\frac{1}{3} \div 2\frac{1}{3} - \frac{1}{3} \right) \right\}$$

SSC CPO 04/10/2023 (Shift-01)

- (a) $-\frac{2}{3}$ (b) $-\frac{1}{3}$
 (c) $\frac{2}{3}$ (d) $\frac{1}{3}$

13. The value of /f की कसरा कहस

$$1\frac{2}{5} - \left[3\frac{3}{4} + \left\{ 1\frac{1}{4} \div \frac{1}{2} \left(1\frac{1}{2} \times 3\frac{1}{3} + 1\frac{1}{3} \right) \right\} \right] \text{ is}$$

SSC CPO 04/10/2023 (Shift-01)

- (a) 1 (b) 3
 (c) 2 (d) 0

14. The value of /f की कसरा कहस

$$\frac{(157 \times 157) + (157 \times 133) + (133 \times 133)}{(157 \times 157 \times 157) - (133 \times 133 \times 133)}$$

SSC CPO 04/10/2023 (Shift-02)

- (a) 24 (b) $\frac{1}{290}$
 (c) 290 (d) $\frac{1}{24}$

15. Simplify the following/य या कसकसि क
ी कसनकसि छै । प

$$19 \div 5 \text{ of } (27 - 15 - 21) + 37$$

SSC CPO 04/10/2023 (Shift-02)

- (a) $\frac{6142}{165}$ (b) $\frac{6124}{165}$
(c) $\frac{19}{165}$ (d) $\frac{37}{165}$

16. Simplify the given expression/
य या कसकसि फि सि कसि कसि कहकसि

$$\frac{(3.254 \times 3.254 \times 3.254) - (0.746 \times 0.746 \times 0.746)}{(3.254 \times 3.254) + (0.746 \times 0.746) + (3.254 \times 0.746)}$$

SSC CPO 04/10/2023 (Shift-02)

- (a) 2.508 (b) 4.508
(c) 2.146 (d) 3.156

17. The value of/फि कसि कसि

$$\frac{a^2 - (b - c)^2}{(a + c)^2 - b^2} + \frac{b^2 - (a - c)^2}{(a + b)^2 - c^2} + \frac{c^2 - (a - b)^2}{(b + c)^2 - a^2}$$

SSC CPO 04.10.2023 (Shift-3)

- (a) 3 (b) -1
(c) 1 (d) 2

18. If $1\frac{1}{3} \div \frac{2}{5} \times \frac{x}{5} = 1\frac{1}{4} \times \frac{2}{3} \div \frac{1}{6}$, then
the value of x is:

$$1\frac{1}{3} \div \frac{2}{5} \times \frac{x}{5} = 1\frac{1}{4} \times \frac{2}{3} \div \frac{1}{6}, \text{ सँ कसि } x$$

फि कसि कसि

SSC CPO 04/10/2023 (Shift-3)

- (a) 7.0 (b) 5.5
(c) 15 (d) 7.5

19. Simplify the given expression/
या सझि सझि फि सि कसि कसि कहकसि । प

$$(1 + x)^3 + (1 - x)^3 + (-2)^3$$

SSC CPO 04/10/2023 (Shift-3)

- (a) $3(1 - x^2)$ (b) $6(1 - x^2)$
(c) $-6(1 - x^2)$ (d) $-3(1 - x^2)$

20. Simplify the given expression.

$$(1 - 2x)^2 - (1 + 2x)^2$$

SSC CPO 05/10/2023 (Shift-01)

- (a) $-8x$ (b) $8x$
(c) $2 + 8x^2$ (d) $-(2 + 8x^2)$

21. The value of/फि कसि कसि कहकसि छै । प

$$\frac{1\frac{1}{2} \div 3\frac{1}{4} + \frac{1}{2} \div \frac{13}{14} + \frac{1}{5}}{\frac{1}{5} \times 3\frac{1}{2} - \frac{1}{3} \div 1\frac{3}{4} \times 3\frac{1}{2}}$$

SSC CPO 05/10/2023 (Shift-01)

- (a) 38 (b) 33
(c) 36 (d) 40

22. Simplify the following/य या कसकसि क
बअसि छै । प

$$9 \times 2 \div 3 \text{ of } 24 - 3 \div 2 \times (6 - 7) \times 2 + 3 \div 3 \text{ of } 5$$

SSC CPO 05/10/2023 (Shift-2)

- (a) 4 (b) 3
(c) $\frac{69}{20}$ (d) $\frac{9}{20}$

23. Simplify the given expression/या
झि सझि फि सि कसि कहकसि छै । प

$$b + 2a - [(3b + a) - (2a + b) + 2a] - a$$

SSC CPO 05/10/2023 (Shift-3)

- (a) $-a$ (b) $-b$
(c) a (d) b

24. Simplify the given expression/या
झि सझि फि सि कसि कहकसि छै । प

$$(x - 2y)(y - 3x) + (x + y)(x - y) + (x - 3y)(2x + y)$$

SSC CPO 05/10/2023 (Shift-3)

- (a) $2x(x - 3y)$
(b) $2y(x + 3y)$
(c) $2x(x + 3y)$
(d) $2y(x - 3y)$

25. Simplify the following. $19 \div 5 \text{ of } (27 - 15 - 21) \div 37$

$$य या कसकसि कसि कसि कहकसि छै । प$$

$$19 \div 5 \text{ of } (27 - 15 - 21) \div 37$$

SSC CPO 04/10/2023 (Shift-02)

- (a) $\frac{193}{5}$ (b) $\frac{19}{5}$
(c) $\frac{19}{165}$ (d) $\frac{38}{50}$

26. Simplify the following

$$य या कसकसि कहकसि छै । प$$

$$81^{\frac{3}{4}} + [(20 \div 5 \text{ of } 3 \times 6) + \{(8 \div 24$$

$$\text{of } 3) \times 4\} - 10 \div 5] - \left(\frac{1}{32}\right)^{-\frac{2}{5}}$$

SSC CPO 09/11/2022 (Shift-01)

$$(a) 24\frac{1}{4} \quad (b) 21\frac{1}{9}$$

$$(c) 27\frac{4}{5} \quad (d) 29\frac{4}{9}$$

27. The value of/फि कसि कसि कहकसि छै

$$\frac{\sqrt[3]{-2744} \times \sqrt[3]{-216}}{\sqrt[3]{\frac{64}{729}}}$$

SSC CPO 09/11/2022 (Shift-01)

- (a) 164 (b) 512
(c) 189 (d) 156

28. $72 \div 8 \times \{[(57 - 49) \div 2] + \{(85 - 60) \div 5\} - \{(28 - 19) \div 3\}\}$ is equal to:

$$72 \div 8 \times \{[(57 - 49) \div 2] + \{(85 - 60) \div 5\} - \{(28 - 19) \div 3\}\}$$

SSC CPO 09/11/2022 (Shift-02)

- (a) 56 (b) 46
(c) 54 (d) 60

29. The value of 1801×1801 is:

$$1801 \times 1801 \text{ फि कसि कहकसि छै । प}$$

SSC CPO 09/11/2022 (Shift-02)

- (a) 3423601 (b) 3243601
(c) 2343601 (d) 3243106

30. What is the value of 'a' in the below equation?

$$\{(5 \times 5 \times 5 \times 5 \times 5 \times 5 \times 5) \times (5 \times 5 \times 5 \times 5 \times 5)\} \div (5 \times 5) = (625)^a$$

SSC CPO 09/11/2022 (Shift-02)

- (a) 14 (b) 17
(c) 16 (d) 15

31. Solve the following equation.

$$य या कसकसि कहकसि छै । प$$

$$12^3 \times (16^2 - 14^2 - 40) \div 2 - 9^4 = ?$$

SSC CPO 09/11/2022 (Shift-03)

- (a) 17280 (b) 6561
(c) 10719 (d) 986

32. Simplify the following expression.

$$य या कसकसि कहकसि छै । प$$

$$72 - 42 \div 6 \text{ of } 7 \times 4 \text{ of } 3 \div 4 \times 3 - 5$$

SSC CPO 09/11/2022 (Shift-03)

- (a) 32 (b) 16
(c) 58 (d) 45

50. Arrange the given ratios in descending order 15 : 7, 5 : 11 and 21 : 77.

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SSC CPO 11/11/2022 (Shift-02)

- (a) 21 : 77 > 5 : 11 > 15 : 7
(b) 15 : 7 > 5 : 11 > 21 : 77
(c) 15 : 7 > 21 : 77 > 5 : 11
(d) 5 : 11 > 15 : 7 > 21 : 77

51. The value of $\frac{6.35 \times 6.35 \times 6.35 + 3.65 \times 3.65 \times 6.35}{63.5 \times 63.5 + 36.5 \times 36.5 - 63.5 \times 36.5}$

is equal to:

SSC CPO 23/11/2020 (Shift-1)

- (a) 0.01 (b) 10
(c) 1 (d) 0.1

52. The value of $\frac{40 - \frac{3}{4} \text{ of } 32}{37 - \frac{3}{4} \text{ of } (34 - 6)}$

$$\frac{40 - \frac{3}{4} \text{ of } 32}{37 - \frac{3}{4} \text{ of } (34 - 6)}$$

SSC CPO 23/11/2020 (Shift-1)

- (a) 1 (b) 0
(c) $-\frac{1}{2}$ (d) $\frac{1}{2}$

53. The value of $\left(5\frac{1}{4} \div \frac{3}{7} \text{ of } \frac{1}{2}\right) \div \left(5\frac{1}{9} - 7\frac{7}{8} \div 9\frac{9}{20}\right) \times \frac{11}{21} - \left(5 \div 2 \text{ of } \frac{1}{2}\right)$

$$\left(5\frac{1}{4} \div \frac{3}{7} \text{ of } \frac{1}{2}\right) \div \left(5\frac{1}{9} - 7\frac{7}{8} \div 9\frac{9}{20}\right) \times \frac{11}{21} - \left(5 \div 2 \text{ of } \frac{1}{2}\right)$$

SSC CPO 23/11/2020 (Shift-2)

- (a) 0 (b) $\frac{35}{24}$
(c) -2 (d) $\frac{15}{28}$

54. The value of $\frac{0.325 \times 0.325 + 0.175 \times 0.175 + 25 \times 0.00455}{5 \times 0.0065 \times 3.25 - 7 \times 0.175 \times 0.025}$

$$\frac{0.325 \times 0.325 + 0.175 \times 0.175 + 25 \times 0.00455}{5 \times 0.0065 \times 3.25 - 7 \times 0.175 \times 0.025}$$

SSC CPO 23/11/2020 (Shift-2)

- (a) 3 (b) 0
(c) -1 (d) -3

55. The value of $\frac{3\frac{1}{3} \div 2\frac{1}{2} \text{ of } 1\frac{3}{5} + \left(\frac{3}{8} + \frac{1}{7} \times 1\frac{3}{4}\right)}{3\frac{1}{3} \div 2\frac{1}{2} \text{ of } 1\frac{3}{5} + \left(\frac{3}{8} + \frac{1}{7} \times 1\frac{3}{4}\right)}$

$$\frac{3\frac{1}{3} \div 2\frac{1}{2} \text{ of } 1\frac{3}{5} + \left(\frac{3}{8} + \frac{1}{7} \times 1\frac{3}{4}\right)}{3\frac{1}{3} \div 2\frac{1}{2} \text{ of } 1\frac{3}{5} + \left(\frac{3}{8} + \frac{1}{7} \times 1\frac{3}{4}\right)}$$

SSC CPO 23/11/2020 (Shift-2)

- (a) $\frac{55}{24}$ (b) $\frac{25}{24}$
(c) $\frac{35}{24}$ (d) $\frac{5}{24}$

56. The value of $\frac{2\frac{1}{3} \div 2\frac{1}{2} \text{ of } 1\frac{3}{5} + \left(\frac{3}{8} + \frac{1}{7} \times 1\frac{3}{4}\right)}{2\frac{1}{3} \div 2\frac{1}{2} \text{ of } 1\frac{3}{5} + \left(\frac{3}{8} + \frac{1}{7} \times 1\frac{3}{4}\right)}$

$$\frac{2\frac{1}{3} \div 2\frac{1}{2} \text{ of } 1\frac{3}{5} + \left(\frac{3}{8} + \frac{1}{7} \times 1\frac{3}{4}\right)}{2\frac{1}{3} \div 2\frac{1}{2} \text{ of } 1\frac{3}{5} + \left(\frac{3}{8} + \frac{1}{7} \times 1\frac{3}{4}\right)}$$

SSC CPO 24/11/2020 (Shift-1)

- (a) $\frac{29}{24}$ (b) $\frac{25}{24}$
(c) $\frac{5}{24}$ (d) $\frac{35}{24}$

57. The value of $\frac{0.325 \times 0.325 + 0.175 \times 0.175 + 25 \times 0.00455}{5 \times 0.0065 \times 3.25 - 7 \times 0.175 \times 0.025}$

$$\frac{0.325 \times 0.325 + 0.175 \times 0.175 + 25 \times 0.00455}{5 \times 0.0065 \times 3.25 - 7 \times 0.175 \times 0.025}$$

SSC CPO 24/11/2020 (Shift-1)

- (a) $\frac{11}{3}$ (b) 3
(c) 0 (d) $\frac{7}{3}$

58. The value of $\left(5 \div 2 \text{ of } \frac{1}{2}\right) + \left(5\frac{1}{4} \div \frac{3}{7} \text{ of } \frac{1}{2}\right) \div \left(5\frac{1}{9} - 7\frac{7}{8} \div 9\frac{9}{20}\right) \times \frac{11}{21}$

$$\left(5 \div 2 \text{ of } \frac{1}{2}\right) + \left(5\frac{1}{4} \div \frac{3}{7} \text{ of } \frac{1}{2}\right) \div \left(5\frac{1}{9} - 7\frac{7}{8} \div 9\frac{9}{20}\right) \times \frac{11}{21}$$

SSC CPO 24/11/2020 (Shift-1)

- (a) $\frac{35}{24}$ (b) $\frac{15}{28}$
(c) -2 (d) 8

59. The value of $\frac{4.35 \times 4.35 \times 4.35 + 3.25 \times 3.25 \times 3.25}{43.5 \times 43.5 + 32.5 \times 32.5 - 43.5 \times 32.5}$

$$\frac{4.35 \times 4.35 \times 4.35 + 3.25 \times 3.25 \times 3.25}{43.5 \times 43.5 + 32.5 \times 32.5 - 43.5 \times 32.5}$$

SSC CPO 24/11/2020 (Shift-2)

- (a) 0.0076 (b) 0.76
(c) 0.076 (d) 7.6

60. The value of $\frac{2}{3} \div \frac{3}{10} \text{ of } \frac{4}{9} - \frac{4}{5} \times 1\frac{1}{9} \div \frac{8}{15} - \frac{3}{4} + \frac{3}{4} \div \frac{1}{2}$

$$\frac{2}{3} \div \frac{3}{10} \text{ of } \frac{4}{9} - \frac{4}{5} \times 1\frac{1}{9} \div \frac{8}{15} - \frac{3}{4} + \frac{3}{4} \div \frac{1}{2}$$

SSC CPO 24/11/2020 (Shift-2)

- (a) $\frac{25}{6}$ (b) $\frac{14}{3}$
(c) $\frac{17}{9}$ (d) $\frac{49}{12}$

61. The value of $-7 \div [5 + 1 \div 2 - \{4 + (4 \text{ of } 2 \div 4) + (4 \div 4 \text{ of } 2)\}]$

$$-7 \div [5 + 1 \div 2 - \{4 + (4 \text{ of } 2 \div 4) + (4 \div 4 \text{ of } 2)\}]$$

SSC CPO 24/11/2020 (Shift-2)

- (a) $-\frac{7}{2}$ (b) -7
(c) $\frac{7}{2}$ (d) 7

62. The value of $\frac{40 + \frac{3}{4} \text{ of } 32}{37 + \frac{3}{4} \text{ of } (34 - 6)}$

$$\frac{40 + \frac{3}{4} \text{ of } 32}{37 + \frac{3}{4} \text{ of } (34 - 6)}$$

SSC CPO 25/11/2020 (Shift-1)

- (a) $-1\frac{3}{29}$ (b) $1\frac{9}{29}$
(c) $2\frac{3}{29}$ (d) $1\frac{3}{29}$

63. The value of $\frac{5.35 \times 5.35 \times 5.35 + 3.65 \times 3.65 \times 3.65}{53.5 \times 53.5 + 36.5 \times 36.5 - 53.5 \times 36.5}$

$$\frac{5.35 \times 5.35 \times 5.35 + 3.65 \times 3.65 \times 3.65}{53.5 \times 53.5 + 36.5 \times 36.5 - 53.5 \times 36.5}$$

SSC CPO 25/11/2020 (Shift-1)

- (a) 0.9 (b) 90
(c) 0.09 (d) 9

64. The value of $1 - 3 \div 6 \text{ of } 2 + \left(4 \div 4 \text{ of } \frac{1}{4}\right) \div 8 + \left(4 \times 8 \div \frac{1}{4}\right) \times \frac{1}{8}$

$$1 - 3 \div 6 \text{ of } 2 + \left(4 \div 4 \text{ of } \frac{1}{4}\right) \div 8 + \left(4 \times 8 \div \frac{1}{4}\right) \times \frac{1}{8}$$

SSC CPO 25/11/2020 (Shift-1)

- (a) $\frac{69}{4}$ (b) $-\frac{7}{4}$
(c) $-\frac{69}{4}$ (d) $\frac{7}{4}$

65. The value of $\frac{427 \times 427 \times 427 + 325 \times 325 \times 325}{42.7 \times 42.7 + 32.5 \times 32.5 - 42.7 \times 32.5}$

$$\frac{427 \times 427 \times 427 + 325 \times 325 \times 325}{42.7 \times 42.7 + 32.5 \times 32.5 - 42.7 \times 32.5}$$

SSC CPO 25/11/2020 (Shift-2)

- (a) 75200 (b) 75.2
(c) 7520 (d) 752

66. The value of $7 \div [5 + 1 \div 2 - \{4 + (4 \text{ of } 2 \div 4) + (5 \div 5 \text{ of } 2)\}]$

$$7 \div [5 + 1 \div 2 - \{4 + (4 \text{ of } 2 \div 4) + (5 \div 5 \text{ of } 2)\}]$$

SSC CPO 25/11/2020 (Shift-2)

- (a) $\frac{7}{2}$ (b) -7
(c) $-\frac{7}{2}$ (d) 7

67. If $(320 + 342 + 530 + 915) \div (20 + 22 - x + 18) = 43$, then the value of x is:

$$(320 + 342 + 530 + 915) \div (20 + 22 - x + 18) = 43$$

SSC CPO 09/12/2019 (Shift-01)

- (a) 15 (b) 11
(c) 26 (d) 23

$$\left(1 - \frac{1}{4 - \frac{2}{1 + \frac{1}{\frac{1}{3} + 2}}}\right) \times \frac{15}{16} \div \frac{2}{3} \text{ of } 2\frac{1}{4} - \frac{3+4}{3^3+4^3}$$
$$7\frac{1}{3} \div 2\frac{1}{2} \text{ of } 1\frac{3}{5} - \left(\frac{3}{8} + \frac{1}{7} \times 1\frac{3}{4} \right) - \frac{5}{24}$$
$$\left\{ \frac{1}{8} \left(x + \frac{1}{y} \right)^2 - \left(x - \frac{1}{y} \right)^2 \right\}$$

$\frac{1}{\sqrt{7-4\sqrt{3}}}$ से वी कसो रीखखि बरिखि धी
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$$\left(5\frac{1}{4} \div \frac{3}{7} \text{ of } \frac{1}{2}\right) \div \left(5\frac{1}{9} - 7\frac{7}{8} \div 9\frac{9}{20}\right) \times \frac{11}{21} + \left(2 \div 2 \text{ of } \frac{1}{2}\right)$$
$$\frac{0.74 \times 1.23 \times 0.13}{(0.37)^3 + (0.41)^3 - 8(0.39)^3}$$
$$\frac{\sqrt{0.6912} + \sqrt{0.5292}}{\sqrt{0.6912} - \sqrt{0.5292}}$$
$$\frac{5 - [2 + 3(2 - 2 \times 2 + 5) - 5] \div 5}{4 \times 4 \div 4 \text{ of } (4 + 4 \div 4 \text{ of } 4)}$$
$$\frac{4.669 \times 4.669 - 9 \times (0.777)^2}{(4.669)^2 + (2.331)^2 + 14(0.667)(2.331)}$$
$$\frac{\frac{1}{3} + \left[4\frac{3}{4} - \left(3\frac{1}{6} - 2\frac{1}{3} \right) \right]}{\left(\frac{1}{5} \text{ of } \frac{1}{5} \div \frac{1}{5} \right) \div \left(\frac{1}{5} \div \frac{1}{5} \times \frac{1}{5} \right)} \text{ lies be-}$$

Selected प्रSelection तथा लार्ने 131

82. The value of $\sqrt{11+2\sqrt{18}}$ is closest to:

$\sqrt{11+2\sqrt{18}}$ का मान निकालें।

SSC CPO 11/12/2019 (Shift-02)

- (a) 4.8 (b) 4.4
(c) 3.8 (d) 4.1

83. The value of $9 \times [(9-4) \div \{(8 \div 8 \text{ of } 4) + (4 \div 4 \text{ of } 2)\}]$ is: /f की कसकसी है। प

SSC CPO 11/12/2019 (Shift-02)

- (a) 20 (b) 60
(c) $\frac{15}{4}$ (d) $\frac{15}{2}$

84. The value of $\frac{(0.13)^2 + (0.21)^2}{(0.39)^2 + 81(0.07)^2}$

$\div \frac{(2.4)^4 + 3 \times (11.52) + 9}{(2.4)^6 + 6(2.4)^4 + 3 \times (17.28)}$ lies between: /f की कसकसी है। प

SSC CPO 12/12/2019 (Shift-01)

- (a) 0.7 and 0.8 (b) 0.4 and 0.5
(c) 0.6 and 0.7 (d) 0.5 and 0.6

85. The value of $8 \div [(9-5) \div \{(4 \div 2 \text{ of } 4) - (8 \div 8 \text{ of } 16) + (4 \times 2 \div 8)\}]$ is: /f की कसकसी है। प

SSC CPO 12/12/2019 (Shift-01)

- (a) $\frac{21}{8}$ (b) $\frac{23}{8}$
(c) $\frac{12}{23}$ (d) $\frac{32}{23}$

86. The value of /f की कसकसी है। प

$\left(3\frac{1}{3} - 2\frac{1}{2}\right) \div \frac{1}{4} \text{ of } 1\frac{1}{4}$ of $\frac{4}{15} \div \frac{1}{3} \div \frac{1}{3}$ of $\frac{1}{9}$
 $\frac{3}{10} + \frac{1}{6} \times \frac{1}{3}$

SSC CPO 12/12/2019 (Shift-01)

- (a) $\frac{4}{81}$ (b) $\frac{2}{9}$
(c) $\frac{9}{2}$ (d) $\frac{27}{8}$

87. The value of $\sqrt{6-\sqrt{17-2\sqrt{72}}}$ is closest to:

$\sqrt{6-\sqrt{17-2\sqrt{72}}}$ का मान निकालें।

SSC CPO 12/12/2019 (Shift-01)

- (a) 2.1 (b) 2.4
(c) 2.7 (d) 1.7

88. If $\sqrt{0.00576 \times y} = 2.4$, then y is equal to:

$\sqrt{0.00576 \times y} = 2.4$ है, तो y का मान निकालें।

SSC CPO 12/12/2019 (Shift-02)

- (a) 3600 (b) 1200
(c) 1000 (d) 2400

89. The value of /f की कसकसी है। प

$\frac{(2.8)^3 + (2.2)^3}{(28)^2 - 28 \times 22 + 484}$

SSC CPO 12/12/2019 (Shift-02)

- (a) 0.02 (b) 0.05
(c) 0.01 (d) 0.5

90. The value of /f की कसकसी है। प

$\frac{17.35 + \frac{7}{4} \text{ of } 55 - 7}{(42 \div 6 \times 8.35) - \frac{3}{7} \text{ of } \left(\frac{2}{3} - \frac{1}{5}\right) + [291 \div (80 \div 8)]}$

SSC CPO 12/12/2019 (Shift-02)

- (a) 2 (b) 4
(c) 1 (d) 3

91. The value of /f की कसकसी है। प

$\frac{56 + \frac{2}{3} \text{ of } 27 - 8}{15 - \frac{3}{8} \text{ of } (29 - 14)}$

SSC CPO 12/12/2019 (Shift-02)

- (a) 12 (b) 10
(c) 15 (d) 11

92. The value of /f की कसकसी है। प

$\frac{(0.321)^3 + (0.456)^3 - (0.777)^3}{0.9 \times (0.107)(0.76)(0.777)}$

SSC CPO 13/12/2019 (Shift-01)

- (a) 60 (b) -6
(c) -3 (d) 30

93. The value of /f की कसकसी है। प

$\frac{5 - 2 \div 4 \times [5 - (3 - 4)] + 5 \times 4 \div 2 \text{ of } 4}{4 + 4 \div 8 \text{ of } 2 \times (8 - 5) \times 2 \div 3 - 8 \div 2 \text{ of } 8}$

SSC CPO 13/12/2019 (Shift-01)

- (a) $\frac{9}{8}$ (b) $\frac{9}{4}$
(c) $\frac{15}{32}$ (d) $\frac{89}{4}$

94. A student was asked to find the value of

$\left(2\frac{1}{3} + 2\frac{1}{2} - \frac{1}{6}\right) \div 2\frac{1}{3} \times 5\frac{2}{3} \div 1\frac{2}{3} \text{ of } 4\frac{1}{4}$
 $3\frac{1}{5} \div 4\frac{1}{2} \text{ of } 5\frac{1}{3} + 5\frac{1}{3} \times \frac{3}{4} \div 2\frac{2}{3}$

His answer was $\frac{6}{7}$. What is the difference between the correct answer and his answer?

।। से ये प्रश्न का उत्तर है।

$\left(2\frac{1}{3} + 2\frac{1}{2} - \frac{1}{6}\right) \div 2\frac{1}{3} \times 5\frac{2}{3} \div 1\frac{2}{3} \text{ of } 4\frac{1}{4}$
 $3\frac{1}{5} \div 4\frac{1}{2} \text{ of } 5\frac{1}{3} + 5\frac{1}{3} \times \frac{3}{4} \div 2\frac{2}{3}$

।। की कसकसी है। प

नहीं कि- $\frac{6}{7}$ सही उत्तर है।

नहीं कि- $\frac{6}{7}$ सही उत्तर है।

SSC CPO 13/12/2019 (Shift-01)

- (a) $\frac{9}{4}$ (b) $\frac{5}{14}$

- (c) $\frac{11}{49}$ (d) $\frac{6}{49}$

95. The value of /f की कसकसी है। प

$\frac{4 - 3 \div 2 \times (4 - 2) - 3 + 4 \times 3 \div 2 + 4}{4 + 3 \div 4 \times (2 - 4) \times 4 + 3 \div 4 \text{ of } 3}$

SSC CPO 13/12/2019 (Shift-02)

- (a) $\frac{32}{7}$ (b) -32

- (c) $\frac{-32}{7}$ (d) 32

96. The value of /f की कसकसी है। प

$\frac{(0.013)^3 + (0.007)(0.000049)}{(0.007)^2 + 0.013(0.013 - 0.007)}$

SSC CPO 13/12/2019 (Shift-02)

- (a) 0.07 (b) 0.02
(c) 0.06 (d) 0.04

97. The value of

$\left(1\frac{1}{9} \times 1\frac{1}{20} \div \frac{21}{38} - \frac{1}{3}\right) \div \left(2\frac{4}{9} \div 1\frac{7}{15} \text{ of } \frac{3}{5}\right)$
 $\frac{1}{5} \text{ of } \frac{1}{5} \div \frac{1}{125} - \frac{1}{25} \div \frac{1}{5} \text{ of } \frac{1}{5}$

lies between /f की कसकसी है। प

SSC CPO 13/12/2019 (Shift-02)

- (a) 0.15 and 0.2 (b) 0.2 and 0.25
(c) 0.1 and 0.15 (d) 0.25 and 0.3

98. Which one among the following is the smallest?

यों में से सबसे छोटा कौन सा है?

SSC CPO 09/12/2019 (Shift-01)

- (a) $\sqrt{101} - \sqrt{99}$ (b) $\sqrt{201} - \sqrt{199}$
(c) $\sqrt{301} - \sqrt{299}$ (d) $\sqrt{401} - \sqrt{399}$

99. The value of $\sqrt{9-2\sqrt{11-6\sqrt{2}}}$ is closest to: /f की कसकसी है। प

SSC CPO 13/12/2019 (Shift-01)

- (a) 2.7 (b) 2.9
(c) 2.4 (d) 2.1

100. The value of $\frac{1}{\sqrt{17+12\sqrt{2}}}$ is closest to: /f की कसकसी है। प

SSC CPO 13/12/2019 (Shift-02)

- (a) 1.2
(b) 0.14
(c) 1.4
(d) 0.17

ANSWER KEY

1.(d)	2.(c)	3.(d)	4.(d)	5.(c)	6.(d)	7.(d)	8.(d)	9.(b)	10.(c)
11.(c)	12.(a)	13.(a)	14.(d)	15.(b)	16.(a)	17.(c)	18.(d)	19.(c)	20.(a)
21.(c)	22.(c)	23.(b)	24.(d)	25.(b)	26.(d)	27.(c)	28.(c)	29.(b)	30.(b)
31.(c)	32.(c)	33.(d)	34.(a)	35.(a)	36.(a)	37.(a)	38.(c)	39.(c)	40.(c)
41.(c)	42.(c)	43.(b)	44.(c)	45.(a)	46.(b)	47.(d)	48.(d)	49.(d)	50.(b)
51.(d)	52.(a)	53.(c)	54.(a)	55.(c)	56.(a)	57.(a)	58.(d)	59.(c)	60.(d)
61.(d)	62.(d)	63.(c)	64.(a)	65.(a)	66.(b)	67.(b)	68.(b)	69.(a)	70.(a)
71.(c)	72.(d)	73.(a)	74.(c)	75.(b)	76.(a)	77.(c)	78.(a)	79.(a)	80.(a)
81.(b)	82.(b)	83.(b)	84.(c)	85.(b)	86.(a)	87.(b)	88.(c)	89.(b)	90.(c)
91.(d)	92.(b)	93.(a)	94.(d)	95.(c)	96.(b)	97.(a)	98.(d)	99.(c)	100.(d)

SOLUTIONS

1. (d) $11 \times 11 + 11 \div 11 - 11 \times 11 + 11 + 11 \times 11 - 11 - 11 \times 11$
 $= 121 + 1 - 121 + 11 + 121 - 11 - 121 = 1$

2. (c)

$$\frac{0.04}{0.05} \text{ of } \left(3\frac{1}{3} - 2\frac{1}{2} \right) \div \frac{1}{2} \text{ of } 1\frac{1}{4}$$

$$= \frac{4}{5} \text{ of } \left(\frac{10}{3} - \frac{5}{2} \right) \div \frac{1}{2} \text{ of } \frac{5}{4}$$

$$= \frac{4}{5} \text{ of } \frac{\frac{5}{6} \div \frac{5}{8}}{\frac{1}{3} + \frac{1}{45}} = \frac{4}{5} \text{ of } \frac{4}{3} \times \frac{45}{16}$$

$$= \frac{4}{5} \text{ of } \frac{15}{4} = 3$$

3. (d) $\frac{a^2 - b^2 - 2bc - c^2}{a^2 + b^2 + 2ab - c^2} = \frac{a^2 - (b+c)^2}{(a+b)^2 - c^2}$

$$= \frac{[a - (b+c)][a + b + c]}{[(a+b-c)][a + b + c]} = \frac{a - b - c}{a + b - c}$$

4. (d) $6.9 - [8.6 - \{6.5 - (5.4 - 4.3 - 2)\}]$
 $= 6.9 - [8.6 - \{6.5 - (5.4 - 2.3)\}]$

$$= 6.9 - [8.6 - \{6.5 - 3.1\}]$$

$$= 6.9 - [8.6 - 3.4]$$

$$= 6.9 - 5.2 = 1.7$$

5. (c) 7 → 217 eggs

total days in July, Aug and Sept.

$$\Rightarrow 31 + 31 + 30 = 92$$

ATQ,

$$\frac{217}{7} \times 92 = 2852$$

6. (d) $\frac{1}{12} + \frac{1}{16} + \frac{1}{8}$

$$\Rightarrow \frac{4+3+6}{16 \times 3} = \frac{13}{48}$$

7. (d) $A + \frac{1}{1 + \frac{1}{2 + \frac{1}{3}}} = \frac{9}{10}$

$$\Rightarrow A + \frac{1}{1 + \frac{3}{7}} = \frac{9}{10}$$

$$\Rightarrow A + \frac{7}{10} = \frac{9}{10}$$

$$\Rightarrow A = \frac{2}{10} = \frac{1}{5}$$

8. (d) $(48 \div 72 \times 3) - [15 \div 8 \times (40 - 32) - 10] + 2P = 6 \div 2$

$$\Rightarrow \left(\frac{2}{3} \times 3 \right) - \left[\frac{15}{8} \times 8 - 10 \right] + 2P = 3$$

$$\Rightarrow 2 - 5 + 2P = 3$$

$$\Rightarrow 2P = 6$$

$$\Rightarrow P = 3$$

9. (b) Let, ? = x

$$7\frac{5}{8} + \frac{5}{8} \text{ of } 184 \times 15 \div 5 - x = 0$$

$$\Rightarrow 7\frac{5}{8} + (5 \times 23) \times \frac{15}{5} - x = 0$$

$$\Rightarrow 7\frac{5}{8} + 345 - x = 0$$

$$\Rightarrow 7 + \frac{5}{8} + 345 - x = 0$$

$$\Rightarrow 352\frac{5}{8} - x = 0$$

$$x = 352\frac{5}{8}$$

$$10. (c) \frac{1 - \frac{3}{7} \div \frac{9}{49} \times \frac{3}{14}}{1 + \frac{3}{5} \div \frac{1}{25} \times \frac{1}{30}}$$

$$= \frac{1 - \frac{3}{7} \times \frac{49}{9} \times \frac{3}{14}}{1 + \frac{3}{5} \times \frac{25}{1} \times \frac{1}{30}} = \frac{1 - \frac{1}{2} = \frac{1}{2}}{1 + \frac{1}{2} = \frac{3}{2}} = \frac{1}{3}$$

$$11. (c) \sqrt{\frac{1}{4} \times \frac{1}{9} \times \frac{1}{25} \times \frac{1}{49} \div \frac{36}{121}}$$

$$= \frac{1}{2} \times \frac{1}{3} \times \frac{1}{5} \times \frac{1}{7} \times \frac{11}{6} = \frac{11}{1260}$$

$$12. (a) 5\frac{1}{3} - \left\{ 4\frac{1}{3} + \left(3\frac{1}{3} \div 2\frac{1}{3} - \frac{1}{3} \right) \right\}$$

$$= \frac{16}{3} - \left\{ \frac{13}{3} + \left(\frac{10}{3} \div \frac{7}{3} - \frac{1}{3} \right) \right\}$$

$$= \frac{16}{3} - \left\{ \frac{13}{3} + \left(\frac{10}{3} \div 2 \right) \right\}$$

$$= \frac{16}{3} - \left\{ \frac{13}{3} + \frac{5}{3} \right\} = \frac{16}{3} - \frac{18}{3} = \frac{-2}{3}$$

$$13. (a) 1\frac{2}{5} - \left[3\frac{3}{4} + \left\{ 1\frac{1}{4} \div \frac{1}{2} \left(1\frac{1}{2} \times 3\frac{1}{3} \div 1\frac{1}{3} \right) \right\} \right]$$

$$= \frac{7}{5} - \left[\frac{15}{4} + \left\{ \frac{5}{4} \div \frac{1}{2} \left(\frac{3}{2} \times \frac{10}{3} \div \frac{4}{3} \right) \right\} \right]$$

$$= \frac{7}{5} - \left[\frac{15}{4} + \left\{ \frac{5}{4} \div \frac{1}{2} \left(\frac{3}{2} \times \frac{10}{3} \times \frac{3}{4} \right) \right\} \right]$$

$$= \frac{7}{5} - \left[\frac{15}{4} + \left\{ \frac{5}{4} \div \frac{1}{2} \times \frac{15}{4} \right\} \right]$$

$$= \frac{7}{5} - \left[\frac{15}{4} + \left\{ \frac{5}{2} \times \frac{15}{4} \right\} \right]$$

$$= \frac{7}{5} - \left[\frac{15}{4} + \frac{75}{8} \right] = \frac{7}{5} - \frac{2}{5} = \frac{5}{5} = 1$$

$$14. (d) \therefore \frac{a^2 + ab + b^2}{a^3 - b^3} = \frac{a^2 + b^2 + ab}{(a - b)(a^2 + b^2 + ab)}$$

$$= \frac{1}{a - b}$$

$$\therefore \frac{(157 \times 157) + (157 \times 133) + (133 \times 133)}{(157 \times 157) - (133 \times 133 \times 133)}$$

$$= \frac{1}{157 - 133} = \frac{1}{24}$$

$$15. (b) 19 \div 5 \text{ of } (27 - \overline{15 - 21}) + 37$$

$$= 19 \div 5 \text{ of } (27 + 6) + 37$$

$$= 19 \div 5 \text{ of } (33) + 37$$

$$= 19 \div 165 + 37$$

$$= \frac{19}{165} + 37$$

$$= \frac{6124}{165}$$

$$16. (a) \frac{(3.254 \times 3.254 \times 3.254) - (0.746 \times 0.746 \times 0.746)}{(3.254 \times 3.254) + (0.746 \times 0.746) + (3.254 \times 0.746)}$$

$$\therefore \frac{a^3 - b^3}{a^2 + b^2 + ab} = a - b$$

$$\Rightarrow 3.254 - 0.746 = 2.508$$

$$17. (c) \frac{a^2 - (b - c)^2}{(a + c)^2 - b^2} + \frac{b^2 - (a - c)^2}{(a + b)^2 - c^2} + \frac{c^2 - (a - b)^2}{(b + c)^2 - a^2}$$

$$= \frac{a + b - c}{a + b + c} + \frac{b - a + c}{a + b + c} + \frac{c + a - b}{a + b + c}$$

$$= \frac{a + b - c + b - a + c + c + a - b}{a + b + c}$$

$$= \frac{a + b + c}{a + b + c} = 1$$

$$18. (d) \frac{4}{3} \div \frac{2}{5} \times \frac{x}{5} = \frac{5}{4} \times \frac{2}{3} \div \frac{1}{6}$$

$$\Rightarrow \frac{4}{3} \times \frac{5}{2} \times \frac{x}{5} = \frac{5}{4} \times \frac{2}{3} \times \frac{6}{1}$$

$$\Rightarrow \frac{2}{3} \times x = 5$$

$$\Rightarrow x = \frac{15}{2} = 7.5$$

$$19. (c) \text{ If } a + b + c = 0$$

then,

$$a^3 + b^3 + c^3 = 3abc$$

$$\therefore (1 + x)^3 + (1 - x)^3 + (-2)^3$$

$$= 3(1 + x)(1 - x)(-2) = -6(1 - x^2)$$

$$20. (a) \therefore [(a - b)^2 - (a + b)^2] = -4ab$$

$$\therefore (1 - 2x)^2 - (1 + 2x)^2$$

$$= -4 \times 1 \times 2x = -8x$$

$$21. (c) \frac{1\frac{1}{2} \div 3\frac{1}{4} + \frac{1}{2} \div \frac{13}{14} + \frac{1}{5}}{\frac{1}{5} \times 3\frac{1}{2} - \frac{1}{3} + 1\frac{3}{4} \times 3\frac{1}{2}}$$

$$= \frac{\frac{3}{2} \times \frac{4}{13} + \frac{1}{2} \times \frac{14}{13} + \frac{1}{5}}{\frac{1}{5} \times \frac{7}{2} - \frac{1}{3} + \frac{4}{7} \times \frac{7}{2}}$$

$$= \frac{\frac{6}{13} + \frac{7}{13} + \frac{1}{5}}{\frac{7}{10} - \frac{1}{3} + \frac{6}{30}} = \frac{\frac{5}{13}}{\frac{1}{30}} = 36$$

$$22. (c) 9 \times 2 \div 3 \text{ of } 24 - 3 \div 2 \times (6 - 7)$$

$$\times 2 + 3 \div 3 \text{ of } 5$$

$$= 9 \times 2 \div 72 - \frac{3}{2} \times (-1) \times 2 + 3 \div 15$$

$$= 9 \times \frac{2}{72} + 3 + \frac{3}{15}$$

$$= \frac{1}{4} + 3 + \frac{1}{5}$$

$$= \frac{5 + 60 + 4}{20} = \frac{69}{20}$$

$$23. (b) b + 2a - [(3b + a) - (2a + b) + 2a] - a$$

$$= b + 2a - [3b + a - 2a - b + 2a] - a$$

$$= b + 2a - [2b + a] - a$$

$$= b + 2a - 2b - a - a = -b$$

$$24. (d) (x - 2y)(y - 3x) + (x + y)(x - y) + (x - 3y)(2x + y)$$

$$\Rightarrow 7xy - 3x^2 - 2y^2 + x^2 - y^2 + 2x^2 - 5xy - 3y^2$$

$$= 2xy - 6y^2 = 2y[x - 3y]$$

$$25. (b) 19 \div 5 \text{ of } (27 - \overline{15 - 21}) \div 33$$

$$= 19 \div 5 \text{ of } (27 + 6) \div 33$$

$$= 19 \div 5 \times 33 \div 33$$

$$= \frac{19}{5}$$

$$26. (d) \text{ Using the simplification rule BODMAS}$$

$$= 81^{\frac{3}{4}} + \left[\frac{(20 \div 5 \text{ of } 3 \times 6) + \left\{ (8 \div 24 \text{ of } 3) \times 4 \right\}}{-10 \div 5} \right] - \left(\frac{1}{32} \right)^{-\frac{2}{5}}$$

$$= (3)^{4 \times \frac{3}{4}} + \left[\frac{(20 \div 15 \times 6) + \left\{ (8 \div 72) \times 4 \right\}}{-10 \div 5} \right] - \left(\frac{1}{2} \right)^{5 \times -\frac{2}{5}}$$

$$= (3)^3 + \left[\frac{(20 \times 6) + \left\{ \left(\frac{8}{72} \right) \times 4 \right\}}{-2} \right] - 4$$

$$= 27 + \left[8 + \frac{4}{9} - 2 \right] - 4$$

$$= 27 + 8 - 2 - 4 + \frac{4}{9} = 29\frac{4}{9}$$

$$27. (c) \text{ Given,}$$

$$= \frac{\sqrt[3]{-2744} \times \sqrt[3]{-216}}{\sqrt[3]{64}}$$

$$\frac{\sqrt[3]{-14 \times -14 \times -14}}{\sqrt[3]{2^3}}$$

$$= \frac{\sqrt[3]{-6 \times -6 \times -6}}{\sqrt[3]{4 \times 4 \times 4}}$$

$$= \frac{-14 \times -6}{\frac{4}{9}} = \frac{-14 \times -6 \times 9}{4} = 189$$

$$28. (c) 72 \div 8 \times \{[(57 - 49) \div 2] + \{(85 - 60) \div 5\} - \{(28 - 19) \div 3\}\}$$

$$= 9 \times [8 \div 2] + \{25 \div 5\} - \{9 \div 3\}$$

$$= 9 \times [4 + 5 - 3]$$

$$= 9 \times [6] = 54$$

29. (b) $1801 \times 1801 = (1801)^2$
 $= (1800 + 1)^2$
 $= 1800^2 + 2 \times 1800 \times 1 + 1^2$
 $= 3240000 + 3600 + 1$
 $= 3243601$

30. (d) Rules of Surds and Indices

1. $a^m \times a^n = a^{(m+n)}$

2. $a^m \div a^n = a^{(m-n)}$

3. if $a^m = a^n$ then $m = n$

$\{(5 \times 5 \times 5 \times 5 \times 5 \times 5)^5 \times (5 \times 5 \times 5 \times 5 \times 5)^8\} \div (5 \times 5) = (625)^a$

$\Rightarrow \{(5)^{6 \times 5} \times (5)^{5 \times 8}\} \div (5)^2 = (5 \times 5 \times 5 \times 5)^a$

$\Rightarrow \{(5)^{30} \times (5)^{40}\} \div (5)^2 = (5)^{4a}$

$\Rightarrow (5)^{30+40} \div (5)^2 = (5)^{4a}$

$\Rightarrow (5)^{70-2} = (5)^{4a}$

$\Rightarrow (5)^{68} = (5)^{4a}$

$\Rightarrow 68 = 4a$

$\Rightarrow a = 17$

31. (c) Solve using the simplification rule BODMAS

$12^3 \times (16^2 - 14^2 - 40) \div 2 - 9^4$

$= 1728 \times (256 - 196 - 40) \div 2 - 81$

$= 1728 \times 20 \div 2 - 81$

$= 17280 - 81 = 17199$

32. (c) Solve using the simplification rule BODMAS

$72 - 42 \div 6 \text{ of } 7 \times 4 \text{ of } 3 \div 4 \times 3 - 5$

$= 72 - 42 \div 42 \times 12 \div 4 \times 3 - 5$

$= 72 - 1 \times 3 \times 3 - 5$

$= 72 - 9 - 5 = 72 - 14 = 58$

33. (d)

Given,

$\{(1 \div x) \times (x^3 - 2x^2) + (4^3 \div 2^5) \times x\} \div 25 = 1$

$\Rightarrow \frac{\left\{ \frac{1}{x} \times x(x^3 - 2x^2) + 2 \times x \right\}}{25} = 1$

$\Rightarrow x^2 - 2x + 2x = 25$

$\Rightarrow x^2 = 25$

$\Rightarrow x^2 = \pm 25$

$\Rightarrow x^2 = \pm 5$

34. (a) $(0.00243)^{0.2} = \left(\frac{243}{100000} \right)^{\frac{1}{5}}$

$= \left(\frac{3}{10} \right)^{5 \times \frac{1}{5}} = \frac{3}{10} = 0.3$

35. (a) $(0.2)^3 \times 400 \div 2000 \text{ of } (0.2)^2$

$= 0.008 \times 400 \div 2000 \text{ of } 0.04$

$= 0.008 \times 400 \div 80$

$= 0.008 \times 5$

$= 0.040 = \frac{1}{25}$

36. (a) $(7^3 - 7^2 + 6) \times (6^3 - 2^3 - 3^2 + 1) \div (21^2 + 20^2 - 41)$
 $= (343 - 49 + 6) \times (216 - 8 - 9 + 1) \div (441 + 400 - 41)$
 $= (349 - 49) \times (217 - 17) \div (841 - 41)$
 $= \frac{300 \times 200}{800} = 75$

37. (a)

$456 - (76 + 15^2) + \frac{3}{4} \text{ of } \frac{76}{18} \div \left(\frac{19}{72 \times 24} \right)$

$= 456 - (76 + 225) + \frac{19}{6} \div \left(\frac{19}{72 \times 24} \right)$

$= 456 - 301 + \frac{19}{6} \times \left(\frac{72 \times 24}{19} \right)$

$= 456 - 301 + 288$

$= 744 - 301 = 443$

38. (c) $\therefore \frac{5 - \frac{3}{7} \times 1 \frac{4}{5} \div 3 \frac{6}{7}}{\frac{3}{2} + 1 \frac{2}{5} \div 3 \frac{1}{2} \times 1 \frac{1}{4}}$

$= \frac{5 - \frac{3}{7} \times \frac{9}{5} \div \frac{27}{7}}{\frac{3}{2} + \frac{7}{5} \div \frac{7}{2} \times \frac{5}{4}} = \frac{5 - \frac{3}{7} \times \frac{9}{5} \times \frac{7}{27}}{\frac{3}{2} + \frac{7}{5} \times \frac{2}{7} \times \frac{5}{4}}$

$= \frac{5 - \frac{1}{2}}{\frac{3}{2} + \frac{1}{2}} = \frac{23}{10} \times \frac{1}{2} = 1 \frac{3}{20}$

39. (c)

$\{1 + 7 + (16 \div 8 \div 2)\} + \left\{ (6 \times 2^2 + 6) \times \frac{2}{\sqrt{36}} \right\}$

$= \{8 + 1\} + \left\{ (6 \times 4 + 6) \times \frac{2}{6} \right\}$

$= 9 + \left\{ 30 \times \frac{2}{6} \right\} = 9 + 10 = 19$

40. (c)

$\left[1 \frac{2}{7} \times \left\{ 3 \frac{1}{2} \div \left(\frac{1}{2} - \frac{1}{7} \right) \right\} \right] \div \left(4 \frac{1}{5} \times 1 \frac{1}{2} \right)$

$= \left[\frac{9}{7} \times \left\{ \frac{7}{2} \div \left(\frac{1}{2} - \frac{1}{7} \right) \right\} \right] \div \left(\frac{21}{5} \times \frac{3}{2} \right)$

$= \left[\frac{9}{7} \times \left\{ \frac{7}{2} \div \left(\frac{7-2}{14} \right) \right\} \right] \div \left(\frac{63}{10} \right)$

$= \left[\frac{9}{7} \times \left\{ \frac{7}{2} \div \frac{5}{14} \right\} \right] \div \left(\frac{63}{10} \right)$

$= \left[\frac{9}{7} \times \left\{ \frac{7}{2} \times \frac{14}{5} \right\} \right] \div \left(\frac{63}{10} \right)$

$= \left[\frac{126}{10} \right] \div \left(\frac{63}{10} \right) = 2$

41. (c)

$\left[\frac{5}{8} - \left\{ \frac{3}{8} - \left(\frac{5}{8} - \frac{3}{8} \right) \right\} \right] \text{ of } 8.8 - 1.2$

$4 \frac{1}{6} \div 2.5 \times 2 \div \frac{1}{6} \text{ of } 60 + \left(\frac{3}{4} - \frac{3}{8} \right)$

$= \left[\frac{5}{8} - \left\{ \frac{3}{8} - \frac{2}{8} \right\} \right] \text{ of } 8.8 - 1.2$

$= \frac{25}{6} \div 2.5 \times 2 \div 10 + \left(\frac{6-3}{8} \right)$

$= \left[\frac{5}{8} - \frac{1}{8} \right] \text{ of } 8.8 - 1.2$

$= \frac{25}{6} \times \frac{10}{25} \times 2 \times \frac{1}{10} + \left(\frac{3}{8} \right)$

$= \frac{1}{2} \text{ of } 8.8 - 1.2 = \frac{4.4 - 1.2}{2}$

$= \frac{1}{3} + \left(\frac{3}{8} \right) = \frac{1}{3} + \left(\frac{3}{8} \right)$

$= \frac{4.4 - 1.2}{8 + 9} = \frac{3.2 \times 24}{17} = 4 \frac{44}{85}$

42. (c)

$6 \frac{8}{15} \div \frac{7}{9} \text{ of } \left(1 \frac{1}{10} + 5 \frac{1}{5} \right) + \frac{2}{5} \div 7 \frac{1}{5}$

$= \frac{98}{15} \div \frac{7}{9} \text{ of } \left(\frac{11}{10} + \frac{26}{5} \right) + \frac{2}{5} \div \frac{36}{5}$

$= \frac{98}{15} \div \frac{7}{9} \text{ of } \left(\frac{11+52}{10} \right) + \frac{2}{5} \div \frac{36}{5}$

$= \frac{98}{15} \div \frac{7}{9} \text{ of } \frac{63}{10} + \frac{2}{5} \div \frac{36}{5}$

$= \frac{98}{15} \div \frac{49}{10} + \frac{2}{5} \div \frac{36}{5}$

$= \frac{98}{15} \times \frac{10}{49} + \frac{2}{5} \times \frac{5}{36}$

$= \frac{4}{3} + \frac{1}{18} = \frac{24+1}{18} = \frac{25}{18}$

43. (b) $\frac{(187 \div 17 \times a - 3 \times 3)}{(8^2 - 9 \times 7 + a^2)} = 1$

$\Rightarrow \frac{11a - 9}{1 + a^2} = 1$

$\Rightarrow 11a - 9 = 1 + a^2$

$\Rightarrow a^2 - 11a + 10 = 0$

$\Rightarrow a^2 - 10a - a + 10 = 0$

$\Rightarrow a(a - 10) - 1(a - 10) = 0$

$\Rightarrow (a - 1)(a - 10) = 0$

$\Rightarrow a = 1 \text{ or } 10$

Hence, Answer (b)



SMART APPROACH:-

Put the value from the option directly.

58. (d) $\left(5 \div 2 \text{ of } \frac{1}{2}\right) + \left(5\frac{1}{4} \div \frac{3}{7} \text{ of } \frac{1}{2}\right)$
 $\div \left(5\frac{1}{9} - 7\frac{7}{8} \div 9\frac{9}{20}\right) \times \frac{11}{21} = ?$

$$\Rightarrow 5 + \left(\frac{21}{4} \div \frac{3}{14}\right) \div \left(\frac{46}{9} - \frac{63}{8} \div \frac{189}{20}\right) \times \frac{11}{21}$$

$$\Rightarrow 5 + \left(\frac{49}{2}\right) \div \left(\frac{46}{9} - \frac{63}{8} \times \frac{20}{189}\right) \times \frac{11}{21}$$

$$\Rightarrow 5 + \frac{49}{2} \div \left(\frac{46}{9} - \frac{5}{6}\right) \times \frac{11}{21}$$

$$\Rightarrow 5 + \frac{49}{2} \div \left(\frac{184 - 30}{36}\right) \times \frac{11}{21}$$

$$\Rightarrow 5 + \frac{49 \times 36}{2 \times 154} \times \frac{11}{21}$$

$$\Rightarrow 5 + 3 = 8$$

59. (c) $\frac{4.35 \times 4.35 \times 4.35 + 3.25 \times 3.25 \times 3.25}{43.5 \times 43.5 + 32.5 \times 32.5 - 43.5 \times 32.5} = ?$

$$\Rightarrow \frac{1}{10000} \left[\frac{435^3 + 325^3}{435^2 + 325^2 - 435 \times 325} \right]$$

$$\Rightarrow \frac{1}{10000} \left[\frac{760}{1} \right] \Rightarrow 0.076$$

60. (d) $\frac{2}{3} \div \frac{3}{10} \text{ of } \frac{4}{9} - \frac{4}{5} \times \frac{1}{9} \div \frac{8}{15} - \frac{3}{4} \div \frac{3}{4} \div \frac{1}{2} = ?$

$$\Rightarrow \frac{2 \times 90}{3 \times 12} - \frac{4}{5} \times \frac{10}{9} \times \frac{15}{8} - \frac{3}{4} \div \frac{3}{4} + \frac{3}{2}$$

$$\Rightarrow 5 - \frac{5}{3} - \frac{3}{4} + \frac{3}{2}$$

$$\Rightarrow \frac{13}{2} - \frac{29}{12} = \frac{78 - 29}{12} = \frac{49}{12}$$

61. (d) $-7 \div [5 + 1 \div 2 - \{4 + (4 \text{ of } 2 \div 4) + (4 \div 4 \text{ of } 2)\}]$

$$\Rightarrow -7 \div [5 + 1 \div 2 - \{(4 + 2) + (\frac{1}{2})\}]$$

$$\Rightarrow -7 \div \left[5 + 1 \div 2 - \frac{13}{2}\right]$$

$$\Rightarrow -7 \div -1$$

$$\Rightarrow 7$$

62. (d) $\frac{40 + \frac{3}{4} \text{ of } 32}{37 + \frac{3}{4} \text{ of } (34 - 6)} = ?$

$$\Rightarrow \frac{40 + 24}{37 + 21} = \frac{64}{58}$$

$$\Rightarrow \frac{32}{29} = 1\frac{3}{29}$$

63. (c) $\therefore a = 535, b = 365$

$$\Rightarrow \frac{1}{10000} [535 + 365]$$

$$\Rightarrow \frac{900}{10000} = 0.09$$

64. (a)

$$1 - 3 \div 6 \text{ of } 2 + \left(4 \div 4 \text{ of } \frac{1}{4}\right) \div 8 +$$

$$\left(4 \times 8 \div \frac{1}{4}\right) \times \frac{1}{8} = ?$$

$$\Rightarrow 1 - \frac{3}{12} + (4) \div 8 + 128 \times \frac{1}{8}$$

$$\Rightarrow 1 - \frac{1}{4} + \frac{4}{8} + 16$$

$$\Rightarrow 17 + \frac{4}{8} - \frac{1}{4}$$

$$\Rightarrow \frac{69}{4}$$

65. (a) $\therefore a = 427, b = 325$

$$\Rightarrow 100 (427 + 325)$$

$$\Rightarrow 75200$$

66. (b) $7 \div [5 + 1 \div 2 - \{4 + (4 \text{ of } 2 \div 4) + (5 \div 5 \text{ of } 2)\}] = ?$

$$\Rightarrow 7 \div [5 + 1 \div 2 - \{4 + 2 + \frac{1}{2}\}]$$

$$\Rightarrow 7 \div \left[5 + \frac{1}{2} - \frac{13}{2}\right]$$

$$\Rightarrow 7 \div \left[\frac{11}{2} - \frac{13}{2}\right] \Rightarrow -7$$

67. (b) $(320 + 342 + 530 + 915) \div (20 + 22 - x + 18) = 43$

$$\Rightarrow \frac{2107}{60 - x} = 43$$

$$\Rightarrow 2107 = 2580 - 43x$$

$$\Rightarrow 473 = 43x$$

$$\Rightarrow x = 11$$

68. (b) $\frac{8}{13} \times \frac{15}{16} \times \frac{2}{3} - \frac{3 + 4}{27 + 64}$

$$= \frac{8}{13} \times \frac{5}{8} - \frac{7}{91} = \frac{5}{13} - \frac{7}{91} = \frac{4}{13}$$

69. (a)

$$= 7\frac{1}{3} \div 2\frac{1}{2} \text{ of } 1\frac{3}{5} - \left(\frac{3}{8} + \frac{1}{7} \times 1\frac{3}{4}\right) - \frac{5}{24}$$

$$= \frac{22}{3} \div \frac{5}{2} \times \frac{8}{5} - \left[\frac{3}{8} + \frac{1}{7} \times \frac{7}{4}\right] - \frac{5}{24}$$

$$= \frac{22}{3} \div \frac{40}{10} - \left[\frac{3}{8} + \frac{1}{4}\right] - \frac{5}{24}$$

$$= \frac{11}{6} - \frac{5}{8} - \frac{5}{24}$$

$$= \frac{44 - 15 - 5}{24} = \frac{24}{24} = 1$$

70. (a) $(0.08\% \text{ of } 0.008\% \text{ of } 8)^{\frac{1}{9}}$

$$= \frac{8}{10000} \times \frac{8}{100000} \times 8$$

$$= \left[\left(\frac{2}{10}\right)^9\right]^{\frac{1}{9}} = \frac{2}{10} = 0.2$$

71. (c) $\left\{\frac{1}{8}\left(x + \frac{1}{y}\right)^2 - \left(x - \frac{1}{y}\right)^2\right\}$

$$= \left\{\frac{1}{8}\left(x^2 + \frac{1}{y^2} + \frac{2x}{y} - x^2 - \frac{1}{y^2} + \frac{2x}{y}\right)\right\}$$

$$= \frac{1}{8} \times \frac{4x}{y} = \frac{x}{2y}$$

72. (d) Given that,

$$\frac{1}{\sqrt{7 - 4\sqrt{3}}}$$

$$\Rightarrow \frac{1}{\sqrt{7 - 2\sqrt{12}}}$$

$$\Rightarrow \frac{1}{2 - \sqrt{3}} \times \frac{2 + \sqrt{3}}{2 + \sqrt{3}}$$

$$\Rightarrow 2 + \sqrt{3} = 3.7$$

73. (a) Given that,

$$0.325 \times 0.325 + 0.175 \times 0.175 -$$

$$\frac{25 \times 0.00455}{5 \times 0.0065 \times 3.25 - 7 \times 0.175 \times 0.025}$$

$$5 \times 0.0065 \times 3.25 - 7 \times 0.175 \times 0.025$$

Let,

$$A = 0.325, B = 0.175$$

Then,

$$\frac{(A - B)^2}{A^2 - B^2} = \frac{A - B}{A + B}$$

$$\frac{0.325 - 0.175}{0.325 + 0.175} = \frac{0.15}{0.5} = 0.3$$

This value lies between 0.25 to 0.35

74. (c) $5 \div [5 + 8 - \{4 + (4 \text{ of } 2 \div 4) - (2 \div 4 \text{ of } 2)\}]$

$$= 5 \div \left[5 + 8 - \left\{4 + 2 - \frac{1}{4}\right\}\right]$$

$$= 5 \div \left[5 + 8 - \frac{23}{4}\right] = 5 \times \frac{4}{29} = \frac{20}{29}$$

75. (b)

$$\left(5\frac{1}{4} \div \frac{3}{7} \text{ of } \frac{1}{2}\right) \div \left(5\frac{1}{9} - 7\frac{7}{8} \div 9\frac{9}{20}\right)$$

$$\times \frac{11}{21} + \left(2 \div 2 \text{ of } \frac{1}{2}\right)$$

$$= \left(\frac{21}{4} \div \frac{3}{14}\right) \div \left(\frac{46}{9} - \frac{63}{8} \div \frac{189}{20}\right) \times \frac{11}{21} + 2$$

$$= \left(\frac{21}{4} \times \frac{14}{3}\right) \div \left(\frac{46}{9} - \frac{63}{8} \times \frac{20}{189}\right) \times \frac{11}{21} + 2$$

$$= \frac{49}{2} \times \frac{18}{77} \times \frac{11}{21} + 2 = 5$$

76. (a) $(a^3 + b^3 + c^3 = 3abc)$

$$\frac{0.74 \times 1.23 \times 0.13}{(0.37)^3 + (0.41)^3 - 8(0.39)^3}$$

$$= \frac{2 \times (0.37) \times 3(0.41) \times 0.13}{(0.37)^3 + (0.41)^3 - (2 \times 0.39)^3}$$

$$= \frac{2 \times (0.37) \times 3(0.41) \times 0.13}{(0.37)^3 + (0.41)^3 - (0.78)^3}$$

$$= \frac{(0.37) \times (0.41) \times (0.78)}{-3(0.37)(0.41)(0.78)} = \frac{-1}{3}$$

77. (c) $\frac{\sqrt{0.6912} + \sqrt{0.5292}}{\sqrt{0.6912} - \sqrt{0.5292}}$

(divided by $\sqrt{12}$ in both numerator and denominator)

$$= \frac{\frac{\sqrt{0.6912}}{\sqrt{12}} + \frac{\sqrt{0.5292}}{\sqrt{12}}}{\frac{\sqrt{0.6912}}{\sqrt{12}} - \frac{\sqrt{0.5292}}{\sqrt{12}}}$$

$$= \frac{\sqrt{576} + \sqrt{441}}{\sqrt{576} - \sqrt{441}} = \frac{24 + 21}{24 - 21} = \frac{45}{3} = 15$$

78. (a)

$$\left[\frac{4}{9} \div \left(\frac{3}{2} \div \frac{3}{2} \right) \times \frac{9}{25} \right] \times \left[\frac{2}{3} \text{ of } \frac{4}{9} \div \left(3 \times \frac{3}{5} \text{ of } \frac{4}{5} \right) \right]$$

$$= \left[\frac{4}{9} \div 1 \times \frac{9}{25} \right] \times \left[\frac{8}{27} \div \frac{36}{25} \right]$$

$$= \left[\frac{4}{9} \times \frac{9}{25} \right] \times \left[\frac{8}{27} \times \frac{25}{36} \right]$$

$$\frac{4}{25} \times \frac{50}{27 \times 9} = \frac{8}{243}$$

Required difference

$$\Rightarrow \frac{2}{9} - \frac{8}{243}$$

$$= \frac{54 - 8}{243} \Rightarrow \frac{46}{243}$$

79. (a) $\frac{5 - [2 + 3(2 - 2 \times 2 + 5) - 5] \div 5}{4 \times 4 \div 4 \text{ of } (4 + 4 \div 4 \text{ of } 4)}$

$$= \frac{19}{16} = \frac{19}{5} \times \frac{17}{16} = \frac{323}{80} = 4 \frac{3}{80}$$

80. (a)

$$\frac{4.669 \times 4.669 - 9 \times (0.777)^2}{(4.669)^2 + (2.331)^2 + 14(0.667)(2.331)} = 1 - K$$

$$\frac{(4.669)^2 - (2331)^2}{(4.669)^2 + (2.331)^2 + 2(4.669)(2.331)} = 1 - K$$

$$= \frac{(4.669)^2 - (2331)^2}{(4.669 + 2331)^2} = 1 - K$$

$$= \frac{(4669 + 2331)(4669 - 2331)}{(4669 + 2331)(4669 + 2331)} = \frac{2338}{7000}$$

$$= 0.334$$

$$= 0.334 = 1 - K$$

$$= K = 1 - 0.334 = 0.666$$

81. (b) $\frac{\frac{1}{3} + \left[4 \frac{3}{4} - \left(3 \frac{1}{6} - 2 \frac{1}{3} \right) \right]}{\left(\frac{1}{5} \text{ of } \frac{1}{5} \div \frac{1}{5} \right) \div \left(\frac{1}{5} \div \frac{1}{5} \times \frac{1}{5} \right)}$

$$= \frac{1}{3} + \frac{47}{12} = 4.25$$

It lies between = (4.2 and 4.4)

82. (b) $\sqrt{11 + 2\sqrt{18}}$

$$= \sqrt{9} + \sqrt{2}$$

$$= 3 + 1.4 = 4.4$$

83. (b) $9 \times [(9 - 4) \div \{(8 \div 8 \text{ of } 4) + (4 \div 4 \text{ of } 2)\}]$

$$= 9 \times \left[5 \div \left\{ \left(8 \times \frac{1}{32} \right) + \left(4 \times \frac{1}{8} \right) \right\} \right]$$

$$= 9 \times \left[5 \div \left\{ \frac{1}{4} + \frac{1}{2} \right\} \right]$$

$$= 9 \times \left[5 \times \frac{4}{3} \right] = 60$$

84. (c)

$$= \frac{(0.13)^2 + (0.21)^2}{(0.39)^2 + 81(0.07)^2} \div \frac{(2.4)^4 + 3 \times (11.52) + 9}{(2.4)^6 + 6(2.4)^4 + 3 \times (17.28)}$$

$$= \frac{(0.13)^2 + (0.21)^2}{9[(0.13)^2 + 9(0.07)^2]} \div \frac{(2.4)^4 + 3 \times (11.52) + 9}{2.4^2[(2.4)^4 + 6(2.4)^2 + 3 \times 3]}$$

$$= \frac{(0.13)^2 + (0.21)^2}{9[(0.13)^2 + (0.21)^2]} \div \frac{(2.4)^4 + 3 \times (11.52) + 9}{2.4^2[(2.4)^4 + 3 \times 11.52 + 9]}$$

$$= \frac{1}{9} \div \frac{1}{5.76} = \frac{5.76}{9} = 0.64$$

Value of the expression lies between 0.6 and 0.7.

85. (b) $8 \div [(9 - 5) \div \{(4 \div 2 \text{ of } 4) - (8 \div 8 \text{ of } 16) + (4 \times 2 \div 8)\}]$

$$= 8 \div \left[4 \div \left\{ \frac{1}{2} - \frac{1}{16} + \frac{1}{1} \right\} \right]$$

$$= 8 \div \left[4 \div \left\{ \frac{8 - 1 + 16}{16} \right\} \right]$$

$$= 8 \div \left[4 \times \frac{16}{23} \right] = 8 \times \frac{23}{64} = \frac{23}{8}$$

86. (a) $= \frac{\left(3 \frac{1}{3} - 2 \frac{1}{2} \right) \div \frac{1}{4} \text{ of } 1 \frac{1}{4}}{\frac{3}{10} + \frac{1}{6} \times \frac{1}{3}} \text{ of } \frac{4}{15}$

$$\div \frac{\frac{1}{3} \div \frac{1}{3} \text{ of } \frac{1}{9}}{\frac{1}{9} \times \frac{1}{3} \div \frac{1}{6}} = \frac{\left(\frac{10}{3} - \frac{5}{2} \right) \div \frac{1}{4} \text{ of } \frac{5}{4}}{\frac{3}{10} + \frac{1}{18}} \text{ of}$$

$$\frac{4}{15} \div \frac{\frac{1}{3} \div \frac{1}{27}}{\frac{1}{9} \times \frac{1}{3} \times \frac{1}{1}} = \frac{\frac{5}{6} \div \frac{5}{16}}{\frac{64}{180}} \text{ of}$$

$$\frac{4}{15} \div \frac{1}{9} = \frac{8}{3} \times \frac{180}{64} \text{ of } \frac{4}{15} \div \frac{9}{1} \times \frac{9}{2}$$

$$= \frac{8}{3} \times \frac{180}{64} \times \frac{4}{15} \times \frac{2}{81} = \frac{4}{81}$$

87. (b) $\sqrt{6 - \sqrt{17 - 2\sqrt{72}}}$

$$= \sqrt{6 - \sqrt{17 - 2 \times 6\sqrt{2}}}$$

$$= \sqrt{6 - \sqrt{17 - 12 \times 1.4}}$$

$$= \sqrt{6 - \sqrt{17 - 16.8}} = \sqrt{6 - \sqrt{0.2}}$$

$$= \sqrt{6 - 0.14} = \sqrt{5.76} = 2.4$$

88. (c) $\sqrt{0.00576 \times y} = 2.4$

Squaring both sides

$$\Rightarrow (\sqrt{0.00576 \times y})^2 = (2.4)^2$$

$$\Rightarrow 0.00576 \times y = 5.76$$

$$\Rightarrow y = 1000$$

89. (b) $\frac{(2.8)^3 + (2.2)^3}{(28)^2 - 28 \times 22 + 484}$

We know,

$$a^3 + b^3 = (a + b)(a^2 + b^2 - ab)$$

$$= \frac{(28)^3 + (22)^3 \times 10^{-3}}{(28)^2 - 28 \times 22 + 22^2}$$

$$= \frac{(28 + 22)[(28)^2 - 28 \times 22 + (22)^2] \times 10^{-3}}{(28)^2 - 28 \times 22 + (22)^2}$$

$$= 50 \times 10^{-3} = 0.05$$

90. (c) Solving using BODMAS rule-

$$\frac{17.35 + \frac{7}{5} \text{ of } 55 - 7}{(42 \div 6 \times 8.35) - \frac{3}{7} \text{ of } \left(\frac{2}{3} - \frac{1}{5} \right) + [291 \div (80 \div 8)]}$$

$$= \frac{17.35 + \frac{7}{5} \times 55 - 7}{(7 \times 8.35) - \frac{3}{7} \text{ of } \left(\frac{7}{15} \right) + 29.1}$$

$$= \frac{17.35 + 77 - 7}{58.45 - \frac{1}{5} + 29.1}$$

$$= \frac{87.35}{(58.45 - 0.2 + 29.1)}$$

$$= \frac{87.35}{87.35} = 1$$

91. (d) Solving using BODMAS rule-

$$\frac{56 + \frac{2}{3} \text{ of } 27 - 8}{15 - \frac{3}{5} \text{ of } (29 - 14)}$$

$$= \frac{56 + \frac{2}{3} \times 27 - 8}{15 - \frac{3}{5} \times 15} = \frac{56 + 18 - 8}{15 - 9}$$

$$= \frac{66}{6} = 11$$

92. (b) We know, If $a + b + c = 0$, then $a^3 + b^3 + c^3 = 3abc$

$$\text{Here, } 0.321 + 0.456 - 0.777 = 0$$

$$\therefore \frac{(0.321)^3 + (0.456)^3 - (0.777)^3}{0.9 \times (0.107)(0.76)(0.777)}$$

$$= \frac{-3 \times 0.321 \times 0.456 \times 0.777}{0.9 \times (0.107)(0.76)(0.777)} = -6$$

93. (a)

$$\frac{5 - 2 \div 4 \times [5 - (3 - 4)] + 5 \times 4 \div 2 \text{ of } 4}{4 + 4 \div 8 \text{ of } 2 \times (8 - 5) \times 2 \div 3 - 8 \div 2 \text{ of } 8}$$

$$= \frac{5 - \frac{1}{2} \times 6 + \frac{5}{2}}{4 + 4 \times \frac{1}{16} \times 3 \times 2 \times \frac{1}{3} - 8 \times \frac{1}{16}}$$

$$= \frac{\frac{5}{1} - \frac{3}{1} + \frac{5}{2}}{4 + \frac{1}{4} \times 2 - \frac{1}{2}} = \frac{\frac{9}{2}}{\frac{4}{1}} = \frac{9}{8}$$

94. (d)

$$= \frac{\left(2\frac{1}{3} + 2\frac{1}{2} - \frac{1}{6}\right) \div 2\frac{1}{3} \times 5\frac{2}{3} \div 1\frac{2}{3} \text{ of } 4\frac{1}{4}}{3\frac{1}{5} \div 4\frac{1}{2} \text{ of } 5\frac{1}{3} + 5\frac{1}{3} \times \frac{3}{4} \div 2\frac{2}{3}}$$

$$= \frac{\left(\frac{7}{3} + \frac{5}{2} - \frac{1}{6}\right) \div \frac{7}{3} \times \frac{17}{3} \div \frac{5}{3} \text{ of } \frac{17}{4}}{\frac{16}{5} \div \frac{9}{2} \text{ of } \frac{16}{3} + \frac{16}{3} \times \frac{3}{4} \div \frac{8}{3}}$$

$$= \frac{\frac{14}{3} \div \frac{7}{3} \times \frac{17}{3} \div \frac{85}{12}}{\frac{16}{5} \div 24 + \frac{16}{3} \times \frac{3}{4} \times \frac{8}{3}}$$

$$= \frac{2 \times \frac{17}{3} \times \frac{12}{85}}{\frac{16}{5} \times \frac{1}{24} + \frac{3}{2}} = \frac{\frac{8}{5}}{\frac{2}{15} + \frac{3}{2}}$$

$$= \left[\frac{8}{5}\right] \times \left[\frac{30}{49}\right] = \frac{48}{49}$$

$$\text{Required difference} = \frac{48}{49} - \frac{6}{7} = \frac{6}{49}$$

95. (c)

$$\frac{4 - 3 \div 2 \times (4 - 2) - 3 + 4 \times 3 \div 2 + 4}{4 + 3 \div 4 \times (2 - 4) \times 4 + 3 \div 4 \text{ of } 3}$$

$$= \frac{4 - \frac{3}{2} \times 2 - 3 + 4 \times \frac{3}{2} + 4}{4 + \frac{3}{4} \times (-2) \times 4 + 3 \times \frac{1}{12}}$$

$$= \frac{4 - 3 - 3 + 6 + 4}{4 - 6 + \frac{1}{4}} = \frac{8}{-7} \times 4 = \frac{-32}{7}$$

96. (b) $\frac{(0.013)^3 + (0.007)(0.000049)}{(0.007)^2 + 0.013(0.013 - 0.007)}$

$$= \frac{(13)^3 + (7)^3}{(7^2 + 13^2 - 7 \times 13) \times 1000}$$

$$(a^3 + b^3) = (a + b)(a^2 + b^2 - ab)$$

$$= \frac{(7 + 13)(7^2 + 13^2 - 7 \times 13)}{(7^2 + 13^2 - 7 \times 13) \times 1000}$$

$$= \frac{20}{1000} = 0.02$$

97. (a)

$$\frac{\left(1\frac{1}{9} \times 1\frac{1}{20} \div \frac{21}{38} - \frac{1}{3}\right) \div 2\frac{4}{9} \div 1\frac{7}{15} \text{ of } \frac{3}{5}}{\frac{1}{5} \text{ of } \frac{1}{5} \div \frac{1}{125} - \frac{1}{25} \div \frac{1}{5} \text{ of } \frac{1}{5}}$$

$$= \frac{\left(\frac{10}{9} \times \frac{21}{20} \times \frac{38}{21} - \frac{1}{3}\right) \div \left(\frac{22}{9} \div \frac{22}{15} \times \frac{3}{5}\right)}{\frac{1}{25} \times \frac{125}{1} - \frac{1}{25} \times \frac{25}{1}}$$

$$= \frac{\left(\frac{19}{9} - \frac{1}{3}\right) \div \left(\frac{22}{9} \times \frac{25}{22}\right)}{5 - 1}$$

$$= \frac{\frac{57 - 9}{27} \times \frac{9}{25}}{4} = \frac{\frac{48}{27} \times \frac{9}{25}}{4}$$

$$= \frac{16}{25 \times 4} = \frac{4}{25} = 0.16$$

0.16 lies between (0.15 and 0.2)

98. (d) $\sqrt{201} - \sqrt{199} = 0.10$

$$\sqrt{101} - \sqrt{99} = 0.07$$

$$\sqrt{301} - \sqrt{299} = 0.057$$

$$\sqrt{401} - \sqrt{399} = 0.050$$

The smallest value is

$$\sqrt{401} - \sqrt{399} = 0.050$$

99. (c) $\sqrt{9 - 2\sqrt{11 - 6\sqrt{2}}}$

$$= \sqrt{9 - 2\sqrt{3^2 + (\sqrt{2})^2 - 2 \times 3 \times \sqrt{2}}}$$

$$= \sqrt{9 - 2(3 - \sqrt{2})}$$

$$= \sqrt{9 - 6 + 2\sqrt{2}}$$

$$= \sqrt{3 + 2\sqrt{2}}$$

$$= \sqrt{(\sqrt{2})^2 + 1^2 + 2\sqrt{2}}$$

$$= \sqrt{2} + 1$$

$$= 1.4 + 1 = 2.4$$

100. (d) $\frac{1}{\sqrt{17 + 12\sqrt{2}}} = \frac{1}{\sqrt{17 + 2\sqrt{72}}}$

$$= \frac{1}{\sqrt{9 + \sqrt{8}}}$$

$$= \frac{1}{\sqrt{9 + \sqrt{8}}} \times \frac{\sqrt{9 - \sqrt{8}}}{\sqrt{9 - \sqrt{8}}} = \frac{3 - 2\sqrt{2}}{1}$$

$$= 3 - 2 \times 1.414 = 0.17$$





ALGEBRA

17

प्रतिश्चल

1. If $a + b = 10$ and $ab = 6$, then the value of $a^3 + b^3$ is:

किं $a + b = 10$ की $ab = 6$ की $a^3 + b^3$ का मान क्या है?

SSC CPO 03/10/2023 (Shift-01)

- (a) 860 (b) 820
(c) 800 (d) 840

2. If $\frac{x}{y} + \frac{y}{x} = 1$ and $x + y = 2$, then the value of $x^3 + y^3$ is:

किं $\frac{x}{y} + \frac{y}{x} = 1$ की $x + y = 2$ की $x^3 + y^3$ का मान क्या है?

SSC CPO 03/10/2023 (Shift-01)

- (a) 0 (b) 1
(c) 3 (d) 2

3. if $\frac{A}{L} + \frac{M}{B} = 1$ and $\frac{B}{M} + \frac{N}{C} = 1$, then the value of $\frac{L}{A} + \frac{C}{N}$ is :

किं $\frac{A}{L} + \frac{M}{B} = 1$ की $\frac{B}{M} + \frac{N}{C} = 1$ की $\frac{L}{A} + \frac{C}{N}$ का मान क्या है?

SSC CPO 03/10/2023 (Shift-02)

- (a) 1 (b) $\frac{B}{M}$
(c) $\frac{M}{B}$ (d) 0

4. If $x\left(5 - \frac{2}{x}\right) = \frac{5}{x}$, then the value of $x^2 + \frac{1}{x^2}$ is:

किं $x\left(5 - \frac{2}{x}\right) = \frac{5}{x}$ की $x^2 + \frac{1}{x^2}$ का मान क्या है?

SSC CPO 03/10/2023 (Shift-03)

- (a) $\frac{54}{23}$ (b) $\frac{53}{28}$

- (c) $\frac{53}{27}$ (d) $\frac{54}{25}$

5. If $a + \frac{1}{a} = 3$, then the value of

$a^4 + \frac{1}{a^4}$ is:

किं $a + \frac{1}{a} = 3$ की $a^4 + \frac{1}{a^4}$ का मान क्या है?

SSC CPO 04/10/2023 (Shift-01)

- (a) 27 (b) 81
(c) 48 (d) 47

6. If $a + b + c = 5$ and $ab + bc + ca = 7$, then the value of $a^3 + b^3 + c^3 - 3abc$ is:

किं $a + b + c = 5$ की $ab + bc + ca = 7$ की $a^3 + b^3 + c^3 - 3abc$ का मान क्या है?

SSC CPO 05/10/2023 (Shift-01)

- (a) 20 (b) 25
(c) 15 (d) 30

7. If $a - \frac{1}{a} = 4$, then the value of

$a + \frac{1}{a}$ is:

किं $a - \frac{1}{a} = 4$ की $a + \frac{1}{a}$ का मान क्या है?

SSC CPO 05/10/2023 (Shift-02)

- (a) $5\sqrt{5}$ (b) $4\sqrt{5}$
(c) $2\sqrt{5}$ (d) $3\sqrt{5}$

8. If $a - \frac{1}{a-5} = 10$, then the value

of $(a-5)^3 - \frac{1}{(a-5)^3}$ is:

किं $a - \frac{1}{a-5} = 10$ की $(a-5)^3 - \frac{1}{(a-5)^3}$ का मान क्या है?

SSC CPO 09/11/2022 (Shift-01)

- (a) 140
(b) 70
(c) 100
(d) 120

9. If $x^4 + \frac{1}{x^4} = 1154$, where $x > 0$, then what is the value of $x^3 + \frac{1}{x^3}$?

किं $x^4 + \frac{1}{x^4} = 1154$ की $x > 0$ की $x^3 + \frac{1}{x^3}$ का मान क्या है?

की $x^3 + \frac{1}{x^3}$ का मान क्या है?

SSC CPO 09/11/2022 (Shift-01)

- (a) 205 (b) 214
(c) 185 (d) 198

10. If $x^4 + x^{-4} = 7$, $x > 0$, then what is the value of $x^2 + \frac{1}{x^2} - 2$?

किं $x^4 + x^{-4} = 7$, $x > 0$ की $x^2 + \frac{1}{x^2} - 2$ का मान क्या है?

SSC CPO 09/11/2022 (Shift-01)

- (a) 1 (b) 0
(c) 5 (d) 3

11. If $a + b + c = 10$ and $a^2 + b^2 + c^2 = 48$, then the value of $ab + bc + ca$ is _____.

किं $a + b + c = 10$ की $a^2 + b^2 + c^2 = 48$ की $ab + bc + ca$ का मान क्या है?

SSC CPO 09/11/2022 (Shift-02)

- (a) 25 (b) 26
(c) 24 (d) 18

12. The value of

$\frac{(x-y)^3 + (y-z)^3 + (z-x)^3}{(x^2-y^2) + (y^2-z^2) + (z^2-x^2)}$ where $x \neq y \neq z$, is:

- $$\frac{(x-y)^3 + (y-z)^3 + (z-x)^3}{(x^2-y^2)^3 + (y^2-z^2)^3 + (z^2-x^2)^3}$$
 नये खेदरी ने कबरी वै के $x \neq y \neq z$ f
- SSC CPO 09/11/2022 (Shift-02)
- (a) 0
 (b) $\frac{1}{(x+y+z)}$
 (c) $\frac{1}{(x+y)(y+z)(z+x)}$
 (d) 1
13. If $a + b + c = 10$; $a^2 + b^2 + c^2 = 38$, what is the value of $(a-b)^2 + (b-c)^2 + (c-a)^2$?
 कि $a + b + c = 10$; $a^2 + b^2 + c^2 = 38$ र $(a-b)^2 + (b-c)^2 + (c-a)^2$ नये खेदरी ने कबरी वै
- SSC CPO 09/11/2022 (Shift-02)
- (a) 15 (b) 12
 (c) 14 (d) 13
14. The value of

$$\frac{\{(m^2+n^2)(m-n)-(m-n)^3\}}{(m^2n-mn^2)}$$
 is:

$$\frac{\{(m^2+n^2)(m-n)-(m-n)^3\}}{(m^2n-mn^2)}$$
 नये खेदरी ने कबरी वै
- SSC CPO 09/11/2022 (Shift-03)
- (a) $m+n$ (b) $m-n$
 (c) 2 (d) m/n
15. If $16y^2 - k = \left(4y + \frac{3}{2}\right)\left(4y - \frac{3}{2}\right)$, then the value of k is:
 कि $16y^2 - k = \left(4y + \frac{3}{2}\right)\left(4y - \frac{3}{2}\right)$ र k नये खेदरी ने कबरी वै
- SSC CPO 09/11/2022 (Shift-03)
- (a) $\frac{9}{4}$ (b) $\frac{11}{4}$
 (c) $\frac{6}{4}$ (d) $\frac{7}{4}$
16. If $x + y + z = 8$ and $x^2 + y^2 + z^2 = 20$ then the value of $x^3 + y^3 + z^3 - 3xyz$ is.
 कि $x + y + z = 8$ र $x^2 + y^2 + z^2 = 20$ र $x^3 + y^3 + z^3 - 3xyz$ नये खेदरी ने कबरी वै
- SSC CPO 09/11/2022 (Shift-03)

- (a) 16 (b) 10
 (c) 15 (d) -16
17. The simplified for of $(7x + 4y)^2 + (7x - 4y)^2$ is:
 $(7x + 4y)^2 + (7x - 4y)^2$ नये खेदरी ने कबरी वै
- SSC CPO 10/11/2022 (Shift-01)
- (a) $98x^2 + 32y^2$
 (b) $98x^2 + 32y^2 - 5xy$
 (c) $32x^2 + 98y^2$
 (d) $98x^2 - 32y^2$
18. What are the values of x and y , respectively form the following equations?
 $6x + 7y = 5xy$
 $10y - 4x = 4xy$
- SSC CPO 10/11/2022 (Shift-01)
- (a) 3 and 4 (b) 4 and 5
 (c) 2 and 4 (d) 2 and 5
19. If $x + y = 10$, $2xy = 48$ and $x > y$, then find $2x - y$.
 कि $x + y = 10$, $2xy = 48$ र $x > y$ र $2x - y$ नये खेदरी ने कबरी वै
- SSC CPO 10/11/2022 (Shift-01)
- (a) 6 (b) 8
 (c) 4 (d) 3
20. If $a^2 + b^2 + 1 = 2a$, then the value of $a^4 + b^7$ is:
 कि $a^2 + b^2 + 1 = 2a$ र $a^4 + b^7$ नये खेदरी ने कबरी वै
- SSC CPO 10/11/2022 (Shift-02)
- (a) 1 (b) 0
 (c) 2 (d) 4
21. If $x + \frac{1}{x} = 2$, then the value of

$$x^4 + \frac{1}{x^4}$$
- कि $x + \frac{1}{x} = 2$ र $x^4 + \frac{1}{x^4}$ नये खेदरी ने कबरी वै
- SSC CPO 10/11/2022 (Shift-02)
- (a) 0 (b) 2
 (c) -1 (d) 1
22. If a, b, c are all non-zero and $a + b + c = 0$, find the value of

$$\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab}$$

- कि a, b, c ह 0 र $a + b + c = 0$ र $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab}$ नये खेदरी ने कबरी वै
- SSC CPO 10/11/2022 (Shift-02)
- (a) 3 (b) 4
 (c) 1 (d) $\frac{1}{2}$
23. If $\frac{x^8+1}{x^4} = 14$, then the value of

$$\frac{x^{12}+1}{x^6}$$
 is
- कि $\frac{x^8+1}{x^4} = 14$ र $\frac{x^{12}+1}{x^6}$ नये खेदरी ने कबरी वै
- SSC CPO 10/11/2022 (Shift-03)
- (a) 16 (b) 14
 (c) 52 (d) 64
24. Simplify: $(x + y)^3 - (x - y)^3 - 6y(x^2 - y^2)$
 $(x + y)^3 - (x - y)^3 - 6y(x^2 - y^2)$ नये खेदरी ने कबरी वै
- SSC CPO 10/11/2022 (Shift-03)
- (a) $8y^3$ (b) x^3
 (c) $8x^3$ (d) y^3
25. If $x^2 + 6x + 1 = 0$, then the value of $(x + 6)^3 + \frac{1}{(x+6)^3} = ?$
 कि $x^2 + 6x + 1 = 0$ र $(x + 6)^3 + \frac{1}{(x+6)^3}$ नये खेदरी ने कबरी वै
- SSC CPO 10/11/2022 (Shift-03)
- (a) 245 (b) 216
 (c) 186 (d) 198
26. If $a + b = 10$ and $ab = 9$, then the value of $a - b$ is:
 कि $a + b = 10$ र $ab = 9$ र $a - b$ नये खेदरी ने कबरी वै
- SSC CPO 11/11/2022 (Shift-01)
- (a) 7 (b) 5
 (c) 8 (d) 6
27. If a, b and c are positive integers such that $a^2 + b^2 = 82$ and $b^2 + c^2 = 65$, then the value of $2a + 7b - 3c$ is
 कि a, b र c ह धन पूर्ण संख्या र $a^2 + b^2 = 82$ र $b^2 + c^2 = 65$ र $2a + 7b - 3c$ नये खेदरी ने कबरी वै
- SSC CPO 11/11/2022 (Shift-01)

- (a) 2 (b) 5
(c) 49 (d) 1
28. If $x(x - 5) = -1$, then the value of $x^3(x^3 - 110)$?

फिक्की $x(x - 5) = -1$ णी रक्खे $x^3(x^3 - 110)$ न षे' खे दखी न हर्नि

SSC CPO 11/11/2022 (Shift-01)

- (a) 0 (b) -1
(c) 1 (d) 2
29. If $r = 55$, then the value of $r(r^2 + 3r + 3)$ is

फिक्की $r = 55$ णी रक्खे $r(r^2 + 3r + 3)$ न षे' खे दखी न हर्नि

SSC CPO 11/11/2022 (Shift-01)

- (a) 105000 (b) 176615
(c) 175616 (d) 175615

30. If $a + \frac{1}{a} = p^2$, then find $a^2 + \frac{1}{a^2}$

फिक्की $a + \frac{1}{a} = p^2$ णी रक्खे $a^2 + \frac{1}{a^2}$ न षे' खे दखी न हर्नि

SSC CPO 11/11/2022 (Shift-02)

- (a) $p^2 - 2$ (b) $P^2 + 2$
(c) $P^4 - 2$ (d) $P^4 + 2$
31. If $a = 9.6$, $b = 4.44$ and $c = 5.16$, then the value of $a^3 - b^3 - c^3 - 3abc$ is:

फिक्की $a = 9.6$, $b = 4.44$ and $c = 5.16$ णी रक्खे $a^3 - b^3 - c^3 - 3abc$ न षे' खे दखी न हर्नि

SSC CPO 11/11/2022 (Shift-02)

- (a) 0 (b) -1
(c) 2 (d) 1
32. If $s - \frac{1}{s-8} = 20$, then the value of $(s-8)^3 - \frac{1}{(s-8)^3}$ is:

फिक्की $s - \frac{1}{s-8} = 20$ णी रक्खे $(s-8)^3 - \frac{1}{(s-8)^3}$ न षे' खे दखी न हर्नि

फिक्की $s - \frac{1}{s-8} = 20$ णी रक्खे $(s-8)^3 - \frac{1}{(s-8)^3}$ न षे' खे दखी न हर्नि

फिक्की $s - \frac{1}{s-8} = 20$ णी रक्खे $(s-8)^3 - \frac{1}{(s-8)^3}$ न षे' खे दखी न हर्नि

फिक्की $s - \frac{1}{s-8} = 20$ णी रक्खे $(s-8)^3 - \frac{1}{(s-8)^3}$ न षे' खे दखी न हर्नि

SSC CPO 11/11/2022 (Shift-03)

- (a) 1324 (b) 1764
(c) 1864 (d) 1944

33. If $x^2 + \frac{1}{x^2} = 98$, then the value of $x + \frac{1}{x}$ is:

फिक्की $x^2 + \frac{1}{x^2} = 98$ णी रक्खे $x + \frac{1}{x}$ न षे' खे दखी न हर्नि

SSC CPO 11/11/2022 (Shift-03)

- (a) 10 (b) 8
(c) 7 (d) 9
34. If the equation $k(21x^2 + 24) + rx + (14x^2 - 9) = 0$;

$k(7x^2 + 8) + px + (2x^2 - 3) = 0$; have both roots common, then the

value of $\frac{p}{r}$ is

फिक्की $k(21x^2 + 24) + rx + (14x^2 - 9) = 0$; $k(7x^2 + 8) + px + (2x^2 - 3) = 0$;

0; णी रक्खे $\frac{p}{r}$ न षे' खे दखी न हर्नि

फिक्की $k(21x^2 + 24) + rx + (14x^2 - 9) = 0$; $k(7x^2 + 8) + px + (2x^2 - 3) = 0$;

SSC CPO 11/11/2022 (Shift-03)

- (a) $\frac{1}{3}$ (b) $\frac{2}{5}$
(c) $\frac{4}{3}$ (d) $\frac{7}{5}$

35. If $a^2 + b^2 + c^2 + 216 = 12(a + b - 2c)$, then $\sqrt{ab - bc + ca}$ is:

फिक्की $a^2 + b^2 + c^2 + 216 = 12(a + b - 2c)$ णी रक्खे $\sqrt{ab - bc + ca}$ न षे' खे दखी न हर्नि

SSC CPO 23/11/2020 (Shift-1)

- (a) 6 (b) 4
(c) 3 (d) 8

36. If $(5\sqrt{5}x^3 - 3\sqrt{3}y^3) \div (\sqrt{5}x - \sqrt{3}y)$

$= (Ax^2 + By^2 + Cxy)$, then the

value of $(3A + B - \sqrt{15}C)$ is:

फिक्की $(5\sqrt{5}x^3 - 3\sqrt{3}y^3) \div (\sqrt{5}x - \sqrt{3}y) = (Ax^2 + By^2 + Cxy)$ णी रक्खे

$(3A + B - \sqrt{15}C)$ न षे' खे दखी न हर्नि

फिक्की $(5\sqrt{5}x^3 - 3\sqrt{3}y^3) \div (\sqrt{5}x - \sqrt{3}y) = (Ax^2 + By^2 + Cxy)$ णी रक्खे

SSC CPO 23/11/2020 (Shift-1)

- (a) 3 (b) 12
(c) 8 (d) 5

37. If $x^4 + x^{-4} = 194$, $x > 0$, then the

value of $x + \frac{1}{x}$ is:

फिक्की $x^4 + x^{-4} = 194$, $x > 0$ णी रक्खे $x + \frac{1}{x}$ न षे' खे दखी न हर्नि

फिक्की $x^4 + x^{-4} = 194$, $x > 0$ णी रक्खे $x + \frac{1}{x}$ न षे' खे दखी न हर्नि

SSC CPO 23/11/2020 (Shift-1)

- (a) 4 (b) 14
(c) 6 (d) 8

38. If $x^2 + 8y^2 - 12y - 4xy + 9 = 0$ then the value of $(7x - 8y)$ is:

फिक्की $x^2 + 8y^2 - 12y - 4xy + 9 = 0$ णी रक्खे $(7x - 8y)$ न षे' खे दखी न हर्नि

SSC CPO 23/11/2020 (Shift-2)

- (a) 9 (b) 5
(c) 12 (d) 21

39. If $x^2 - 5x + 1 = 0$, then the value

of $\left(x^4 + \frac{1}{x^2}\right) \div (x^2 + 1)$ is:

फिक्की $x^2 - 5x + 1 = 0$ णी रक्खे $\left(x^4 + \frac{1}{x^2}\right) \div (x^2 + 1)$ न षे' खे दखी न हर्नि

फिक्की $x^2 - 5x + 1 = 0$ णी रक्खे $\left(x^4 + \frac{1}{x^2}\right) \div (x^2 + 1)$ न षे' खे दखी न हर्नि

SSC CPO 23/11/2020 (Shift-2)

- (a) 21 (b) 25
(c) 24 (d) 22

40. If $x + y + z = 19$, $xyz = 216$ and $xy + yz + zx = 114$, then the value of $x^3 + y^3 + z^3 + xyz$ is:

फिक्की $x + y + z = 19$, $xyz = 216$ णी रक्खे $xy + yz + zx = 114$ णी रक्खे $x^3 + y^3 + z^3 + xyz$ न षे' खे दखी न हर्नि

SSC CPO 23/11/2020 (Shift-2)

- (a) 1441 (b) 361
(c) 1225 (d) 577

41. If $x^2 - 3x + 1 = 0$, then the value

of $\left(x^4 + \frac{1}{x^2}\right) \div (x^2 + 1)$ is:

फिक्की $x^2 - 3x + 1 = 0$ णी रक्खे $\left(x^4 + \frac{1}{x^2}\right) \div (x^2 + 1)$ न षे' खे दखी न हर्नि

फिक्की $x^2 - 3x + 1 = 0$ णी रक्खे $\left(x^4 + \frac{1}{x^2}\right) \div (x^2 + 1)$ न षे' खे दखी न हर्नि

SSC CPO 24/11/2020 (Shift-1)

- (a) 5 (b) 6
(c) 7 (d) 9

42. If $x + y + z = 17$, $xyz = 171$ and $xy + yz + zx = 111$, then the value of

$\sqrt[3]{(x^3 + y^3 + z^3 + xyz)}$ is:

फिक्की $x + y + z = 17$, $xyz = 171$ णी रक्खे $xy + yz + zx = 111$ णी रक्खे

$\sqrt[3]{(x^3 + y^3 + z^3 + xyz)}$ न षे' खे दखी न हर्नि

फिक्की $x + y + z = 17$, $xyz = 171$ णी रक्खे

SSC CPO 24/11/2020 (Shift-1)

- (a) -64 (b) 0
(c) 4 (d) -4

43. If $x^2 + 8y^2 + 12y - 4xy + 9 = 0$, then the value of $(7x + 8y)$ is:
 किसी $x^2 + 8y^2 + 12y - 4xy + 9 = 0$ है। $(7x + 8y)$ का मान ज्ञात करें।

SSC CPO 24/11/2020 (Shift-1)

- (a) -33 (b) 9
(c) 33 (d) -9

44. If $x + y + z = 13$, $x^2 + y^2 + z^2 = 133$ and $x^3 + y^3 + z^3 = 847$, then the value of $\sqrt[3]{xyz}$ is:

किसी $x + y + z = 13$, $x^2 + y^2 + z^2 = 133$ और $x^3 + y^3 + z^3 = 847$ है। $\sqrt[3]{xyz}$ का मान ज्ञात करें।

SSC CPO 24/11/2020 (Shift-2)

- (a) 8 (b) 7
(c) -9 (d) -6

45. If $a^3 + b^3 = 217$ and $a + b = 7$, then the value of ab is:
 किसी $a^3 + b^3 = 217$ और $a + b = 7$ है। ab का मान ज्ञात करें।

SSC CPO 24/11/2020 (Shift-2)

- (a) -6 (b) -1
(c) 7 (d) 6

46. If $a^2 + b^2 + c^2 + 84 = 4(a - 2b + 4c)$, then $\sqrt{ab - bc + ca}$ is equal to:
 किसी $a^2 + b^2 + c^2 + 84 = 4(a - 2b + 4c)$ है। $\sqrt{ab - bc + ca}$ का मान ज्ञात करें।

SSC CPO 24/11/2020 (Shift-2)

- (a) $4\sqrt{10}$ (b) $\sqrt{10}$
(c) $5\sqrt{10}$ (d) $2\sqrt{10}$

47. If $x + y + z = 19$, $x^2 + y^2 + z^2 = 133$ and $xz = y^2$, $x > z > 0$, what is the value of $(x - z)$?

किसी $x + y + z = 19$, $x^2 + y^2 + z^2 = 133$ और $xz = y^2$, $x > z > 0$ है। $(x - z)$ का मान ज्ञात करें।

SSC CPO 25/11/2020 (Shift-1)

- (a) 0 (b) 5
(c) -2 (d) -5

48. If $(5\sqrt{5}x^3 - 3\sqrt{3}y^3) \div (\sqrt{5}x - \sqrt{3}y) = (Ax^2 + By^2 + Cxy)$, what is the value of $(3A - B - \sqrt{15}C)$?

किसी $(5\sqrt{5}x^3 - 3\sqrt{3}y^3) \div (\sqrt{5}x - \sqrt{3}y) = (Ax^2 + By^2 + Cxy)$ है। $(3A - B - \sqrt{15}C)$ का मान ज्ञात करें।

SSC CPO 25/11/2020 (Shift-1)

- (a) 12 (b) 8
(c) -3 (d) -5

49. If $x^4 + x^{-4} = 194$, $x > 0$, then what is the value of $x + \frac{1}{x} + 2$?

किसी $x^4 + x^{-4} = 194$, $x > 0$ है। $x + \frac{1}{x} + 2$ का मान ज्ञात करें।

SSC CPO 25/11/2020 (Shift-1)

- (a) 6 (b) 8
(c) 4 (d) 14

50. If $a^2 + b^2 = 82$ and $ab = 9$, then a possible value of $a^3 + b^3$ is:

किसी $a^2 + b^2 = 82$ और $ab = 9$ है। $a^3 + b^3$ का एक संभव मान ज्ञात करें।

SSC CPO 25/11/2020 (Shift-2)

- (a) 720 (b) 830
(c) 750 (d) 730

51. If $x + y + z = 19$, $xyz = 216$ and $xy + yz + zx = 114$, then the value of $\sqrt{x^3 + y^3 + z^3 + xyz}$ is:

किसी $x + y + z = 19$, $xyz = 216$ और $xy + yz + zx = 114$ है। $\sqrt{x^3 + y^3 + z^3 + xyz}$ का मान ज्ञात करें।

SSC CPO 25/11/2020 (Shift-2)

- (a) 32 (b) 28
(c) 30 (d) 35

52. If $a + b + c = 0$, then the value of $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab}$ is:

किसी $a + b + c = 0$ है। $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab}$ का मान ज्ञात करें।

SSC CPO 25/11/2020 (Shift-2)

- (a) 0 (b) 3
(c) 1 (d) -1

53. $(4x^3y - 6x^2y^2 + 4xy^3 - y^4)$ can be expressed as:

$(4x^3y - 6x^2y^2 + 4xy^3 - y^4)$ को निम्नलिखित में से किसी एक के रूप में व्यक्त करें।

SSC CPO 09/12/2019 (Shift-01)

- (a) $(x + y)^4 - x^4$ (b) $(x + y)^4 - y^4$
(c) $(x - y)^4 - x^4$ (d) $x^4 - (x - y)^4$

54. If $(2x + 3y + 4)(2x + 3y - 5)$ is equivalent to $(ax^2 + by^2 + 2hxy + 2gx + 2fy + c)$, then what is the value of $(g + f - c)/(abh)$?

किसी $(2x + 3y + 4)(2x + 3y - 5)$, $(ax^2 + by^2 + 2hxy + 2gx + 2fy + c)$ के बराबर है। $(g + f - c)/(abh)$ का मान ज्ञात करें।

SSC CPO 09/12/2019 (Shift-01)

- (a) $\frac{37}{216}$ (b) $\frac{35}{432}$
(c) $\frac{19}{108}$ (d) $\frac{19}{216}$

55. If $x^4 + x^2y^2 + y^4 = 21$ and $x^2 + xy + y^2 = 3$, then what is the value of $4xy$?

किसी $x^4 + x^2y^2 + y^4 = 21$ और $x^2 + xy + y^2 = 3$ है। $4xy$ का मान ज्ञात करें।

SSC CPO 09/12/2019 (Shift-02)

- (a) 12 (b) 4
(c) -8 (d) -4

56. If $x^2 - \sqrt{7}x + 1 = 0$, then $(x^3 + x^{-3}) = ?$

किसी $x^2 - \sqrt{7}x + 1 = 0$ है। $(x^3 + x^{-3}) = ?$

SSC CPO 09/12/2019 (Shift-02)

- (a) $10\sqrt{7}$ (b) $4\sqrt{7}$
(c) $7\sqrt{7}$ (d) $3\sqrt{7}$

57. If $x + y + z = 10$, $xy + yz + zx = 25$ and $xyz = 100$, then what is the value of $(x^3 + y^3 + z^3)$?

किसी $x + y + z = 10$, $xy + yz + zx = 25$ और $xyz = 100$ है। $(x^3 + y^3 + z^3)$ का मान ज्ञात करें।

SSC CPO 09/12/2019 (Shift-02)

- (a) 450 (b) 540
(c) 550 (d) 570

58. If $x + y + z = 1$, $xy + yz + zx = -26$ and $x^3 + y^3 + z^3 = 151$, then what will be the value of xyz ?

किसी $x + y + z = 1$, $xy + yz + zx = -26$ और $x^3 + y^3 + z^3 = 151$ है। xyz का मान ज्ञात करें।

SSC CPO 11/12/2019 (Shift-01)

- (a) 24 (b) -30
(c) -18 (d) 32

59. If $a + b + c = 6$ and $a^2 + b^2 + c^2 = 38$, then what is the value of $a(b^2 + c^2) + b(c^2 + a^2) - c(a^2 + b^2) + 3abc$?

किसी $a + b + c = 6$ और $a^2 + b^2 + c^2 = 38$ है। $a(b^2 + c^2) + b(c^2 + a^2) - c(a^2 + b^2) + 3abc$ का मान ज्ञात करें।

SSC CPO 11/12/2019 (Shift-01)

- (a) 3 (b) -3
(c) 6 (d) -6
60. If $(2x - 5y)^3 - (2x + 5y)^3 = y(Ax^2 + By^2)$, then what is the value of $(2A - B)$?
- फि की $(2x - 5y)^3 - (2x + 5y)^3 = y(Ax^2 + By^2)$ की रक्ख $(2A - B)$ न भे खे दरी ने कर्ब
- SSC CPO 11/12/2019 (Shift-01)**
- (a) 25 (b) 40
(c) 15 (d) 10
61. If $\sqrt{x} + \frac{1}{\sqrt{x}} = 3, x > 0$, then $x^2 (x^2 - 47) = ?$
- फि की $\sqrt{x} + \frac{1}{\sqrt{x}} = 3, x > 0$ की रक्ख $x^2 (x^2 - 47) = ?$
- SSC CPO 11/12/2019 (Shift-02)**
- (a) 0 (b) 2
(c) -2 (d) -1
62. If x and y are real numbers, then the least possible value of $4(x - 2)^2 + (y - 3)^2 - 2(x - 3)^2$ is:
- फि की x की y की रक्ख $4(x - 2)^2 + (y - 3)^2 - 2(x - 3)^2$ न भे खे दरी ने कर्ब
- SSC CPO 11/12/2019 (Shift-02)**
- (a) 3 (b) -4
(c) 1 (d) -8
63. If $x = 5.51, y = 5.52$ and $z = 5.57$, then what is the value of $x^3 + y^3 + z^3 - 3xyz$?
- फि की $x = 5.51, y = 5.52$ की $z = 5.57$ की रक्ख $x^3 + y^3 + z^3 - 3xyz$ न भे खे दरी ने कर्ब
- SSC CPO 11/12/2019 (Shift-02)**
- (a) 5.146 (b) 51.46
(c) 0.05146 (d) 0.5146
64. If $x^4 + x^2 y^2 + y^4 = \frac{21}{256}$ and $x^2 + xy + y^2 = \frac{3}{16}$, then $2(x^2 + y^2) = ?$
- फि की $x^4 + x^2 y^2 + y^4 = \frac{21}{256}$ की $x^2 + xy + y^2 = \frac{3}{16}$ की रक्ख $2(x^2 + y^2) = ?$
- SSC CPO 12/12/2019 (Shift-01)**
- (a) $\frac{3}{8}$ (b) $\frac{5}{8}$
(c) $\frac{3}{4}$ (d) $\frac{5}{16}$

65. If $\frac{8x}{2x^2 + 7x - 2} = 1, x > 0$, then what is the value of $x^3 + \frac{1}{x^3}$?
- फि की $\frac{8x}{2x^2 + 7x - 2} = 1, x > 0$ की रक्ख $x^3 + \frac{1}{x^3}$ न भे खे दरी ने कर्ब
- SSC CPO 12/12/2019 (Shift-01)**
- (a) $\frac{3}{8}\sqrt{17}$ (b) $\frac{3}{4}\sqrt{17}$
(c) $\frac{5}{8}\sqrt{17}$ (d) $\frac{5}{4}\sqrt{17}$
66. If $a = 500, b = 502$ and $c = 504$, then the value of $a^3 + b^3 + c^3 - 3abc$ is:
- फि की $a = 500, b = 502$ की $c = 504$ की रक्ख $a^3 + b^3 + c^3 - 3abc$ न भे खे दरी ने कर्ब
- SSC CPO 12/12/2019 (Shift-01)**
- (a) 15060 (b) 12048
(c) 18072 (d) 17040
67. If $a - b = 5$ and $a^2 + b^2 = 45$, then the value of ab is:
- फि की $a - b = 5$ की $a^2 + b^2 = 45$ की रक्ख ab न भे खे दरी ने कर्ब
- SSC CPO 12/12/2019 (Shift-02)**
- (a) 25 (b) 10
(c) 15 (d) 20
68. If $x^4 + x^{-4} = 2599$, then one of the values of $x - x^{-1}$, where $x > 0$, is equal to:
- फि की $x^4 + x^{-4} = 2599$ की रक्ख $x - x^{-1}$ न भे खे दरी ने कर्ब
- SSC CPO 12/12/2019 (Shift-02)**
- (a) 9 (b) 7
(c) 5 (d) 8
69. If $a + b + c = 9$ and $ab + bc + ca = 18$, then the value of $a^3 + b^3 + c^3 - abc$ is:
- फि की $a + b + c = 9$ की $ab + bc + ca = 18$ की रक्ख $a^3 + b^3 + c^3 - abc$ न भे खे दरी ने कर्ब
- SSC CPO 12/12/2019 (Shift-02)**
- (a) 243 (b) 254
(c) 234 (d) 244
70. If $x^2 - 4x + 1 = 0$, then what is the value of $(x^6 + x^{-6})$?
- फि की $x^2 - 4x + 1 = 0$ की रक्ख $(x^6 + x^{-6})$ न भे खे दरी ने कर्ब
- SSC CPO 13/12/2019 (Shift-01)**

- (a) 2786 (b) 2702
(c) 2716 (d) 2744
71. If $\left(x^3 + \frac{1}{x^3} - k\right)^2 + \left(x + \frac{1}{x} - p\right)^2 = 0$, where k and p are real numbers and $x \neq 0$, then $\frac{k}{p}$ is equal to:
- फि की $\left(x^3 + \frac{1}{x^3} - k\right)^2 + \left(x + \frac{1}{x} - p\right)^2 = 0$ की रक्ख $\frac{k}{p}$ न भे खे दरी ने कर्ब
- SSC CPO 13/12/2019 (Shift-01)**
- (a) $p^2 + 1$ (b) $p^2 + 3$
(c) $p^2 - 1$ (d) $p^2 - 3$
72. If $x^4 + x^2 y^2 + y^4 = 133$ and $x^2 - xy + y^2 = 7$, then what is the value of xy ?
- फि की $x^4 + x^2 y^2 + y^4 = 133$ की $x^2 - xy + y^2 = 7$ की रक्ख xy न भे खे दरी ने कर्ब
- SSC CPO 13/12/2019 (Shift-01)**
- (a) 8 (b) 12
(c) 4 (d) 6
73. If $a + b + c = 19, ab + bc + ca = 120$, then what is the value of $a^3 + b^3 + c^3 - 3abc$?
- फि की $a + b + c = 19, ab + bc + ca = 120$ की रक्ख $a^3 + b^3 + c^3 - 3abc$ न भे खे दरी ने कर्ब
- SSC CPO 13/12/2019 (Shift-02)**
- (a) 31 (b) 23
(c) 19 (d) 18
74. If $x^6 - 512y^6 = (x^2 - Ay^2)(x^4 + Bx^2y^2 + Cy^4)$, then what is the value of $(A + B - C)$?
- फि की $x^6 - 512y^6 = (x^2 - Ay^2)(x^4 + Bx^2y^2 + Cy^4)$ की रक्ख $(A + B - C)$ न भे खे दरी ने कर्ब
- SSC CPO 13/12/2019 (Shift-02)**
- (a) -72 (b) 72
(c) -80 (d) 48
75. Solve the following:
- कस कसरी न की 2 न हस
- $(a + b + c)(ab + bc + ca) - abc = ?$
- SSC CPO 13/12/2019 (Shift-02)**
- (a) $(a + b)(b + c)(c - a)$
(b) $(a - b)(b - c)(c - a)$
(c) $(a + b)(b - c)(c + a)$
(d) $(a + b)(b + c)(c + a)$

ANSWER KEY

1.(b)	2.(a)	3.(a)	4.(d)	5.(d)	6.(a)	7.(c)	8.(a)	9.(d)	10.(a)
11.(b)	12.(c)	13.(c)	14.(c)	15.(a)	16.(d)	17.(a)	18.(c)	19.(b)	20.(a)
21.(b)	22.(a)	23.(c)	24.(a)	25.(d)	26.(c)	27.(d)	28.(b)	29.(d)	30.(c)
31.(a)	32.(b)	33.(a)	34.(a)	35.(a)	36.(a)	37.(a)	38.(a)	39.(d)	40.(c)
41.(b)	42.(d)	43.(a)	44.(d)	45.(d)	46.(d)	47.(b)	48.(c)	49.(a)	50.(d)
51.(d)	52.(b)	53.(d)	54.(b)	55.(c)	56.(b)	57.(c)	58.(a)	59.(d)	60.(d)
61.(d)	62.(b)	63.(c)	64.(b)	65.(c)	66.(c)	67.(b)	68.(b)	69.(a)	70.(b)
71.(d)	72.(d)	73.(c)	74.(c)	75.(d)					

SOLUTIONS

1. (b) $a + b = 10$, $ab = 6$

$$a^3 + b^3 = (a + b) \{ (a + b)^2 - 3ab \}$$

$$\Rightarrow 10 \{ (10)^2 - 3 \times 6 \} = 10 \times 82$$

$$= 820$$

2. (a) ATQ,

$$\frac{x}{y} + \frac{y}{x} = 1, \quad x + y = 2$$

$$\Rightarrow x^2 + y^2 = xy, \quad x^2 + y^2 - xy = 0$$

$$x^3 + y^3 = (x + y) (x^2 + y^2 - xy)$$

$$= 2(0) = 0$$

3. (a) $\frac{A}{L} + \frac{M}{B} = 1$

Let,

$$\frac{A}{L} = x, \quad \frac{M}{B} = y \text{ and } \frac{C}{N} = z$$

ATQ,

$$\frac{A}{L} + \frac{M}{B} = 1$$

$$x + y = 1$$

$$x = 1 - y$$

$$\frac{1}{x} = \frac{1}{1 - y} \quad \dots\dots(i)$$

Again,

$$\frac{B}{M} + \frac{N}{C} = 1$$

$$\frac{1}{y} + \frac{1}{z} = 1$$

$$\frac{1}{z} = 1 - \frac{1}{y} = \frac{y - 1}{y}$$

$$z = \frac{y}{y - 1} \quad \dots\dots(ii)$$

Put the value from equation (i) and (ii)

$$\frac{L}{A} + \frac{C}{N}$$

$$= \frac{1}{x} + z = \frac{1}{1 - y} + \frac{y}{y - 1}$$

$$= \frac{1 - y}{1 - y} = 1$$

4. (d) $x \left(5 - \frac{2}{x} \right) = \frac{5}{x}$

$$\Rightarrow 5x - 2 = \frac{5}{x}$$

$$\Rightarrow 5x - \frac{5}{x} = 2$$

$$\text{ie, } x - \frac{1}{x} = \frac{2}{5}$$

$$\Rightarrow x^2 + \frac{1}{x^2} = \left(x - \frac{1}{x} \right)^2 + 2$$

$$= \frac{4}{25} + 2 = \frac{54}{25}$$

5. (d) If $a + \frac{1}{a} = x$

$$\text{then } a^2 + \frac{1}{a^2} = x^2 - 2$$

$$a + \frac{1}{a} = 3$$

Square both side

$$a^2 + \frac{1}{a^2} = 7$$

Again,

Square both side

$$a^4 + \frac{1}{a^4} = 47$$

6. (a) $a + b + c = 5$

$$ab + bc + ca = 7$$

$$\therefore a^3 + b^3 + c^3 - 3abc = (a + b + c) \{ (a + b + c)^2 - 3(ab + bc + ca) \}$$

$$= 5 \times (25 - 3 \times 7) = 5 \times 4 = 20$$

7. (c) $a - \frac{1}{a} = 4$

$$a + \frac{1}{a} = \sqrt{\left(a - \frac{1}{a} \right)^2 + 4}$$

$$= \sqrt{16 + 4} = \sqrt{20} = 2\sqrt{5}$$

8. (a) Given,

$$a - \frac{1}{a-5} = 10$$

$$(a-5) - \frac{1}{(a-5)} = 5$$

We know that, $a - \frac{1}{a} = k$ then

$$a^3 - \frac{1}{a^3} = k^3 + 3k.$$

Hence,

$$(a-5)^3 - \frac{1}{(a-5)^3} = 5^3 + 3 \times 5$$

$$= 125 + 15 = 140$$

9. (d) Given,

$$x^4 + \frac{1}{x^4} = 1154$$

$$\Rightarrow x^2 + \frac{1}{x^2} = \sqrt{1154+2}$$

$$\Rightarrow x^2 + \frac{1}{x^2} = \sqrt{1156}$$

$$\Rightarrow x^2 + \frac{1}{x^2} = 34$$

Similarly,

$$x + \frac{1}{x} = \sqrt{34+2}$$

$$\Rightarrow x + \frac{1}{x} = 6$$

$$\text{Hence, } x^3 + \frac{1}{x^3} = (6)^3 - 3 \times 6 = 198$$

10. (a) Given,

$$x^4 + x^{-4} = 7$$

$$x^2 + x^{-2} = \sqrt{7+2}$$

$$x^2 + x^{-2} = 3$$

$$\text{The value of } x^2 + \frac{1}{x^2} - 2 = 3 - 2 = 1$$

11. (b) Given,

$$a + b + c = 10$$

$$a^2 + b^2 + c^2 = 48$$

We know that,

$$(a+b+c)^2 = a^2 + b^2 + c^2 + 2(ab+bc+ca)$$

$$\Rightarrow (10)^2 = 48 + 2(ab+bc+ca)$$

$$\Rightarrow 100 - 48 = 2(ab+bc+ca)$$

$$\Rightarrow 52 = 2(ab+bc+ca)$$

$$\Rightarrow ab+bc+ca = 26$$



SMART APPROACH:-

Let, $c = 0$
then, $a + b = 10$, $a^2 + b^2 = 48$
 $(a+b)^2 = a^2 + b^2 + 2ab$
 $2ab = (10)^2 - 48$
 $ab = 26$

12. (c) We know that,

If $a + b + c = 0$ then $a^3 + b^3 + c^3 = 3abc$

$$= \frac{(x-y)^3 + (y-z)^3 + (z-x)^3}{(x^2-y^2) + (y^2-z^2) + (z^2-x^2)}$$

$$= \frac{3(x-y)(y-z)(z-x)}{(x^2-y^2)(y^2-z^2)(z^2-x^2)}$$

$$= \frac{3(x-y)(y-z)(z-x)}{3(x-y)(y-z)(z-x)(x+y)(y+z)(z+x)}$$

$$= \frac{1}{(x+y)(y+z)(z+x)}$$

13. (c) Given,

$$a + b + c = 10$$

$$a^2 + b^2 + c^2 = 38$$

We know that,

$$(a+b+c)^2 = a^2 + b^2 + c^2 + 2(ab+bc+ca)$$

$$\Rightarrow (10)^2 = 38 + 2(ab+bc+ca)$$

$$\Rightarrow 100 - 38 = 2(ab+bc+ca)$$

$$\Rightarrow 62 = 2(ab+bc+ca)$$

$$\Rightarrow 31 = ab+bc+ca$$

$$\therefore (a-b)^2 + (b-c)^2 + (c-a)^2$$

$$= a^2 + b^2 - 2ab + b^2 + c^2 - 2bc + c^2 + a^2 - 2ca$$

$$= 2(a^2 + b^2 + c^2) - 2(ab+bc+ca)$$

$$= 2(38) - 2(31) = 76 - 62 = 14$$



SMART APPROACH:-

By value putting,
 $a = 5$, $b = 3$, $c = 2$
 $\therefore (a-b)^2 + (b-c)^2 + (c-a)^2$
 $= 2^2 + 1^2 + 3^2 = 14$

$$14. (c) \frac{\{(m^2+n^2)(m-n) - (m-n)^3\}}{(m^2n - mn^2)}$$

$$= \frac{(m-n)\{(m^2+n^2) - (m-n)^2\}}{mn(m-n)}$$

$$= \frac{m^2+n^2 - (m^2+n^2-2mn)}{mn}$$

$$= \frac{2mn}{mn} = 2$$

15. (a) We know, $(a+b)(a-b)$

$$= a^2 - b^2$$

$$16y^2 - k = \left(4y + \frac{3}{2}\right)\left(4y - \frac{3}{2}\right)$$

$$\Rightarrow 16y^2 - k = (4y)^2 - \left(\frac{3}{2}\right)^2$$

On comparing

$$k = \frac{9}{4}$$

16. (d) Given,

$$x + y + z = 8$$

$$x^2 + y^2 + z^2 = 20$$

We know that,

$$(x+y+z)^2$$

$$= x^2 + y^2 + z^2 + 2(xy+yz+zx)$$

$$\Rightarrow 64 = 20 + 2(xy+yz+zx)$$

$$\Rightarrow 64 - 20 = 2(xy+yz+zx)$$

$$\Rightarrow 44 = 2(xy+yz+zx)$$

$$\Rightarrow 22 = xy+yz+zx$$

$$\therefore x^3 + y^3 + z^3 - 3xyz$$

$$= (x+y+z) \{x^2 + y^2 + z^2 - (xy+yz+zx)\}$$

$$= 8\{20 - 22\} = -16$$



SMART APPROACH:-

Here the given equation is of three variables and the number of the equation is two.

In this case we assume the value of 1 term is 0.

Assume $z = 0$

Now, $x + y = 8$

$$x^2 + y^2 = 20$$

$$(x+y)^2 = x^2 + y^2 + 2xy$$

$$\Rightarrow 64 = 20 + 2xy$$

$$\Rightarrow 64 - 20 = 2xy$$

$$\Rightarrow 44 = 2xy$$

$$\Rightarrow xy = 22$$

Hence,

$$x^3 + y^3 + z^3 - 3xyz = x^3 + y^3$$

$$x^3 + y^3 = (x+y)(x^2 + y^2 - xy)$$

$$= 8(20 - 22) = 8 \times -2 = -16$$

17. (a) We know that,

$$(a+b)^2 + (a-b)^2 = 2(a^2 + b^2)$$

$$\therefore (7x+4y)^2 + (7x-4y)^2$$

$$= 2\{(7x)^2 + (4y)^2\}$$

$$= 98x^2 + 32y^2$$

18. (c) $6x + 7y = 5xy$ (1)

$$10y - 4x = 4xy$$
(2)

On dividing equation (1) and (2) by xy , we get

$$\frac{6}{y} + \frac{7}{x} = 5$$
(3)

$$\text{and } \frac{10}{x} - \frac{4}{y} = 4$$
(4)

Again multiplying equation (3) and equation (4) by 10 and 7 respectively

$$\frac{60}{y} + \frac{70}{x} = 50$$

$$\frac{70}{x} - \frac{28}{y} = 28$$

On subtracting, we get:

$$\frac{60}{y} + \frac{70}{x} - \left(\frac{70}{x} - \frac{28}{y} \right) = 50 - 28$$

$$\Rightarrow \frac{88}{y} = 22$$

$$\Rightarrow y = 4$$

On putting $y = 4$ in equation (3), we get $x = 2$

Hence, $x = 2$ and $y = 4$



SMART APPROACH:-

We can Assume value of x and y respectively 2 and 4

Now

Put the value of x and y 2 and 4 then satisfy the eqⁿ. (i)

$$6x + 7y = 5xy$$

$$12 + 28 = 5 \times 2 \times 4$$

$$40 = 40 \text{ Satisfy}$$

eqn. (ii)

$$10 \times 4 - 4 \times 2 = 4 \times 24$$

$$32 = 32 \text{ Satisfy}$$

Hence,

The value of x and y is 2 and 4

19. (b) Given,

$$x + y = 10 \quad \dots(1)$$

$$2xy = 48$$

$$\Rightarrow xy = 24 \quad \dots(2)$$

Assume, such a value of x and y which satisfies equation (1) & (2).

$$x = 6 \text{ and } y = 4$$

$$\therefore 2x - y = 2(6) - 4 = 8$$



SMART APPROACH:-

We can Assume value of x and y respectively 6 and 4

Now, putting the value of x and y in eqⁿ.

$$x + y = 10$$

$$6 + 4 = \text{Satisfy}$$

$$2xy = 48$$

$$2xy \times 4 = 48 \text{ Satisfy}$$

Now,

$$2x - y = 2 \times 6 - 4 = 8$$

20. (a) Put $b = 0$, $a^2 + 0 + 1 = 2a$

$$\Rightarrow a^2 - 2a + 1 = 0$$

$$\Rightarrow (a - 1)^2 = 0$$

$$\Rightarrow a = 1$$

$$\text{Therefore, } a^4 + b^7 = 1^4 + 0^7 = 1$$

21. (b) Special Case:

$$\text{If } x + \frac{1}{x} = 2 \text{ then } x = 1$$

$$\text{Put } x = 1 \text{ in } x^4 + \frac{1}{x^4} = 2$$

22. (a) Put $a = 2$, $b = -1$ and $c = -1$

$$\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab} = \frac{4}{1} + \frac{1}{-2} + \frac{1}{-2}$$

$$= 4 - 1 = 3$$

23. (c) Given, $\frac{x^8 + 1}{x^4} = 4$

$$\Rightarrow x^4 + \frac{1}{x^4} = 14$$

$$\Rightarrow x^2 + \frac{1}{x^2} = 4$$

$$\therefore x^6 + \frac{1}{x^6} = (4)^3 - 3 \times 4$$

$$\Rightarrow \frac{x^{12} + 1}{x^6} = 64 - 12 = 52$$

24. (a) $(x + y)^3 - (x - y)^3 - 6y(x^2 - y^2)$
 $= x^3 + y^3 + 3xy(x + y) - \{x^3 - y^3 - 3xy(x - y)\} - 6yx^2 + 6y^3$
 $= x^3 + y^3 + 3x^2y + 3xy^2 - \{x^3 - y^3 - 3x^2y + 3xy^2\} - 6yx^2 + 6y^3$
 $= x^3 + y^3 + 3x^2y + 3xy^2 - x^3 + y^3 + 3x^2y - 3xy^2 - 6yx^2 + 6y^3$
 $= 8y^3$



SMART APPROACH:-

Put $x = 0$, $y = 1$

$$(x + y)^3 - (x - y)^3 - 6y(x^2 - y^2)$$

$$1 + 1 - 6 = 8$$

Putting the value of x and y in option (a) then satisfy the eqⁿ.

25. (d) $x^2 + 6x + 1 = 0$

$$x(x + 6) + 1 = 0$$

Dividing both side by $(x + 6)$

$$x + \frac{1}{x + 6} = 0$$

Adding 6 both sides

$$(x + 6) + \frac{1}{(x + 6)} = 6$$

$$(x + 6)^3 + \frac{1}{(x + 6)^3} = 6^3 - 3 \times 6$$

$$= 216 - 18 = 198$$

26. (c) Given,

$$a + b = 10 \text{ and } ab = 9$$

We know,

$$(a - b)^2 = (a + b)^2 - 4ab$$

$$= 100 - 36 = 64$$

$$\therefore a - b = 8$$



SMART APPROACH:-

By value putting,

$$a = 9, b = 1$$

$$\therefore a - b = 9 - 1 = 8$$

27. (d) Given,

$$a^2 + b^2 = 82$$

$$b^2 + c^2 = 65$$

Assume, $a = 9$, $b = 1$ and $c = 8$

$$\therefore 2a + 7b - 3c = 2(9) + 7(1) - 3(8)$$

$$= 18 + 7 - 24 = 1$$

28. (b) Given, $x(x - 5) = -1$

$$\Rightarrow x - 5 = \frac{-1}{x}$$

$$\Rightarrow x + \frac{1}{x} = 5$$

$$\Rightarrow x^3 + \frac{1}{x^3} = 5^3 - 3 \times 5$$

$$\Rightarrow x^3 + \frac{1}{x^3} = 110$$

$$\Rightarrow x^6 + 1 = 110x^3$$

$$\Rightarrow x^6 - 110x^3 = -1$$

$$\Rightarrow x^3(x^3 - 110) = -1$$

29. (d) Given,

$$r = 55$$

$$\therefore r(r^2 + 3r + 3)$$

$$= \{r^3 + 3r^2 + 3r + 1\} - 1$$

$$= \{r^3 + 1 + 3r(r + 1)\} - 1$$

$$= (r + 1)^3 - 1 = 56^3 - 1$$

$$= 175616 - 1 = 175615$$



SMART APPROACH:-

We can get the direct result by divisibility rule 11 and 5 together

On only option (d) is correct

30. (c) Given

$$a + \frac{1}{a} = P^2$$

$$\Rightarrow a^2 + \frac{1}{a^2} = P^4 - 2$$

31. (a) Given $a = 9.6$, $b = 4.44$ and $c = 5.16$

We know that

$$\text{If } a + b + c = 0 \text{ then, } a^3 - b^3 - c^3 - 3abc = 0$$

Here,

$$a - b - c = 9.6 - 4.44 - 5.16 = 0$$

$$\text{Therefore, } a^3 - b^3 - c^3 - 3abc = 0$$



SMART APPROACH:-

We know that,

$$\text{If } a - b - c = 0 \text{ then } a^3 - b^3 - c^3 - 3abc = 0$$

Here,

$$a = 9.6, b = 4.44 \text{ and } c = 5.16$$

$$a - b - c = 9.6 - 4.44 - 5.16 = 0$$

Now,

$$a^3 + b^3 - c^3 - 3abc = 0$$

32. (b) Given

$$S - \frac{1}{S - 8} = 20$$

$$\Rightarrow (S - 8) - \frac{1}{(S - 8)} = 12$$

$$\therefore (S - 8)^3 - \frac{1}{(S - 8)^3}$$

$$= 12^3 + 3 \times 12 = 1728 + 36 = 1764$$

33. (a) Given

$$x^2 + \frac{1}{x^2} = 98$$

$$\Rightarrow x + \frac{1}{x} = \sqrt{98+2} = \sqrt{100} = 10$$

34. (a) $k(21x^2 + 24) + rx + (14x^2 - 9) = 0$

$$\Rightarrow 21kx^2 + 24k + rx + 14x^2 - 9 = 0$$

$$\Rightarrow (21k + 14)x^2 + rx + 24k - 9 = 0$$

.....(1)

$$k(7x^2 + 8) + px + (2x^2 - 3) = 0$$

$$\Rightarrow 7kx^2 + 8k + px + 2x^2 - 3 = 0$$

$$\Rightarrow (7k + 2)x^2 + px + 8k - 3 = 0 \dots(2)$$

On dividing (1) by (2), we get-

$$\Rightarrow \frac{21k+14}{7k+2} = \frac{r}{p} = \frac{24k-9}{8k-3}$$

$$\Rightarrow \frac{r}{p} = \frac{3(8k-3)}{8k-3}$$

$$\Rightarrow \frac{r}{p} = 3 \Rightarrow \frac{p}{r} = \frac{1}{3}$$

35. (a) $a^2 + b^2 + c^2 + 216 = 2(6a + 6b - 12c)$

$$(a-6)^2 + (b-6)^2 + (c+12)^2 = 0$$

then

$$a = 6, b = 6, c = -12$$

Now,

$$= \sqrt{ab - bc + ca}$$

$$= \sqrt{6 \times 6 - (6) \times (-12) + (-12) \times (6)}$$

$$= \sqrt{36 + 72 - 72} = 6$$

36. (a) $(5\sqrt{5}x^3 - 3\sqrt{3}y^3) \div (\sqrt{5}x - \sqrt{3}y)$

$$= Ax^2 + By^2 + Cxy$$

$$(3A + B - \sqrt{15}C) = ?$$

$$\therefore a^3 - b^3 = (a-b)(a^2 + b^2 + ab)$$

$$\frac{(\sqrt{5}x - \sqrt{3}y)(5x^2 + 3y^2 + \sqrt{15}xy)}{\sqrt{5}x - \sqrt{3}y}$$

$$= Ax^2 + By^2 + Cxy$$

On comparing

$$A = 5, B = 3, y = +\sqrt{15}$$

$$3A + B - \sqrt{15}C$$

$$= 3 \times 5 + 3 - \sqrt{15} \times \sqrt{15}$$

$$= 15 + 3 - 15 = 3$$

37. (a) $x^4 + \frac{1}{x^4} = 194, x + \frac{1}{x} = ?$

$$x^4 + \frac{1}{x^4} + 2 = 196$$

$$x^2 + \frac{1}{x^2} = 14$$

$$x + \frac{1}{x} = 4$$

38. (a) $x^2 + 8y^2 - 12y - 4xy + 9 = 0,$
 $(7x - 8y) = ?$

$$x^2 - 4xy + 4y^2 + 4y^2 - 12y + 9 = 0$$

$$(x - 2y)^2 + (2y - 3)^2 = 0$$

$$x - 2y = 0$$

$$x = 2y$$

$$2y - 3 = 0$$

$$y = \frac{3}{2}$$

$$x = 2 \times \frac{3}{2} \quad x = 3, y = \frac{3}{2}$$

$$7x - 8y = 7 \times 3 - 8 \times \frac{3}{2}$$

$$= 21 - 12 = 9$$

39. (d) $x^2 - 5x + 1 = 0,$

$$\left(x^4 + \frac{1}{x^2}\right) \div (x^2 + 1) = ?$$

$$x + \frac{1}{x} = 5$$

$$\Rightarrow \frac{\left(x^4 + \frac{1}{x^2}\right) \times \frac{1}{x}}{\left(x^2 + 1\right) \times \frac{1}{x}} \Rightarrow \frac{\left(x^3 + \frac{1}{x^3}\right)}{\left(x + \frac{1}{x}\right)}$$

$$\therefore x + \frac{1}{x} = 5$$

$$x^3 + \frac{1}{x^3} = 110$$

$$\frac{\left(x^3 + \frac{1}{x^3}\right)}{\left(x + \frac{1}{x}\right)} = \frac{110}{5} = 22$$

40. (c) $(x + y + z)^2 = x^2 + y^2 + z^2 + 2(xy + yz + zx)$

$$361 = x^2 + y^2 + z^2 + 2 \times 114$$

$$x^2 + y^2 + z^2 = 133$$

$$x^3 + y^3 + z^3 - 3xyz = (x + y + z)$$

$$[x^2 + y^2 + z^2 - (xy + yz + zx)]$$

$$x^3 + y^3 + z^3 + xyz$$

$$= 19 \times [133 - 114] + 216 + 648$$

$$x^3 + y^3 + z^3 + xyz = 1225$$

Alternate Method:

$$a^3 + b^3 + c^3 - 3abc = (a + b + c)$$

$$[(a + b + c)^2 - 3(ab + bc + ca)]$$

$$\therefore x^3 + y^3 + z^3 + xyz = (19)[(19)^2 - 3 \times 114] + 216 + 648 = 1225$$



SMART APPROACH:-

Value putting,

$$a = 6, b = 4, c = 9$$

$$\therefore x^3 + y^3 + z^3 + xyz = 1225$$

41. (b) $x^2 - 3x + 1 = 0, \frac{\left(x^4 + \frac{1}{x^2}\right)}{(x^2 + 1)} = ?$

$$x + \frac{1}{x} = 3$$

$$\therefore x^3 + \frac{1}{x^3} = 27 - 9 = 18$$

$$\frac{\left(x^4 + \frac{1}{x^2}\right) \times \frac{1}{x}}{(x^2 + 1) \times \frac{1}{x}} = \frac{x^3 + \frac{1}{x^3}}{x + \frac{1}{x}} = \frac{18}{3} = 6$$

42. (d) $x^2 + y^2 + z^2 = (x + y + z)^2 - 2(xy + yz + zx)$

$$= 289 - 2 \times 111$$

$$= 289 - 222 = 67$$

$$x^3 + y^3 + z^3 - 3xyz = (x + y + z) [x^2 + y^2 + z^2 - (xy + yz + zx)]$$

$$x^3 + y^3 + z^3 + xyz = (x + y + z) [x^2 + y^2 + z^2 - (xy + yz + zx)] + 4xyz$$

$$= 17[67 - 111] + 4 \times 171$$

$$= -17 \times 44 + 684$$

$$= -748 + 684 = -64$$

$$x^3 + y^3 + z^3 + xyz = -64$$

$$\sqrt[3]{x^2 + y^2 + z^2 + xyz} = \sqrt[3]{-64} = -4$$



SMART APPROACH:-

$$a^3 + b^3 + c^3 - 3abc = (a + b + c)$$

$$[(a + b + c)^2 - 3(ab + bc + ca)]$$

$$\therefore x^2 + y^2 + z^2 + xyz = (17)[(17)^2 - 3 \times 111] + 171 + 513 = -64$$

$$\sqrt[3]{x^3 + y^3 + z^3 + xyz} = -4$$

43. (a) $x^2 + 8y^2 + 12y - 4xy + 9 = 0,$
 $(7x + 8y) = ?$

$$x^2 - 4xy + 4y^2 + 4y^2 + 12y + 9 = 0$$

$$(x - 2y)^2 + (2y + 3)^2 = 0$$

$$x = 2y, y = \frac{-3}{2}$$

$$x = -3, y = \frac{-3}{2}$$

$$7x + 8y = 7 \times -3 + 8 \times \frac{-3}{2} = -33$$

44. (d) $(xy + yz + zx)$

$$= \frac{(x + y + z)^2 - (x^2 + y^2 + z^2)}{2}$$

$$= \frac{169 - 133}{2} = 18$$

$$x^3 + y^3 + z^3 - 3xyz = (x + y + z)$$

$$[x^2 + y^2 + z^2 - (xy + yz + zx)]$$

$$xyz =$$

$$\frac{x^3 + y^3 + z^3 - (x + y + z)[x^2 + y^2 + z^2 - (xy + yz + zx)]}{3}$$

$$= \frac{847 - 13[133 - 18]}{3}$$

$$= \frac{847 - 1495}{3}$$

$$xyz = -216$$

$$\sqrt[3]{xyz} = \sqrt[3]{-216} = -6$$

SMART APPROACH:-

$$a^3 + b^3 + c^3 - 3abc = \frac{1}{2} (a + b + c) [3(a^2 + b^2 + c^2) - (a + b + c)^2]$$

$$847 - 3xyz = \frac{1}{2} \times 13 [3 \times 133 - 169]$$

$$\sqrt[3]{xyz} = \sqrt[3]{-216} = -6$$

45. (d) $a^3 + b^3 = (a + b) [(a+b)^2 - 3ab]$
 $217 = 7[49 - 3ab]$
 $31 = [49 - 3ab]$
 $3ab = 18$
 $ab = 6$

SMART APPROACH:-

Value putting,
 $a = 6, b = 1$
 $\therefore ab = 6$

46. (d) $a^2 + b^2 + c^2 + 84 = 2(2a - 4b + 8c)$

$$(a - 2)^2 + (b + 4)^2 + (c - 8)^2 = 0$$

Then,

$$a = 2, b = -4, c = 8$$

$$= \sqrt{ab - bc + ca}$$

$$= \sqrt{2 \times -4 + 4 \times 8 + 8 \times 2}$$

$$= \sqrt{40} = 2\sqrt{10}$$

47. (b) $x + y + z = 19, x^2 + y^2 + z^2 = 133, xz = y^2, (x - z) = ?$
 $(xy + yz + zx) =$

$$\frac{(x + y + z)^2 - (x^2 + y^2 + z^2)}{2}$$

$$= \frac{361 - 133}{2}$$

$$xy + yz + zx = 114$$

$$\therefore zx = y^2$$

$$xy + yz + y^2 = 114$$

$$y(x + y + z) = 114$$

$$y = \frac{114}{19} = 6$$

$$x + 6 + z = 19$$

$$x + z = 13$$

$$xz = 36$$

$$(x - z)^2 = (x + z)^2 - 4xz$$

$$\Rightarrow 169 - 4 \times 36$$

$$\Rightarrow 169 - 144$$

$$(x - z) = 5$$



SMART APPROACH:-

Value putting, $x = 9, y = 6, z = 4$
 $\therefore x - z = 9 - 4 = 5$

48. (c) $\frac{(\sqrt{5}x - \sqrt{3}y)(5x^2 + 3y^2 + \sqrt{15}xy)}{(\sqrt{5}x - \sqrt{3}y)}$

$$= (Ax^2 + By^2 + Cxy)$$

On comparing

$$A = 5, B = 3, C = \sqrt{15}$$

Now,

$$3A - B - \sqrt{15}C$$

$$\Rightarrow 3 \times 5 - 3 - \sqrt{15} \times \sqrt{15}$$

$$\Rightarrow 15 - 3 - 15$$

$$\Rightarrow -3$$

49. (a) $x^4 + \frac{1}{x^4} = 194, x + \frac{1}{x} + 2 = ?$

$$\therefore x^2 + \frac{1}{x^2} = 14$$

$$x + \frac{1}{x} = 4$$

$$x + \frac{1}{x} + 2 = 6$$

50. (d) $\therefore (a + b)^2 = a^2 + b^2 + 2ab$
 $= 82 + 2 \times 9 = 100$
 $a + b = 10$
 $a^3 + b^3 = (a + b) (a^2 + b^2 - ab)$
 $= 10(82 - 9) = 730$



SMART APPROACH:-

Value putting, $a = 9, b = 1$
 $\therefore a^3 + b^3 = 730$

51. (d) $x^2 + y^2 + z^2 = (x + y + z)^2 - 2(xy + yz + zx)$
 $= 361 - 2 \times 114 = 133$

$$x^3 + y^3 + z^3 + xyz = (x + y + z) [x^2 + y^2 + z^2 - (xy + yz + zx)] + 4xyz$$

$$= 19[133 - 114] + 4 \times 216$$

$$= 19 \times 19 + 864$$

$$x^3 + y^3 + z^3 + xyz = 1225$$

$$\sqrt{x^3 + y^3 + z^3 + xyz} = \sqrt{1225} = 35$$



SMART APPROACH:-

Value putting, $x = 4, y = 6, z = 9$

$$\therefore \sqrt{x^3 + y^3 + z^3 + xyz} = \sqrt{1225} = 35$$

52. (b) If $a + b + c = 0$ then,
 $\therefore a^3 + b^3 + c^3 = 3abc$

$$\Rightarrow \frac{a^3 + b^3 + c^3}{abc} \Rightarrow \frac{3abc}{abc} = 3$$

53. (d) $(4x^3y - 6x^2y^2 + 4xy^3 - y^4)$
 We know,
 $(x - y)^4 = x^4 - 4x^3y + 6x^2y^2 - 4xy^3 + y^4$
 with option $= x^4 - (x - y)^4$ (satisfied)

54. (b) $(2x + 3y + 4)(2x + 3y - 5)$
 $4x^2 + 6xy - 10x + 6xy + 9y^2 - 15y + 8x + 12y - 20$

$$4x^2 + 9y^2 + 12xy - 2x - 3y - 20$$

Compare with

$$(ax^2 + by^2 + 2hxy + 2gx + 2fy + c)$$

$$a = 4, b = 9, h = 6, g = -1, f = \frac{-3}{2},$$

$$c = -20$$

Then,

$$= \frac{g + f - c}{abh} = \frac{-1 - \frac{3}{2} + 20}{4 \times 9 \times 6} = \frac{17.5}{216}$$

$$= \frac{35}{432}$$

55. (c) Given, that
 $x^4 + y^4 + x^2y^2 = 21, x^2 + y^2 + xy = 3$
 Then,
 $x^2 + y^2 - xy = 7$
 $xy = -2$ then $4xy = -8$



SMART APPROACH:-

We know that,

$$x^4 + x^2y^2 + y^4 = (x^2 + xy + y^2)(x^2 - xy + y^2)$$

Given,

$$x^4 + x^2y^2 + y^4 = 21$$

$$x^2 + xy + y^2 = 3 \dots \dots \dots (i)$$

$$x^2 - xy + y^2 = 7 \dots \dots \dots (ii)$$

$$(i) - (ii)$$

$$xy = 2$$

Now,

$$4xy = 4 \times (-2) = -8$$

56. (b) $x^2 - \sqrt{7}x + 1 = 0$

$$= x + \frac{1}{x} = \sqrt{7}x$$

$$x^3 + \frac{1}{x^3} = (\sqrt{7})^3 - 3 \times \sqrt{7}$$

$$= 7\sqrt{7} - 3\sqrt{7} = 4\sqrt{7}$$

57. (c) We know,
 $x^3 + y^3 + z^3 - 3xyz = (x + y + z) [(x + y + z)^2 - 3(xy + yz + zx)]$
 $x^3 + y^3 + z^3 - 3(100) = 10[(10)^2 - 3 \times 25]$
 $x^3 + y^3 + z^3 - 300 = 10[100 - 75]$
 $x^3 + y^3 + z^3 = 550$

58. (a) As we know,
 $x^3 + y^3 + z^3 - 3xyz = (x + y + z) [(x + y + z)^2 - 3(xy + yz + zx)]$
 $151 - 3xyz = 1[1 - 3 \times -26]$
 $-3xyz = 79 - 151$
 $3xyz = 79 - 151$
 $3xyz = 72$
 $xyz = 24$

59. (d) Given that,
 $a + b + c = 6$, $a^2 + b^2 + c^2 = 38$
 Let, $c = 0$
 Then,
 $a + b = 6$, $a^2 + b^2 = 38$, $ab = -1$
 then, the value of
 $ab^2 + ba^2$ or $ab(a + b)$
 $-1(6) = -6$
60. (d) $a^3 - b^3 = (a - b)[(a - b)^2 + 3ab]$
 $(2x - 5y)^3 - (2x + 5y)^3 = y(Ax^2 + By^2)$
 $(2x - 5y - 2x - 5y)[(-10y)^2 + 3 \times (2x - 5y) \times (2x + 5y)]$
 $= -10y[100y^2 + 3 \times ((2x)^2 - (5y)^2)]$
 $= -10y[100y^2 + 3 \times (4x^2 - 25y^2)]$
 $= -10y[100y^2 + 12x^2 - 75y^2]$
 $= -10y[25y^2 + 12x^2] = y(Ax^2 + By^2)$
 On comparing
 $A = -120$, $B = -250$
 $\Rightarrow 2A - B = -240 + 250 = 10$
61. (d) $\sqrt{x} + \frac{1}{\sqrt{x}} = 3$
 $x + \frac{1}{x} = 9 - 2 = 7$
 $x^2 + \frac{1}{x^2} = (7)^2 - 2 = 47$
 $\frac{x^4 + 1}{x^2} = 47$
 $x^4 + 1 = 47x^2$
 $x^4 - 47x^2 = -1$
 $= x^2(x^2 - 47) = -1$
62. (b) $4(x - 2)^2 + (y - 3)^2 - 2(x - 3)^2$
 For least possible value put
 $(y - 3)^2 = 0$
 $4(x - 2)^2 - 2(x - 3)^2$
 $= 4(x^2 + 4 - 4x) - 2(x^2 + 9 - 6x)$
 $= 4x^2 + 16 - 16x - 2x^2 - 18 + 12x$
 $= 2x^2 - 2 - 4x$
 $= 2(x^2 - 1 - 2x)$
 $= 2[(x - 1)^2 - 2]$
 We know,
 For least possible value put $(x - 1)^2 = 0$
 $= 2[(x - 1)^2 - 2] = 2 \times (-2) = -4$
63. (c) $x = 5.51$, $y = 5.52$, $z = 5.57$
 value of $x^3 + y^3 + z^3 - xyz$
 we know that
 $x^3 + y^3 + z^3 - 3xyz = \frac{x + y + z}{2} [(x - y)^2 + (y - z)^2 + (z - x)^2]$
 $= \frac{(5.51 + 5.52 + 5.57)}{2} [(5.51 - 5.52)^2 + (5.52 - 5.57)^2 + (5.57 - 5.51)^2]$
 $= \frac{16.60}{2} [(0.01)^2 + (0.05)^2 + (0.06)^2]$

- $= \frac{16.6}{2} [0.0001 + 0.0025 + 0.0036]$
 $= 8.3 [0.0062] = 0.05146$
64. (b) Given,
 $x^2 + xy + y^2 = \frac{3}{16} \dots (1)$
 As we know, $x^4 + y^4 + x^2y^2$
 $= (x^2 + y^2 + xy)(x^2 + y^2 - xy)$
 $\Rightarrow \left(\frac{21}{256}\right) = \left(\frac{3}{16}\right)(x^2 - xy + y^2)$
 $\Rightarrow (x^2 - xy + y^2) = \frac{7}{16} \dots (2)$
 On adding (1) and (2), We get-
 $\Rightarrow 2(x^2 + y^2) = \frac{5}{8}$
65. (c) $\Rightarrow \frac{8x}{2x^2 + 7x - 2} = 1$
 $\Rightarrow 8x = 2x^2 + 7x - 2$
 $\Rightarrow 2x^2 - x - 2 = 0$
 $\Rightarrow 2x - \frac{2}{x} = 1 \Rightarrow x - \frac{1}{x} = \frac{1}{2}$
 $x + \frac{1}{x} = \sqrt{\left(\frac{1}{2}\right)^2 + 4} = \frac{\sqrt{17}}{2}$
 We know,
 If $x + \frac{1}{x} = N$, then $x^3 + \frac{1}{x^3} = N^3 - 3N$
 $\Rightarrow x^3 + \frac{1}{x^3} = \frac{17\sqrt{17}}{8} - \frac{3\sqrt{17}}{2} = \frac{5\sqrt{17}}{8}$
66. (c) $a = 500$, $b = 502$, $c = 504$
 We know,
 $a^3 + b^3 + c^3 - 3abc = (a + b + c) \times 3d^2$
 $= (500 + 502 + 504) \times 3 \times (2)^2$
 $= 1506 \times 12 = 18072$
67. (b) We know,
 $(a - b)^2 = a^2 + b^2 - 2ab$
 $\Rightarrow 25 = 45 - 2ab$
 $\Rightarrow -20 = -2ab$
 $\Rightarrow ab = 10$
68. (b) $x^4 + \frac{1}{x^4} = 2599$
 $\Rightarrow x^2 + \frac{1}{x^2} = \sqrt{2599 + 2} = \sqrt{2601}$
 $x^2 + \frac{1}{x^2} = 51$
 $\Rightarrow x - \frac{1}{x} = \sqrt{51 - 2} = \sqrt{49} = 7$
69. (a) We know, $a^3 + b^3 + c^3 = (a + b + c) \{[a + b + c]^2 - 3(ab + bc + ca)\}$
 $= 9\{81 - 3 \times 18\} = 9(27) = 243$



SMART APPROACH:-

By value putting, $a = 3$, $b = 6$
 $\therefore a^3 + b^3 = 243$

70. (b)
 $x^2 - 4x + 1 = 0$
 $x + \frac{1}{x} = 4$
 $x^3 + \frac{1}{x^3} = (4)^3 - 3 \times 4 = 52$
 $x^6 + \frac{1}{x^6} = (52)^2 - 2 = 2702$
71. (d) As we know,
 If, $(a - b)^2 + (c - d)^2 = 0$
 $a = b$ and $c = d$
 $\left(x^3 + \frac{1}{x^3} - k\right)^2 + \left(x + \frac{1}{x} - p\right)^2 = 0$
 So, $\left(x^3 + \frac{1}{x^3} - k\right)^2 = 0 \Rightarrow x^3 + \frac{1}{x^3} = k$
 $\& \left(x + \frac{1}{x} - p\right)^2 = 0 \Rightarrow x + \frac{1}{x} = p$
 We know,
 $\left(x + \frac{1}{x}\right)^3 = x^3 + \frac{1}{x^3} + 3\left(x + \frac{1}{x}\right)$
 $\Rightarrow p^3 = k + 3p$
 $\Rightarrow k = p^3 - 3p$
 $\Rightarrow \frac{k}{p} = p^2 - 3$



SMART APPROACH:-

Put $x = 1$
 $\Rightarrow (2 - k)^2 + (2 - p)^2 = 0$
 $\Rightarrow k = 2$ and $p = 2$
 $\Rightarrow \frac{k}{p} = \frac{2}{2} = 1$
 Option $(P^2 - 3)$ (satisfied)

72. (d) $x^4 + x^2y^2 + y^4 = 133$
 $x^2 - xy + y^2 = 7 \dots (1)$
 We know,
 $(x^2 - xy + y^2)(x^2 + xy + y^2) = x^4 + x^2y^2 + y^4$
 $\Rightarrow 7(x^2 + xy + y^2) = 133$
 $\Rightarrow x^2 + xy + y^2 = 19 \dots (2)$
 Subtract eqn (1) from eqn (2)
 $\Rightarrow 2xy = 12 \Rightarrow xy = 6$
73. (c) We know that, $a^3 + b^3 + c^3 - 3abc = (a + b + c)[(a + b + c)^2 - 3(ab + bc + ca)]$
 $= 19(361 - 360) = 19$
74. (c) $x^3 - y^3 = (x - y)(x^2 + y^2 + xy)$
 $x^6 - 512y^6 = (x^2 - Ay^2)(x^4 + Bx^2y^2 + Cy^4)$
 $= [x^2 - (\sqrt{8y})^2][x^4 + 8x^2y^2 + 64y^4]$
 $= (x^2 + Ay^2)(x^4 - Bx^2y^2 + Cy^4)$
 On Comparing
 $A = -8$, $B = 8$ and $C = 64$
 Now,
 $A + B - C = (-8 - 8 - 64) = -80$
75. (d) $(a + b + c)(ab + bc + ca) - abc$
 put $a = b = c = 1$
 $(1 + 1 + 1)(1 + 1 + 1) - 1$
 $= 3 \times 3 - 1 = 8$
 Hence, Option 4
 $(a + b)(b + c)(c + a)$ (satisfied)



TRIGONOMETRY

18

प्रति शिफ्ट

1. Find the value of $(\tan^2\theta + \tan^4\theta)$.
($\tan^2\theta + \tan^4\theta$) किंवा सशक्तिकरण

SSC CPO 03/10/2023 (Shift-01)

- (a) $\sec^2\theta - \sec^4\theta$
(b) $\cot^2\theta - \tan^2\theta$
(c) $\sec^4\theta + \sec^2\theta$
(d) $\sec^4\theta - \sec^2\theta$

2. If θ is an angle and $\sin\theta + \operatorname{cosec}\theta = 2$, then the value of $\sin^5\theta + \operatorname{cosec}^5\theta$ is:

खर्या θ निका कसै प्रति वरस $\sin\theta + \operatorname{cosec}\theta = 2$ प्रति स $\sin^5\theta + \operatorname{cosec}^5\theta$ किंवा सशक्तिकरण

SSC CPO 03/10/2023 (Shift-01)

- (a) 2 (b) 10
(c) 4 (d) 5

3. If $\cos\theta - \sin\theta = \sqrt{2} \sin\theta$, then $(\cos\theta + \sin\theta)$ is:

खर्या $\cos\theta - \sin\theta = \sqrt{2} \sin\theta$ प्रति स $(\cos\theta + \sin\theta)$ किंवा सशक्तिकरण

SSC CPO 03/10/2023 (Shift-01)

- (a) $-\sqrt{2} \sin\theta$ (b) $\sqrt{2} \tan\theta$
(c) $\sqrt{2} \cos\theta$ (d) $-\sqrt{2} \cos\theta$

4. If $\tan A = \frac{4}{3}$, $0 \leq A \leq 90^\circ$, then find the value of $\sin A$.

खर्या $\tan A = \frac{4}{3}$, $0 \leq A \leq 90^\circ$ प्रति स $\sin A$ किंवा सशक्तिकरण

SSC CPO 03/10/2023 (Shift-01)

- (a) $\frac{3}{5}$ (b) $\frac{7}{5}$
(c) $\frac{4}{5}$ (d) $\frac{4}{7}$

5. The value of $(1 + \sin^4 A - \cos^4 A) \operatorname{cosec}^2 A$ is:

$(1 + \sin^4 A - \cos^4 A) \operatorname{cosec}^2 A$ किंवा सशक्तिकरण

SSC CPO 03/10/2023 (Shift-02)

- (a) -1 (b) 1
(c) -2 (d) 2

6. If $\cot\theta = \frac{4}{3}$, $0 < \theta < \frac{\pi}{2}$ and $5\operatorname{pcos}^2\theta \sin\theta = \cot^2\theta$, then the value of p is:

खर्या $\cot\theta = \frac{4}{3}$, $0 < \theta < \frac{\pi}{2}$ वरस $5\operatorname{pcos}^2\theta \sin\theta = \cot^2\theta$ किंवा सशक्तिकरण

SSC CPO 03/10/2023 (Shift-02)

- (a) $\frac{7}{27}$ (b) $\frac{5}{27}$
(c) $\frac{25}{27}$ (d) $\frac{125}{27}$

7. If $\cos A = \frac{15}{17}$, $0 \leq A \leq 90^\circ$, then the value of $\cot(90^\circ - A)$ is:

खर्या $\cos A = \frac{15}{17}$, $0 \leq A \leq 90^\circ$ प्रति स $\cot(90^\circ - A)$ किंवा सशक्तिकरण

SSC CPO 03/10/2023 (Shift-02)

- (a) $\frac{8}{15}$ (b) $\frac{7}{15}$
(c) $\frac{\sqrt{2}}{15}$ (d) $\frac{2\sqrt{2}}{15}$

8. Find the value of $\frac{\cos 65^\circ}{\sin 25^\circ} + \frac{5 \sin 19^\circ}{\cos 71^\circ} - \frac{3 \cos 28^\circ}{\sin 62^\circ}$.

SSC CPO 03/10/2023 (Shift-02)

- (a) 3 (b) 2
(c) 1 (d) 0

9. If $\sin\theta + \cos\theta = \frac{\sqrt{11}}{3}$, then the value of $(\cos\theta - \sin\theta)$ is:

खर्या $\sin\theta + \cos\theta = \frac{\sqrt{11}}{3}$ प्रति स $(\cos\theta - \sin\theta)$ किंवा सशक्तिकरण

SSC CPO 03/10/2023 (Shift-03)

- (a) $\frac{\sqrt{5}}{3}$ (b) $\frac{7}{3}$
(c) $\frac{5}{3}$ (d) $\frac{\sqrt{7}}{3}$

10. If $A + B = 90^\circ$, then the expression $\frac{\cot A}{\cot B} + \cos^2 A + \cos^2 B$ is equal to:

खर्या $A + B = 90^\circ$ प्रति स वरस $\frac{\cot A}{\cot B} + \cos^2 A + \cos^2 B$ किंवा सशक्तिकरण

SSC CPO 03/10/2023 (Shift-3)

- (a) $\cot^2 B$ (b) $\operatorname{cosec}^2 A$
(c) $\operatorname{cosec}^2 B$ (d) $\cot^2 A$

11. If $\tan A = \frac{2}{5}$ find the value of $\frac{\sec^2 A}{\operatorname{cosec}^2 A}$.

खर्या $\tan A = \frac{2}{5}$ प्रति स $\frac{\sec^2 A}{\operatorname{cosec}^2 A}$ किंवा सशक्तिकरण

SSC CPO 03/10/2023 (Shift-03)

- (a) $\frac{3}{5}$ (b) $\frac{4}{25}$
(c) $\frac{2}{5}$ (d) $\frac{9}{25}$

12. If $k(\tan 45^\circ \sin 60^\circ) = \cos 60^\circ \cot 30^\circ$, then the value of k is:

खर्या $k(\tan 45^\circ \sin 60^\circ) = \cos 60^\circ \cot 30^\circ$ प्रति स k किंवा सशक्तिकरण

SSC CPO 04/10/2023 (Shift-01)

- (a) 1 (b) $\frac{1}{\sqrt{3}}$
(c) $\sqrt{3}$ (d) 3

13. Find the value of $\frac{\cos 37^\circ}{\sin 53^\circ} - \cos 47^\circ \operatorname{cosec} 43^\circ$.

$\frac{\cos 37^\circ}{\sin 53^\circ} - \cos 47^\circ \operatorname{cosec} 43^\circ$ किंवा सशक्तिकरण

SSC CPO 04/10/2023 (Shift-01)

- (a) -1 (b) 1
(c) 2 (d) 0

14. In $\triangle ABC$, $\angle B = 90^\circ$ and $AB : BC = 1 : 2$. The value of $\cos A + \tan C$ is:
 $\triangle ABC$ में $\angle B = 90^\circ$ वरु $AB : BC = 1 : 2$ प्र $\cos A + \tan C$ कसी स _____ प्र

SSC CPO 04/10/2023 (Shift-01)

- (a) $\frac{1+\sqrt{5}}{2\sqrt{5}}$ (b) $\frac{2\sqrt{5}}{2+\sqrt{5}}$
 (c) $\frac{5+\sqrt{5}}{2\sqrt{5}}$ (d) $\frac{2+\sqrt{5}}{2\sqrt{5}}$

15. If $\sin A + \sin^2 A = 1$, then the value of $\cos^4 A + \cos^6 A$ is:

खर $\sin A + \sin^2 A = 1$ प्रती स $\cos^4 A + \cos^6 A$ कसी स $\cos^4 A$ कसी स $\cos^6 A$ कसी स $\cos^4 A$

SSC CPO 04/10/2023 (Shift-01)

- (a) 1 (b) $\cos A$
 (c) $\sin A$ (d) 0

16. If $\sec A - \tan A = p$, then find the value of $\sec A$.

खर $\sec A - \tan A = p$, प्रती स $\sec A$ कसी स $\sec A$ कसी स $\sec A$ कसी स $\sec A$

SSC CPO 04/10/2023 (Shift-02)

- (a) $\frac{p^2 - 1}{p^2 + 1}$ (b) $\frac{p^2 + 1}{p^2 - 1}$
 (c) $\frac{p^2 + 1}{2p}$ (d) $\frac{p^2 + 1}{p}$

17. $2(\sin 1^\circ \times \sec 89^\circ) + 3(\cos 11^\circ \times \operatorname{cosec} 79^\circ) + 5(\tan 21^\circ \times \tan 69^\circ) = ?$

SSC CPO 04/10/2023 (Shift-02)

- (a) 20 (b) 12
 (c) 11 (d) 10

18. Find the value of $\sqrt{\frac{1 - \tan A}{1 + \tan A}}$

$\sqrt{\frac{1 - \tan A}{1 + \tan A}}$ कसी स $\sqrt{\frac{1 - \tan A}{1 + \tan A}}$ कसी स $\sqrt{\frac{1 - \tan A}{1 + \tan A}}$ कसी स $\sqrt{\frac{1 - \tan A}{1 + \tan A}}$

SSC CPO 04/10/2023 (Shift-02)

- (a) $\sqrt{\frac{1 + \sin A}{\cos A}}$
 (b) $\sqrt{\frac{1 + \sin 2A}{\cos 2A}}$
 (c) $\sqrt{\frac{1 - \sin A}{\cos A}}$
 (d) $\sqrt{\frac{1 - \sin 2A}{\cos 2A}}$

19. If $7 \sin^2 A + 3 \cos^2 A = 4$, then find $\cot A$:

खर $7 \sin^2 A + 3 \cos^2 A = 4$ प्रती स $\cot A$ कसी स $\cot A$ कसी स $\cot A$ कसी स $\cot A$

SSC CPO 04/10/2023 (Shift-02)

- (a) $\frac{1}{\sqrt{3}}$ (b) $\frac{1}{\sqrt{2}}$
 (c) $\sqrt{3}$ (d) $\sqrt{2}$

20. Find the least value of $16 \operatorname{cosec}^2 \theta + 25 \sin^2 \theta$.

$16 \operatorname{cosec}^2 \theta + 25 \sin^2 \theta$ कसी स $16 \operatorname{cosec}^2 \theta + 25 \sin^2 \theta$ कसी स $16 \operatorname{cosec}^2 \theta + 25 \sin^2 \theta$ कसी स $16 \operatorname{cosec}^2 \theta + 25 \sin^2 \theta$

SSC CPO 04/10/2023 (Shift-3)

- (a) 35 (b) 38
 (c) 42 (d) 40

21. If $\operatorname{cosec} A + \cot A = 3$, $0 \leq A \leq 90^\circ$, then find the value of $\cos A$.

खर $\operatorname{cosec} A + \cot A = 3$, $0 \leq A \leq 90^\circ$, प्रती स $\cos A$ कसी स $\cos A$ कसी स $\cos A$ कसी स $\cos A$

SSC CPO 04/10/2023 (Shift-3)

- (a) $\frac{2}{5}$ (b) $\frac{3}{4}$
 (c) $\frac{3}{5}$ (d) $\frac{4}{5}$

22. If $\cos A = \frac{1}{11}$, then find the value of $\cot A$.

खर $\cos A = \frac{1}{11}$ प्रती स $\cot A$ कसी स $\cot A$ कसी स $\cot A$ कसी स $\cot A$

SSC CPO 04/10/2023 (Shift-3)

- (a) $\frac{2\sqrt{30}}{11}$ (b) $2\sqrt{30}$
 (c) $\frac{11}{2\sqrt{30}}$ (d) $\frac{1}{2\sqrt{30}}$

23. If $\cos A = \frac{1}{2}$, $0 \leq A \leq 90^\circ$, then what is the value of $\sin(180^\circ - A)$?

खर $\cos A = \frac{1}{2}$, $0 \leq A \leq 90^\circ$ प्रती स $\sin(180^\circ - A)$ कसी स $\sin(180^\circ - A)$ कसी स $\sin(180^\circ - A)$ कसी स $\sin(180^\circ - A)$

SSC CPO 05/10/2023 (Shift-01)

- (a) $\frac{1}{\sqrt{3}}$ (b) $\frac{\sqrt{3}}{2}$
 (c) 3 (d) $\frac{1}{2}$

24. If $\sin A = \frac{2}{3}$, then find the value of $(7 - \tan A)(3 + \cos A)$.

खर $\sin A = \frac{2}{3}$, प्रती स $(7 - \tan A)(3 + \cos A)$ कसी स $(7 - \tan A)(3 + \cos A)$ कसी स $(7 - \tan A)(3 + \cos A)$ कसी स $(7 - \tan A)(3 + \cos A)$

SSC CPO 05/10/2023 (Shift-01)

- (a) $\frac{61}{3} + \frac{17}{\sqrt{5}}$ (b) $\frac{61}{3} - \frac{17}{3\sqrt{5}}$
 (c) $\frac{61}{3} + \frac{17}{3\sqrt{5}}$ (d) $\frac{61}{3\sqrt{5}} + \frac{17}{3}$

25. If $\sin \beta = \frac{1}{3}$, $(\sec \beta - \tan \beta)^2$ is equal to:

खर $\sin \beta = \frac{1}{3}$ प्रती स $(\sec \beta - \tan \beta)^2$ कसी स $(\sec \beta - \tan \beta)^2$ कसी स $(\sec \beta - \tan \beta)^2$ कसी स $(\sec \beta - \tan \beta)^2$

SSC CPO 05/10/2023 (Shift-01)

- (a) $\frac{1}{3}$ (b) $\frac{1}{2}$
 (c) $\frac{2}{3}$ (d) $\frac{3}{4}$

26. Find the value of $\frac{\sin^2 39^\circ + \sin^2(90^\circ - 39^\circ)}{\cos^2 35^\circ + \cos^2(90^\circ - 35^\circ)} + 3 \tan 15^\circ \tan 75^\circ$:

$\frac{\sin^2 39^\circ + \sin^2(90^\circ - 39^\circ)}{\cos^2 35^\circ + \cos^2(90^\circ - 35^\circ)} + 3 \tan 15^\circ \tan 75^\circ$

$+ 3 \tan 15^\circ \tan 75^\circ$

SSC CPO 05/10/2023 (Shift-2)

- (a) 1 (b) 3
 (c) 4 (d) 2

27. If $\tan \theta + \cot \theta = 2$, θ is an acute angle, then find the value of $2 \tan^{25} \theta + 3 \cot^{20} \theta + 5 \tan^{30} \theta \cot^{15} \theta$.

खर $\tan \theta + \cot \theta = 2$, θ नक θ कसी स $2 \tan^{25} \theta + 3 \cot^{20} \theta + 5 \tan^{30} \theta \cot^{15} \theta$ कसी स $2 \tan^{25} \theta + 3 \cot^{20} \theta + 5 \tan^{30} \theta \cot^{15} \theta$ कसी स $2 \tan^{25} \theta + 3 \cot^{20} \theta + 5 \tan^{30} \theta \cot^{15} \theta$

SSC CPO 05/10/2023 (Shift-02)

- (a) 12 (b) 10
 (c) 8 (d) 6

28. Find the value of $\sin(50^\circ + A) - \cos(40^\circ - A)$.

$\sin(50^\circ + A) - \cos(40^\circ - A)$ कसी स $\sin(50^\circ + A) - \cos(40^\circ - A)$ कसी स $\sin(50^\circ + A) - \cos(40^\circ - A)$ कसी स $\sin(50^\circ + A) - \cos(40^\circ - A)$

SSC CPO 05/10/2023 (Shift-02)

- (a) 1 (b) 0
 (c) -1 (d) 2

29. If $\sin\theta + \cos\theta = \frac{\sqrt{11}}{3}$, then what is $\sin\theta - \cos\theta$?

खरय $\sin\theta + \cos\theta = \frac{\sqrt{11}}{3}$, तब $\sin\theta - \cos\theta$ की कौन सी संभावित मान है?

SSC CPO 05/10/2023 (Shift-02)

- (a) $\frac{\sqrt{5}}{3}$ (b) $\frac{\sqrt{7}}{3}$
(c) $\frac{\sqrt{7}}{4}$ (d) $\frac{\sqrt{5}}{2}$

30. If $\sin\theta + \cos\theta = \sqrt{2} \cos\theta$ then find $\frac{\sin\theta - \cos\theta}{\sin\theta}$:

खरय $\sin\theta + \cos\theta = \sqrt{2} \cos\theta$ तब $\frac{\sin\theta - \cos\theta}{\sin\theta}$ का मान क्या है?

SSC CPO 05/10/2023 (Shift-03)

- (a) $-\sqrt{2}$ (b) -1
(c) 1 (d) $\sqrt{2}$

31. If $\frac{2 \sin A - \cos A}{\sin A + \cos A} = 1$, then find the value of $\cot A$.

खरय $\frac{2 \sin A - \cos A}{\sin A + \cos A} = 1$ तब $\cot A$ का मान क्या है?

SSC CPO 05/10/2023 (Shift-03)

- (a) 1 (b) 2
(c) $\frac{1}{2}$ (d) $\frac{1}{3}$

32. The value of $2\tan^2 45^\circ + \cos^2 30^\circ - \sin^2 60^\circ$ is:

$2\tan^2 45^\circ + \cos^2 30^\circ - \sin^2 60^\circ$ का मान क्या है?

SSC CPO 05/10/2023 (Shift-03)

- (a) -2 (b) 2
(c) 1 (d) -1

33. If $\cot^2\theta = 1 - e^2$, then the value of $\operatorname{cosec}\theta + \cot^3\theta \sec\theta$ is:

खरय $\cot^2\theta = 1 - e^2$, तब $\operatorname{cosec}\theta + \cot^3\theta \sec\theta$ का मान क्या है?

SSC CPO 05/10/2023 (Shift-03)

- (a) $(2 - e^2)^{\frac{3}{2}}$ (b) $(1 - e^2)$
(c) $(1 - e^2)^{\frac{3}{2}}$ (d) $(2 - e^2)^{\frac{1}{2}}$

34. If $x = \frac{2 \sin\theta}{(1 + \cos\theta + \sin\theta)}$, then the value of $\frac{1 - \cos\theta + \sin\theta}{(1 + \sin\theta)}$ is:

खरय $x = \frac{2 \sin\theta}{(1 + \cos\theta + \sin\theta)}$ तब $\frac{1 - \cos\theta + \sin\theta}{(1 + \sin\theta)}$ का मान क्या है?

$\frac{1 - \cos\theta + \sin\theta}{(1 + \sin\theta)}$ का मान क्या है?

SSC CPO 09/11/2022 (Shift-01)

- (a) $\frac{x}{(1+x)}$ (b) x
(c) $\frac{1}{x}$ (d) $\frac{(1+x)}{x}$

35. If $\left\{ \frac{\sec\theta - 1}{\sec\theta + 1} \right\}^n = \operatorname{cosec}\theta - \cot\theta$ then $n = ?$:

खरय $\left\{ \frac{\sec\theta - 1}{\sec\theta + 1} \right\}^n = \operatorname{cosec}\theta - \cot\theta$ तब $n = ?$

SSC CPO 09/11/2022 (Shift-01)

- (a) 1 (b) 0.5
(c) -1 (d) -0.5

36. $16\sec^2 A - 16\tan^2 A = \underline{\hspace{2cm}}$.

SSC CPO 09/11/2022 (Shift-01)

- (a) 9 (b) 0
(c) 16 (d) 1

37. The value of $\frac{1 + \tan\theta}{1 - \tan\theta} + \frac{1 - \tan\theta}{1 + \tan\theta}$ is:

$(2\cos^2\theta - 1) \left[\frac{1 + \tan\theta}{1 - \tan\theta} + \frac{1 - \tan\theta}{1 + \tan\theta} \right]$ का मान क्या है?

SSC CPO 09/11/2022 (Shift-01)

- (a) 2 (b) 0
(c) $\frac{\sqrt{3}}{2}$ (d) 1

38. In a right triangle for an acute angle x , find $\sin x$. It is given that $\tan x = 5$.

खरय $\tan x = 5$ एक समकोण त्रिभुज में तब $\sin x$ का मान क्या है?

SSC CPO 09/11/2022 (Shift-02)

- (a) $\frac{1}{3}$ (b) $\frac{5}{\sqrt{26}}$
(c) $\frac{2}{5}$ (d) $\frac{5}{\sqrt{28}}$

39. Simplify $\frac{\sin 8\theta \cos \theta - \sin 6\theta \cos 3\theta}{\cos 2\theta \cos \theta - \sin 3\theta \sin 4\theta}$

$\frac{\sin 8\theta \cos \theta - \sin 6\theta \cos 3\theta}{\cos 2\theta \cos \theta - \sin 3\theta \sin 4\theta}$

SSC CPO 09/11/2022 (Shift-02)

- (a) $\cot\theta$ (b) $\cot 2\theta$
(c) $\tan\theta$ (d) $\tan 2\theta$

40. The value of $(\sin^4 45^\circ + \cos^4 60^\circ) + (\tan^4 45^\circ + \cot^4 45^\circ)$ is:

SSC CPO 09/11/2022 (Shift-02)

- (a) $\frac{37}{16}$ (b) $\frac{33}{16}$
(c) $\frac{35}{16}$ (d) $\frac{39}{16}$

41. The value of $(1 + \cot A - \operatorname{cosec} A)(1 + \tan A + \sec A) - 1$ is:

SSC CPO 09/11/2022 (Shift-02)

- (a) 1 (b) 2
(c) 3 (d) 0

42. The value of $23\operatorname{cosec}^2 A - 23\cot^2 A$ is:

SSC CPO 09/11/2022 (Shift-03)

- (a) 23 (b) 1
(c) 27 (d) 0

43. Given that A and B are second quadrant angles, $\sin A = \frac{1}{3}$ and

$\sin B = \frac{1}{5}$, then find the value

of $\cos(A - B)$.

यदि A और B द्वितीय चतुर्थांश के कोण हों, $\sin A = \frac{1}{3}$ और $\sin B = \frac{1}{5}$ हो, तो $\cos(A - B)$ का मान क्या है?

कौन सा मान $\sin A = \frac{1}{3}$ और $\sin B = \frac{1}{5}$ के लिए $\cos(A - B)$ का मान है?

$\frac{1}{5}$ तब $\cos(A - B)$ का मान क्या है?

SSC CPO 09/11/2022 (Shift-03)

- (a) $\frac{4\sqrt{3} + 1}{15}$ (b) $\frac{8\sqrt{3} - 1}{15}$
(c) $\frac{8\sqrt{3} + 1}{15}$ (d) $\frac{4\sqrt{3} - 1}{15}$

44. What is the value of $\frac{\sin(A+B)}{\sin A \cos B}$?

SSC CPO 09/11/2022 (Shift-03)

- (a) $1 + \cot A \tan B$
(b) $1 + \tan A \cot B$
(c) $1 - \sin A \cos B$
(d) $1 - \cot A \tan B$

45. Which of the following is the value of/ कसी सरि ढरू र?सि ईलैकसलिप्रद

$$\sqrt{\frac{1 - \sin 45^\circ}{1 + \sin 45^\circ}}?$$

SSC CPO 09/11/2022 (Shift-03)

- (a) $\cos 45^\circ - \tan 45^\circ$
(b) $\tan 45^\circ - \sec 45^\circ$
(c) $\tan 45^\circ$
(d) $\sec 45^\circ - \tan 45^\circ$

46. The value of the expression $\cos^2 45^\circ + \cos^2 135^\circ + \cos^2 225^\circ + \cos^2 315^\circ$ is:

$$\text{ढरूज क } \cos^2 45^\circ + \cos^2 135^\circ + \cos^2 225^\circ + \cos^2 315^\circ \text{ कसी सिप्रे}$$

SSC CPO 10/11/2022 (Shift-01)

- (a) 2 (b) $\frac{1}{2}$
(c) $\frac{3}{2}$ (d) 1

47. The value of/कसी सिप्रे खसिप्रद

$$\frac{2\cos^3 \theta - \cos \theta}{\sin \theta - 2\sin^3 \theta} \text{ is:}$$

SSC CPO 10/11/2022 (Shift-01)

- (a) $\sec \theta$ (b) $\sin \theta$
(c) $\cot \theta$ (d) $\tan \theta$

48. If $\cos 48^\circ = \frac{m}{n}$

Then, $\sec 48^\circ - \cot 42^\circ$ is equal to:

$$\text{खसि } \cos 48^\circ = \frac{m}{n} \text{ प्रती सि } \sec 48^\circ - \cot 42^\circ \text{ कैलि पूसूर प्र}$$

SSC CPO 10/11/2022 (Shift-01)

- (a) $\frac{m - \sqrt{n^2 - m^2}}{m}$
(b) $\frac{m - \sqrt{n^2 - m^2}}{n}$
(c) $\frac{n - \sqrt{n^2 - m^2}}{n}$
(d) $\frac{n - \sqrt{n^2 - m^2}}{m}$

49. Solve the following equation.

र ढरू र?सिली ढरूज कसिपू किहजन

$$\sec^2 \theta (\sqrt{1 - \sin^2 \theta})$$

SSC CPO 10/11/2022 (Shift-01)

- (a) $\tan \theta$ (b) $\operatorname{cosec} \theta$

- (c) $\sec \theta$ (d) 1

50. If $\cos A + \cos B + \cos C = 3$. Then what is the value of $\sin A + \sin B + \sin C$?

$$\text{खसि } \cos A + \cos B + \cos C = 3 \text{ सि } \sin A + \sin B + \sin C \text{ कसी सिप्रे खसिप्रद}$$

SSC CPO 10/11/2022 (Shift-02)

- (a) 1 (b) 2
(c) 0 (d) -1

51. What is the value of following in the term of trigonometric ratios?

$$\frac{\sin A}{1 + \cos A} + \frac{1 + \cos A}{\sin A}$$

SSC CPO 10/11/2022 (Shift-02)

- (a) $2 \operatorname{cosec} A$ (b) $2 \cos A$
(c) $2 \sec A$ (d) $2 \sin A$

52. If the value of $\operatorname{cosec} A + \cot A = m$, then the value of $\operatorname{cosec} A - \cot A$ is:

$$\text{खसि } \operatorname{cosec} A + \cot A = m \text{ प्रती सि } \operatorname{cosec} A - \cot A \text{ कसी सिप्रे खसिप्रद}$$

SSC CPO 10/11/2022 (Shift-02)

- (a) $\frac{1}{m}$ (b) m
(c) $\sqrt{m}$ (d) m^2

53. If $\cos \theta + \sin \theta = \sqrt{2} \cos \theta$, find the value of $(\cos \theta - \sin \theta)$

$$\text{खसि } \cos \theta + \sin \theta = \sqrt{2} \cos \theta \text{ प्रती सि } (\cos \theta - \sin \theta) \text{ कसी सिप्रे खसिप्रद}$$

SSC CPO 10/11/2022 (Shift-02)

- (a) $\sqrt{2} \sin \theta$ (b) $\sqrt{2} \cos \theta$
(c) $\frac{1}{\sqrt{2}} \sin \theta$ (d) $\frac{1}{2} \cos \theta$

54. Simplify the following: $(1 + \cot^2 \theta)(1 - \cos \theta)(1 + \cos \theta)$

SSC CPO 10/11/2022 (Shift-03)

- (a) 1 (b) -5
(c) 3 (d) -3

55. If $\cos \theta + \sec \theta = 2$, then the value of $\sin^6 \theta + \cos^6 \theta$ is:

$$\text{खसि } \cos \theta + \sec \theta = 2 \text{ प्रती सि } \sin^6 \theta + \cos^6 \theta \text{ कसी सिप्रे खसिप्रद}$$

SSC CPO 10/11/2022 (Shift-03)

- (a) $\frac{1}{3}$ (b) 0
(c) 1 (d) $\frac{1}{2}$

56. Find/खसिप्रद $\cos\left(-\frac{7\pi}{2}\right)$.

SSC CPO 10/11/2022 (Shift-03)

- (a) $\frac{1}{2}$ (b) 1
(c) -1 (d) 0

57. The value of/कसी सिप्रे खसिप्रद $(\operatorname{cosec} A + \cot A)(1 - \cos A)$ is:

SSC CPO 10/11/2022 (Shift-03)

- (a) $\cos A$ (b) $\tan A$
(c) $\cot A$ (d) $\sin A$

58. If $\cos A = \sin^2 A$, and $a \sin^{12} A + b \sin^{10} A + c \sin^8 A + \sin^6 A = 1$, then $a + b + c = ?$

$$\text{खसि } \cos A = \sin^2 A \text{ व सि } a \sin^{12} A + b \sin^{10} A + c \sin^8 A + \sin^6 A = 1 \text{ सि } a + b + c = ?$$

SSC CPO 11/11/2022 (Shift-01)

- (a) 7 (b) 8
(c) 9 (d) 6

59. Simplify/र ढरूज कसी सिप्रे खसिप्रद $\cos(36^\circ - A) \cos(36^\circ + A) + \cos(54^\circ - A) \cos(54^\circ + A)$

SSC CPO 11/11/2022 (Shift-01)

- (a) $\cos A$ (b) $\sin 2A$
(c) $\cos 2A$ (d) $\sin A$

60. Evaluate/कसी सरि कसू न

$$\frac{\sin 54^\circ}{\cos 36^\circ} + \frac{\sec 46^\circ}{\operatorname{cosec} 44^\circ}$$

SSC CPO 11/11/2022 (Shift-01)

- (a) 0 (b) -1
(c) 2 (d) 1

61. If $4 \cos \theta + 3 \sin \theta = x$ and $4 \sin \theta - 3 \cos \theta = y$, find the value of $x^2 + y^2$.

$$\text{खसि } 4 \cos \theta + 3 \sin \theta = x \text{ व सि } 4 \sin \theta - 3 \cos \theta = y \text{ कसी सिप्रे खसिप्रद } x^2 + y^2$$

SSC CPO 11/11/2022 (Shift-01)

- (a) 16 (b) 9
(c) 25 (d) 1

62. Simplify/र ढरूज कसी सिप्रे खसिप्रद

$$\frac{\cos^4 \theta - \sin^4 \theta}{\sin^2 \theta}$$

SSC CPO 11/11/2022 (Shift-02)

- (a) $1 - \tan^2 \theta$ (b) $\tan^2 \theta - 1$
(c) $\cot^2 \theta - 1$ (d) $1 - \cot^2 \theta$

63. The value of $\frac{\sin A}{\cot A + \operatorname{cosec} A} - \frac{\sin A}{\cot A - \operatorname{cosec} A} - 1$

$$\frac{\sin A}{\cot A + \operatorname{cosec} A} - \frac{\sin A}{\cot A - \operatorname{cosec} A} - 1$$

SSC CPO 11/11/2022 (Shift-02)

- (a) $\frac{1}{2}$ (b) 1
(c) 0 (d) 2

64. If $\sin^2 \theta = \cos^3 \theta$, then the value of $\cot^2 \theta - \cot^6 \theta$ is:

खर्या $\sin^2 \theta = \cos^3 \theta$ फि प्रती $\cot^2 \theta - \cot^6 \theta$ किस्सी सर्फि खर्या प्रद

SSC CPO 11/11/2022 (Shift-02)

- (a) -1 (b) 0
(c) 2 (d) 1

65. If $\sin A = \frac{1}{2}$, then the value of $(\tan A + \cos A)$ is:

खर्या $\sin A = \frac{1}{2}$ फि प्रती $(\tan A + \cos A)$ कस्सी सर्फि खर्या प्रद

SSC CPO 11/11/2022 (Shift-02)

- (a) $\frac{2}{3\sqrt{3}}$ (b) $\frac{3}{2\sqrt{3}}$
(c) $\frac{5}{2\sqrt{3}}$ (d) $\frac{5}{3\sqrt{3}}$

66. If $1 + \sin^2 \theta - 3 \sin \theta \cos \theta = 0$, then the value of $\cot \theta$ is:

खर्या $1 + \sin^2 \theta - 3 \sin \theta \cos \theta = 0$, फि $\cot \theta$ कस्सी सर्फि खर्या प्रद

SSC CPO 11/11/2022 (Shift-03)

- (a) 0 (b) 2
(c) $\frac{1}{2}$ (d) $\frac{1}{3}$

67. If $\cos^4 \alpha - \sin^4 \alpha = \frac{5}{6}$, then the value of $2 \cos^2 \alpha - 1$ is:

खर्या $\cos^4 \alpha - \sin^4 \alpha = \frac{5}{6}$ फि

$2 \cos^2 \alpha - 1$ फि सर्फि खर्या प्रद

SSC CPO 11/11/2022 (Shift-03)

- (a) $\frac{11}{6}$ (b) $\frac{5}{6}$
(c) $\frac{6}{11}$ (d) $\frac{6}{5}$

68. If $\tan 45^\circ + \sec 60^\circ = x$, find the value of x .

खर्या $\tan 45^\circ + \sec 60^\circ = x$ फि x किस्सी सर्फि खर्या प्रद

SSC CPO 11/11/2022 (Shift-03)

- (a) 1 (b) 4
(c) 3 (d) 2

69. If $4(\operatorname{cosec}^2 57^\circ - \tan^2 33^\circ) - \cos 90^\circ - y \tan^2 66^\circ \tan^2 24^\circ = \frac{y}{2}$ then value of y is:

खर्या $4(\operatorname{cosec}^2 57^\circ - \tan^2 33^\circ) - \cos$

$90^\circ - y \tan^2 66^\circ \tan^2 24^\circ = \frac{y}{2}$ फि प्रती y किस्सी सर्फि खर्या प्रद

SSC CPO 23/11/2020 (Shift-1)

- (a) -4 (b) 8
(c) 4 (d) $\frac{8}{3}$

70. If $4 - 2 \sin^2 \theta - 5 \cos \theta = 0$, $0^\circ < \theta < 90^\circ$, then the value of $\cos \theta + \tan \theta$ is:

खर्या $4 - 2 \sin^2 \theta - 5 \cos \theta = 0$, $0^\circ < \theta < 90^\circ$ फि प्रती $\cos \theta + \tan \theta$ कस्सी सर्फि खर्या प्रद

SSC CPO 23/11/2020 (Shift-1)

- (a) $\frac{2 + \sqrt{3}}{2}$ (b) $\frac{2 - \sqrt{3}}{2}$
(c) $\frac{1 + 2\sqrt{3}}{2}$ (d) $\frac{1 - 2\sqrt{3}}{2}$

71. If $\sec 3x = \operatorname{cosec} (3x - 45^\circ)$, where $3x$ is an acute angle, then x is equal to:

खर्या $\sec 3x = \operatorname{cosec} (3x - 45^\circ)$ फि प्रती $3x$ ज़िम्मा किस्सी प्रती सर्फि x किस्सी सर्फि खर्या प्रद

SSC CPO 23/11/2020 (Shift-2)

- (a) 27.5° (b) 45°
(c) 35° (d) 22.5°

72. The value of $\frac{\sin^2 30^\circ + \cos^2 60^\circ - \sec 35^\circ \cdot \sin 55^\circ}{\sec 60^\circ + \operatorname{cosec} 30^\circ}$

$$\frac{\sin^2 30^\circ + \cos^2 60^\circ - \sec 35^\circ \cdot \sin 55^\circ}{\sec 60^\circ + \operatorname{cosec} 30^\circ}$$

SSC CPO 23/11/2020 (Shift-2)

- (a) $-\frac{1}{4}$ (b) $\frac{1}{4}$
(c) $-\frac{1}{8}$ (d) $\frac{1}{8}$

73. If $\sin 3x = \cos (3x - 45^\circ)$, $0^\circ < 3x < 90^\circ$, then x is equal to:

खर्या $\sin 3x = \cos (3x - 45^\circ)$, $0^\circ < 3x < 90^\circ$ फि प्रती x किस्सी सर्फि खर्या प्रद

SSC CPO 24/11/2020 (Shift-1)

- (a) 35° (b) 45°
(c) 22.5° (d) 27.5°

74. The value of $\frac{\sin^2 30^\circ + \cos^2 60^\circ + \sec 45^\circ \cdot \sin 45^\circ}{\sec 60^\circ + \operatorname{cosec} 30^\circ}$

$$\frac{\sin^2 30^\circ + \cos^2 60^\circ + \sec 45^\circ \cdot \sin 45^\circ}{\sec 60^\circ + \operatorname{cosec} 30^\circ}$$

SSC CPO 24/11/2020 (Shift-1)

- (a) $-\frac{1}{4}$ (b) $\frac{3}{8}$
(c) $-\frac{3}{8}$ (d) $\frac{1}{4}$

75. The value of $\frac{\sin^2 52^\circ + 2 + \sin^2 38^\circ}{4 \cos^2 43^\circ - 5 + 4 \cos^2 47^\circ}$ is:

$$\frac{\sin^2 52^\circ + 2 + \sin^2 38^\circ}{4 \cos^2 43^\circ - 5 + 4 \cos^2 47^\circ} \text{ is:}$$

SSC CPO 24/11/2020 (Shift-2)

- (a) 3 (b) $\frac{1}{3}$
(c) $-\frac{1}{3}$ (d) -3

76. If 4θ is an acute angle, and $\cot 4\theta = \tan (\theta - 5^\circ)$, then what is the value of θ ?

खर्या 4θ ज़िम्मा किस्सी प्रती $\cot 4\theta = \tan (\theta - 5^\circ)$ फि प्रती θ किस्सी सर्फि खर्या प्रद

SSC CPO 24/11/2020 (Shift-2)

- (a) 19° (b) 45°
(c) 21° (d) 24°

77. Solve for θ : $\cos^2 \theta - \sin^2 \theta = \frac{1}{2}$, $0^\circ < \theta < 90^\circ$.

θ किस्सी सर्फि खर्या प्रद $\cos^2 \theta - \sin^2 \theta = \frac{1}{2}$

θ किस्सी सर्फि खर्या प्रद $0^\circ < \theta < 90^\circ$

SSC CPO 25/11/2020 (Shift-2)

- (a) 45° (b) 60°
(c) 40° (d) 30°

78. If $\cot \theta = \frac{1}{\sqrt{3}}$, $0^\circ < \theta < 90^\circ$, then the value of $\frac{2 - \sin^2 \theta}{1 - \cos^2 \theta} + (\operatorname{cosec}^2 \theta - \sec \theta)$ is:

$$\frac{2 - \sin^2 \theta}{1 - \cos^2 \theta} + (\operatorname{cosec}^2 \theta - \sec \theta)$$

θ किस्सी सर्फि खर्या प्रद

खर्या $\cot \theta = \frac{1}{\sqrt{3}}$, $0^\circ < \theta < 90^\circ$ फि प्रती $\frac{2 - \sin^2 \theta}{1 - \cos^2 \theta} + (\operatorname{cosec}^2 \theta - \sec \theta)$ किस्सी सर्फि खर्या प्रद

$$\frac{2 - \sin^2 \theta}{1 - \cos^2 \theta} + (\operatorname{cosec}^2 \theta - \sec \theta)$$

θ किस्सी सर्फि खर्या प्रद

SSC CPO 25/11/2020 (Shift-2)

- (a) 5 (b) 0
(c) 1 (d) 2

79. If $0^\circ \leq \theta \leq 90^\circ$, $\sec^{107} \theta + \cos^{107} \theta = 2$, then, $(\sec \theta + \cos \theta)$ is equal to:
 खर्या $0^\circ \leq \theta \leq 90^\circ$, $\sec^{107} \theta + \cos^{107} \theta = 2$, प्रती सै $(\sec \theta + \cos \theta)$ कसी सशस कइजन

SSC CPO 09/12/2019 (Shift-01)

- (a) 2 (b) 1
 (c) $\frac{1}{2}$ (d) 2^{-107}

80. If $0^\circ \leq \theta \leq 90^\circ$, $\sin(2\theta + 50^\circ) = \cos(4\theta + 16^\circ)$, then what is the value of θ (in degrees)?
 खर्या $0^\circ \leq \theta \leq 90^\circ$, $\sin(2\theta + 50^\circ) = \cos(4\theta + 16^\circ)$, प्रती सै कसी सशस कइजन

SSC CPO 09/12/2019 (Shift-01)

- (a) 10° (b) 8°
 (c) 4° (d) 12°

81. If $\frac{1}{\csc \theta + 1} + \frac{1}{\csc \theta - 1} = 2 \sec \theta$, $0^\circ < \theta < 90^\circ$, then the value of $\frac{\tan \theta + 2 \sec \theta}{\csc \theta}$ is:

खर्या $\frac{1}{\csc \theta + 1} + \frac{1}{\csc \theta - 1} = 2 \sec \theta$

θ , $0^\circ < \theta < 90^\circ$ प्रती सै $\frac{\tan \theta + 2 \sec \theta}{\csc \theta}$ कसी सशस

SSC CPO 09/12/2019 (Shift-02)

- (a) $\frac{2 + \sqrt{3}}{2}$ (b) $\frac{4 + \sqrt{2}}{2}$
 (c) $\frac{2 + \sqrt{2}}{2}$ (d) $\frac{4 + \sqrt{3}}{2}$

82. If $(\cos \theta + \sin \theta) : (\cos \theta - \sin \theta) = (\sqrt{3} + 1) : (\sqrt{3} - 1)$, $0^\circ < \theta < 90^\circ$, then what is the value of $\sec \theta$?

खर्या $(\cos \theta + \sin \theta) : (\cos \theta - \sin \theta) = (\sqrt{3} + 1) : (\sqrt{3} - 1)$, $0^\circ < \theta < 90^\circ$ प्रती सै $\sec \theta$ कसी सशस

SSC CPO 09/12/2019 (Shift-02)

- (a) 1 (b) 2
 (c) $\sqrt{2}$ (d) $\frac{2\sqrt{3}}{3}$

83. If $3 + \cos^2 \theta = 3(\cot^2 \theta + \sin^2 \theta)$, $0^\circ < \theta < 90^\circ$, then what is the value of $(\cos \theta + 2 \sin \theta)$?

खर्या $3 + \cos^2 \theta = 3(\cot^2 \theta + \sin^2 \theta)$, $0^\circ < \theta < 90^\circ$ प्रती सै $(\cos \theta + 2 \sin \theta)$ कसी सशस कइजन

SSC CPO 11/12/2019 (Shift-01)

- (a) $3\sqrt{2}$ (b) $\frac{\sqrt{3} + 2}{2}$
 (c) $\frac{2\sqrt{3} + 1}{2}$ (d) $\frac{3\sqrt{3} + 1}{2}$

84. If $\tan(11\theta) = \cot(7\theta)$, then what is the value of $\sin^2(6\theta) + \sec^2(9\theta) + \operatorname{cosec}^2(12\theta)$?

खर्या $\tan(11\theta) = \cot(7\theta)$ प्रती सै $\sin^2(6\theta) + \sec^2(9\theta) + \operatorname{cosec}^2(12\theta)$ कसी सशस कइजन

SSC CPO 11/12/2019 (Shift-01)

- (a) $\frac{35}{12}$ (b) $\frac{23}{6}$
 (c) $\frac{31}{12}$ (d) $\frac{43}{12}$

85. If $7 \sin^2 \theta + 3 \cos^2 \theta = 4$, $0^\circ < \theta < 90^\circ$, then the value of $(\tan^2 2\theta + \operatorname{cosec}^2 2\theta)$ is:

खर्या $7 \sin^2 \theta + 3 \cos^2 \theta = 4$, $0^\circ < \theta < 90^\circ$ प्रती सै $(\tan^2 2\theta + \operatorname{cosec}^2 2\theta)$ कसी सशस

SSC CPO 11/12/2019 (Shift-02)

- (a) 7 (b) $\frac{15}{4}$
 (c) $\frac{13}{3}$ (d) $\frac{13}{4}$

86. If $21 \tan \theta = 20$, then, $(1 + \sin \theta + \cos \theta) : (1 - \sin \theta + \cos \theta) = ?$

खर्या $21 \tan \theta = 20$ प्रती सै $(1 + \sin \theta + \cos \theta) : (1 - \sin \theta + \cos \theta) = ?$

SSC CPO 11/12/2019 (Shift-02)

- (a) 5 : 2 (b) 3 : 1
 (c) 7 : 3 (d) 2 : 1

87. If $2 \sin \theta + 15 \cos^2 \theta = 7$, $0^\circ < \theta < 90^\circ$, then what is the value of $\frac{3 - \tan \theta}{2 + \tan \theta}$?

खर्या $2 \sin \theta + 15 \cos^2 \theta = 7$, $0^\circ < \theta < 90^\circ$

प्रती सै $\frac{3 - \tan \theta}{2 + \tan \theta}$ कसी सशस

SSC CPO 12/12/2019 (Shift-01)

- (a) $\frac{1}{4}$ (b) $\frac{3}{4}$
 (c) $\frac{1}{2}$ (d) $\frac{5}{8}$

88. If $\operatorname{cosec} \theta = 1.25$, then

$\frac{4 \tan \theta - 5 \cos \theta + 1}{\sec \theta + 4 \cot \theta - 1} = ?$

खर्या $\operatorname{cosec} \theta = 1.25$ प्रती सै

$\frac{4 \tan \theta - 5 \cos \theta + 1}{\sec \theta + 4 \cot \theta - 1} = ?$

SSC CPO 12/12/2019 (Shift-01)

- (a) $\frac{9}{10}$ (b) 2
 (c) $\frac{10}{11}$ (d) $\frac{1}{2}$

89. If $\sin \theta - \cos \theta = 0$, $0^\circ < \theta < 90^\circ$, then the value of $\sin^4 \theta + \cos^4 \theta$ is:
 खर्या $\sin \theta - \cos \theta = 0$, $0^\circ < \theta < 90^\circ$ प्रती सै $\sin^4 \theta + \cos^4 \theta$ कसी सशस

SSC CPO 12/12/2019 (Shift-02)

- (a) $\frac{1}{3}$ (b) 1
 (c) $\frac{1}{2}$ (d) $\frac{1}{4}$

90. If $\sqrt{2} \sin(60^\circ - \alpha) = 1$, $0^\circ < \alpha < 90^\circ$, then α is equal to:

खर्या $\sqrt{2} \sin(60^\circ - \alpha) = 1$, $0^\circ < \alpha < 90^\circ$

प्रती सै α कसी सशस

SSC CPO 12/12/2019 (Shift-02)

- (a) 45° (b) 30°
 (c) 15° (d) 60°

91. If $3(\cot^2 \theta - \cos^2 \theta) = 1 - \sin^2 \theta$, $0^\circ < \theta < 90^\circ$, then θ is equal to:

खर्या $3(\cot^2 \theta - \cos^2 \theta) = 1 - \sin^2 \theta$, $0^\circ < \theta < 90^\circ$ प्रती सै θ कसी सशस

SSC CPO 13/12/2019 (Shift-01)

- (a) 30° (b) 60°
 (c) 45° (d) 15°

92. The value of $\tan^2 48^\circ - \operatorname{cosec}^2 42^\circ + \operatorname{cosec}(67^\circ + \theta) - \sec(23^\circ - \theta)$ is:

SSC CPO 13/12/2019 (Shift-01)

- (a) -1 (b) 0
 (c) 1 (d) -2

93. If $\frac{\cos \theta}{1 - \sin \theta} + \frac{\cos \theta}{1 + \sin \theta} = 4$, $0^\circ < \theta < 90^\circ$, then what is the value of $(\sec \theta + \operatorname{cosec} \theta + \cot \theta)$?

खर्या $\frac{\cos \theta}{1 - \sin \theta} + \frac{\cos \theta}{1 + \sin \theta} = 4$, $0^\circ < \theta < 90^\circ$

प्रती सै $(\sec \theta + \operatorname{cosec} \theta + \cot \theta)$ कसी सशस कइजन

SSC CPO 13/12/2019 (Shift-02)

- (a) $2 + \sqrt{3}$ (b) $\frac{1 + 2\sqrt{3}}{3}$
 (c) $1 + 2\sqrt{3}$ (d) $\frac{2\sqrt{3}}{3}$

94. If $\cos^2 \theta - \sin^2 \theta = \tan^2 \phi$, then which of the following is true?

खर्या $\cos^2 \theta - \sin^2 \theta = \tan^2 \phi$ प्रती सै

र कइ र सशस कइजन

SSC CPO 13/12/2019 (Shift-02)

- (a) $\cos \theta \cos \phi = 1$
 (b) $\cos \theta \cos = \sqrt{2}$
 (c) $\cos^2 \phi - \sin^2 \phi = \cot^2 \theta$
 (d) $\cos^2 \phi - \sin^2 \phi = \tan^2 \theta$

ANSWER KEY

1.(d)	2.(a)	3.(c)	4.(c)	5.(d)	6.(c)	7.(a)	8.(a)	9.(d)	10.(b)
11.(b)	12.(a)	13.(d)	14.(d)	15.(c)	16.(c)	17.(d)	18.(d)	19.(c)	20.(d)
21.(d)	22.(d)	23.(b)	24.(c)	25.(b)	26.(c)	27.(b)	28.(b)	29.(b)	30.(a)
31.(c)	32.(b)	33.(a)	34.(b)	35.(b)	36.(d)	37.(a)	38.(b)	39.(d)	40.(a)
41.(a)	42.(a)	43.(c)	44.(a)	45.(d)	46.(a)	47.(c)	48.(d)	49.(c)	50.(c)
51.(a)	52.(a)	53.(a)	54.(a)	55.(c)	56.(d)	57.(d)	58.(a)	59.(c)	60.(c)
61.(c)	62.(c)	63.(b)	64.(a)	65.(c)	66.(b)	67.(b)	68.(c)	69.(d)	70.(c)
71.(d)	72.(c)	73.(c)	74.(b)	75.(d)	76.(a)	77.(d)	78.(c)	79.(a)	80.(c)
81.(b)	82.(d)	83.(c)	84.(d)	85.(c)	86.(c)	87.(c)	88.(c)	89.(c)	90.(c)
91.(b)	92.(a)	93.(a)	94.(d)						

SOLUTIONS

1. (d) $\tan^2\theta + \tan^4\theta$
 $= \tan^2\theta(1 + \tan^2\theta)$
 $[\because \sec^2\theta - \tan^2\theta = 1]$
 $= \tan^2\theta \cdot \sec^2\theta$
 $= (\sec^2\theta - 1) \sec^2\theta$
 $= \sec^4\theta - \sec^2\theta$

2. (a) $\sin\theta + \operatorname{cosec}\theta = 2$
 Let $\theta = 90^\circ$, $\Rightarrow$ L.H.S = R.H.S
 $\therefore \sin^5\theta + \operatorname{cosec}^5\theta = 2$

Alternate Method:

$$\sin\theta + \operatorname{cosec}\theta = 2$$

$$\Rightarrow \sin\theta + \frac{1}{\sin\theta} = 2$$

$$\Rightarrow \frac{\sin^2\theta + 1}{\sin\theta} = 2$$

$$\Rightarrow \sin^2\theta - 2\sin\theta + 1 = 0$$

$$\Rightarrow (\sin\theta - 1)^2 = 0$$

$$\Rightarrow \sin\theta = 1$$

$$\Rightarrow \theta = 90^\circ$$

$$\therefore \sin^5\theta + \operatorname{cosec}^5\theta$$

$$= \sin^5 90^\circ + \operatorname{cosec}^5 90^\circ$$

$$= 1 + 1 = 2$$

3. (c) If, $\cos\theta - \sin\theta = \sqrt{2} \sin\theta$
 Comparing with $a\cos\theta - b\sin\theta = c$
 $a = 1, b = 1, c = \sqrt{2} \sin\theta$
 $\cos\theta + \sin\theta = \frac{\sqrt{a^2 + b^2 - c^2}}{2}$
 $= \frac{\sqrt{1+1-2\sin^2\theta}}{2} = \sqrt{2} \cos\theta$

Alternate Method:

$$\cos\theta - \sin\theta = \sqrt{2} \sin\theta$$

Squaring both sides,

$$\cos^2\theta + \sin^2\theta - 2\cos\theta\sin\theta = 2\sin^2\theta$$

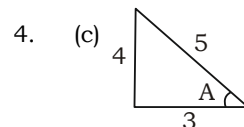
$$\Rightarrow 1 - 2\sin\theta \cos\theta = 2(1 - \cos^2\theta)$$

$$\Rightarrow 1 + 2\sin\theta \cos\theta = 2\cos^2\theta$$

$$\Rightarrow \sin^2\theta + \cos^2\theta + 2\sin\theta \cos\theta = 2\cos^2\theta$$

$$\Rightarrow (\sin\theta + \cos\theta)^2 = 2\cos^2\theta$$

$$\Rightarrow \sin\theta + \cos\theta = \sqrt{2} \cos\theta$$



$$\tan A = \frac{4}{3}$$

$$\therefore \sin A = \frac{4}{5}$$

5. (d) $(1 + \sin^4 A - \cos^4 A) \operatorname{cosec}^2 A$
 Let, $A = 45^\circ$
 $\Rightarrow (1 + \sin^4 45^\circ - \cos^4 45^\circ) \operatorname{cosec}^2 45^\circ$

$$= \left[1 + \left(\frac{1}{\sqrt{2}} \right)^4 - \left(\frac{1}{\sqrt{2}} \right)^4 \right] (\sqrt{2})^2 = 2$$

Alternate Method:

Consider,

$$(1 + \sin^4 A - \cos^4 A) \operatorname{cosec}^2 A$$

$$= (1 + (\sin^2 A - \cos^2 A)) \operatorname{cosec}^2 A$$

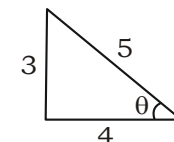
$$= (1 + \sin^2 A - \cos^2 A) \operatorname{cosec}^2 A$$

$$= (1 - \cos^2 A + \sin^2 A) \operatorname{cosec}^2 A$$

$$= 2\sin^2 A \operatorname{cosec}^2 A = 2$$

6. (c) Given,

$$\cot \theta = \frac{4}{3}$$

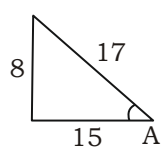


consider,

$$5p \cos^2\theta \sin\theta = \cot^2\theta$$

$$\Rightarrow 5p \left(\frac{4}{5} \right)^2 \times \frac{3}{5} = \left(\frac{4}{3} \right)^2$$

$$\Rightarrow p = \frac{16}{9} \times \frac{5}{3} \times \frac{25}{16} \times \frac{1}{5} = \frac{25}{27}$$

7. (a) 
 $\cos A = \frac{15}{17}$
 $\cot(90^\circ - A) = \tan A$
 $\therefore \tan A = \frac{8}{15}$

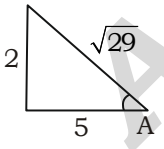
8. (a) $\frac{\cos 65^\circ}{\sin 25^\circ} + \frac{5 \sin 19^\circ}{\cos 71^\circ} - \frac{3 \cos 28^\circ}{\sin 62^\circ}$
 $= \frac{\cos(90^\circ - 25^\circ)}{\sin 25^\circ} + \frac{5 \sin(90^\circ - 71^\circ)}{\cos 71^\circ}$
 $- \frac{3 \cos(90^\circ - 62^\circ)}{\sin 62^\circ}$
 $= \frac{\sin 25^\circ}{\sin 25^\circ} + \frac{5 \cos 71^\circ}{\cos 71^\circ} - \frac{3 \sin 62^\circ}{\sin 62^\circ}$
 $= 1 + 5 - 3 = 3$

9. (d) $\sin \theta + \cos \theta = \frac{\sqrt{11}}{3}$
 Comparing with $a \sin \theta + b \cos \theta = c$
 $a = 1, b = 1, c = \frac{\sqrt{11}}{3}$

$$\cos \theta - \sin \theta = \sqrt{a^2 + b^2 - c^2}$$

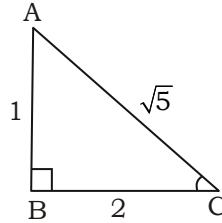
$$= \sqrt{1 + 1 - \frac{11}{9}} = \sqrt{\frac{7}{9}} = \frac{\sqrt{7}}{3}$$

10. (b) $A + B = 90^\circ$
 $\frac{\cot A}{\cot B} + \cos^2 A + \cos^2 B$
 $= \frac{\cot(90^\circ - B)}{\cot B} + \cos^2(90^\circ - B) + \cos^2 B$
 $= \tan^2 B + 1 = \sec^2 B = \sec^2(90^\circ - A)$
 $= \operatorname{cosec}^2 A$

11. (b) $\tan A = \frac{2}{5}$

 $\therefore \frac{\sec^2 A}{\operatorname{cosec}^2 A} = \frac{\sin^2 A}{\cos^2 A} = \tan^2 A = \frac{4}{25}$

12. (a) $k(\tan 45^\circ \sin 60^\circ)$
 $= \cos 60^\circ \cot 30^\circ$
 $\Rightarrow k \left(1 \times \frac{\sqrt{3}}{2} \right) = \frac{1}{2} \times \sqrt{3}$
 $\Rightarrow k = 1$

13. (d) $\frac{\cos 37^\circ}{\sin 53^\circ} - \cos 47^\circ \operatorname{cosec} 43^\circ$
 $= \frac{\cos(90^\circ - 53^\circ)}{\sin 53^\circ} - \cos 47^\circ \operatorname{cosec}$
 $(90^\circ - 47^\circ)$
 $= 1 - \cos 47^\circ \sec 47^\circ = 1 - 1 = 0$

14. (d) 
 $\therefore \cos A + \tan C$
 $= \frac{1}{\sqrt{5}} + \frac{1}{2} = \frac{2 + \sqrt{5}}{2\sqrt{5}}$

15. (c) $\sin A + \sin^2 A = 1$
 $\sin A = 1 - \sin^2 A = \cos^2 A$
 and $\cos^6 A = \sin^3 A$
 $\cos^4 A = \sin^2 A$
 $\therefore \cos^4 A + \cos^6 A = \sin^2 A + \sin^3 A$
 $= \sin A (\sin A + \sin^2 A)$
 $= \sin A \times 1 = \sin A$

16. (c) $\sec A - \tan A = p$ (i)
 $\Rightarrow \sec A + \tan A = \frac{1}{p}$ (ii)
 Adding equation (i) and (ii)
 $2 \sec A = p + \frac{1}{p}$

$\sec A = \frac{p^2 + 1}{2p}$
 17. (d) $2(\sin 1^\circ \times \sec 89^\circ) + 3(\cos 11^\circ \times \operatorname{cosec} 79^\circ) + 5(\tan 21^\circ \times \tan 69^\circ)$
 $= 2(\cos 89^\circ \times \sec 89^\circ) + 3(\sin 79^\circ \times \operatorname{cosec} 79^\circ) + 5(\tan 21^\circ \times \cot 21^\circ)$
 $= 2 + 3 + 5 = 10$

18. (d) $\sqrt{\frac{1 - \tan A}{1 + \tan A}}$
 $= \sqrt{\frac{1 - \frac{\sin A}{\cos A}}{1 + \frac{\sin A}{\cos A}}} = \sqrt{\frac{\cos A - \sin A}{\cos A + \sin A}}$
 $= \sqrt{\frac{\cos^2 A + \sin^2 A - 2 \sin A \cos A}{\cos^2 A - \sin^2 A}}$
 $= \sqrt{\frac{1 - 2 \sin A \cos A}{\cos^2 A - \sin^2 A}} = \sqrt{\frac{1 - \sin 2A}{\cos 2A}}$

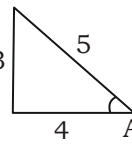
19. (c) $7 \sin^2 A + 3 \cos^2 A = 4$
 $\Rightarrow 4 \sin^2 A + 3(\sin^2 A + \cos^2 A) = 4$
 $\Rightarrow 4 \sin^2 A = 1$
 $\Rightarrow \sin A = \frac{1}{2} \Rightarrow A = 30^\circ$

$\therefore \cot A = \cot 30^\circ = \sqrt{3}$
 20. (d) $16 \operatorname{cosec}^2 \theta + 25 \sin^2 \theta$
 for $a = 16, b = 25$
 $\Rightarrow \text{Least value} = 2\sqrt{ab}$
 $= 2\sqrt{16 \times 25} = 2 \times 4 \times 5 = 40$

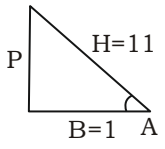
21. (d) $\operatorname{cosec} A + \cot A = 3$ (i)
 We know,
 $\operatorname{cosec}^2 A - \cot^2 A = 1$
 $\Rightarrow \operatorname{cosec} A - \cot A = \frac{1}{3}$ (ii)

from (i) and (ii)
 $2 \operatorname{cosec} A = \frac{10}{3}$

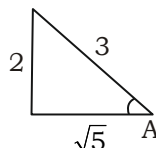
$\operatorname{cosec} A = \frac{5}{3}$


 $\Rightarrow \cos A = \frac{4}{5}$

22. (d) $\cos A = \frac{1}{11}$


 $P = \sqrt{11^2 - 1} = \sqrt{120}$
 $= 2\sqrt{30}$
 $\therefore \cot A = \frac{B}{P} = \frac{1}{2\sqrt{30}}$

23. (b) $\cos A = \frac{1}{2} \Rightarrow A = 60^\circ$
 $\therefore \sin(180^\circ - 60^\circ) = \sin(60^\circ)$
 $= \frac{\sqrt{3}}{2}$

24. (c) 

$$\sin A = \frac{2}{3}$$

$$\therefore (7 - \tan A)(3 + \cos A)$$

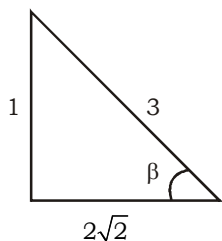
$$= \left(7 - \frac{2}{\sqrt{5}}\right) \left(3 + \frac{\sqrt{5}}{3}\right)$$

$$= \left(\frac{7\sqrt{5} - 2}{\sqrt{5}}\right) \left(\frac{9 + \sqrt{5}}{3}\right)$$

$$= \frac{63\sqrt{5} + 35 - 18 - 2\sqrt{5}}{3\sqrt{5}}$$

$$= \frac{61\sqrt{5} + 17}{3\sqrt{5}} = \frac{61}{3} + \frac{17}{3\sqrt{5}}$$

25. (b)



$$\sin \beta = \frac{1}{3},$$

$$(\sec \beta - \tan \beta)^2$$

$$= \left(\frac{3}{2\sqrt{2}} - \frac{1}{2\sqrt{2}}\right)^2 = \frac{1}{2}$$

26. (c) $\frac{\sin^2 39^\circ + \sin^2 (90^\circ - 39^\circ)}{\cos^2 35^\circ + \cos^2 (90^\circ - 35^\circ)}$

$$+ 3 \tan 15^\circ \tan 75^\circ$$

$$= \frac{\sin^2 39^\circ + \cos^2 39^\circ}{\cos^2 35^\circ + \sin^2 35^\circ} + 3 \tan 15^\circ \cot 15^\circ$$

$$= \frac{1}{1} + 3 = 4$$

27. (b) $\tan \theta + \cot \theta = 2$

$$\Rightarrow \theta = 45^\circ$$

$$\therefore 2 \tan^{25} \theta + 3 \cot^{20} \theta + 5 \tan^{30} \theta \cot^{15} \theta$$

$$= (2 \times 1) + (3 \times 1) + (5 \times 1 \times 1)$$

$$\Rightarrow 2 + 3 + 5 = 10$$

28. (b) $\sin (50^\circ + A) - \cos (40^\circ - A)$

$$= \cos [90^\circ - (50^\circ + A)] - \cos (40^\circ - A)$$

$$= \cos (40^\circ - A) - \cos (40^\circ - A) = 0$$

29. (b) $\sin \theta + \cos \theta = \frac{\sqrt{11}}{3}$

$$\text{Comparing with } a \sin \theta + b \cos \theta = c$$

$$a = 1, b = 1, c = \frac{\sqrt{11}}{3}$$

$$\sin \theta - \cos \theta = \sqrt{a^2 + b^2 - c^2}$$

$$= \sqrt{1 + 1 - \left(\frac{\sqrt{11}}{3}\right)^2} = \sqrt{2 - \frac{11}{9}} = \frac{\sqrt{7}}{3}$$

30. (a) $\sin \theta + \cos \theta = \sqrt{2} \cos \theta$

$$\sin \theta = \sqrt{2} \cos \theta - \cos \theta$$

$$\cos \theta = \frac{\sin \theta}{\sqrt{2} - 1}$$

$$\frac{\sin \theta - \cos \theta}{\sin \theta} = \frac{\sin \theta - \frac{\sin \theta}{\sqrt{2} - 1}}{\sin \theta}$$

$$= \frac{\sqrt{2} \sin \theta - \sin \theta - \sin \theta}{(\sqrt{2} - 1) \sin \theta}$$

$$= \frac{\sqrt{2} \sin \theta - 2 \sin \theta}{(\sqrt{2} - 1) \sin \theta}$$

$$= \frac{\sqrt{2} \sin \theta (1 - \sqrt{2})}{(\sqrt{2} - 1) \sin \theta} = -\sqrt{2}$$

31. (c) $\frac{2 \sin A - \cos A}{\sin A + \cos A} = 1$

$$\Rightarrow 2 \sin A - \cos A = \sin A + \cos A$$

$$\Rightarrow \sin A = 2 \cos A$$

$$\Rightarrow \tan A = 2$$

$$\therefore \cot A = \frac{1}{2}$$

32. (b) $2 \tan^2 45^\circ + \cos^2 30^\circ - \sin^2 60^\circ$

$$\Rightarrow 2 + \frac{3}{4} - \frac{3}{4} = 2$$

33. (a) $\cot^2 \theta = 1 - e^2$

$$[\because \operatorname{cosec}^2 \theta - 1 = \cot^2 \theta]$$

$$\operatorname{cosec}^2 \theta - 1 = 1 - e^2$$

$$\operatorname{cosec}^2 \theta = 2 - e^2$$

$$\operatorname{cosec} \theta = \sqrt{2 - e^2}$$

$$\operatorname{cosec} \theta + \cot^3 \theta \sec \theta$$

$$= \frac{1}{\sin \theta} + \frac{\cos^2 \theta}{\sin^3 \theta}$$

$$= \frac{\cos^2 \theta + \sin^2 \theta}{\sin^3 \theta} = \operatorname{cosec}^3 \theta$$

$$= (\sqrt{2 - e^2})^3 = (2 - e^2)^{\frac{3}{2}}$$

34. (b) Given,

$$x = \frac{2 \sin \theta}{1 + \cos \theta + \sin \theta}$$

$$\text{by the rationalization}$$

$$= \frac{2 \sin \theta}{1 + \cos \theta + \sin \theta} \times \frac{1 - \cos \theta + \sin \theta}{1 - \cos \theta + \sin \theta}$$

$$= \frac{2 \sin \theta (1 - \cos \theta + \sin \theta)}{(1 + \sin \theta)^2 - (\cos \theta)^2}$$

$$= \frac{2 \sin \theta (1 - \cos \theta + \sin \theta)}{1 + 2 \sin \theta + \sin^2 \theta - \cos^2 \theta}$$

$$= \frac{2 \sin \theta (1 - \cos \theta + \sin \theta)}{\sin^2 \theta + \cos^2 \theta + 2 \sin \theta + \sin^2 \theta - \cos^2 \theta}$$

$$= \frac{2 \sin \theta (1 - \cos \theta + \sin \theta)}{2 \sin \theta + 2 \sin^2 \theta}$$

$$= \frac{2 \sin \theta (1 - \cos \theta + \sin \theta)}{2 \sin \theta (1 + \sin \theta)}$$

$$= \frac{1 - \cos \theta + \sin \theta}{1 + \sin \theta} = x$$



SMART APPROACH:-

We can solve this problem by putting the value of $\theta = 90^\circ$

35. (b) Given

$$\left\{ \left(\frac{\sec \theta - 1}{\sec \theta + 1} \right)^n \right\} = (\operatorname{cosec} \theta - \cot \theta)$$

$$\text{R.H.S} = \operatorname{cosec} \theta - \cot \theta$$

$$= \frac{1}{\sin \theta} - \frac{\cos \theta}{\sin \theta}$$

$$= \frac{1 - \cos \theta}{\sin \theta} \dots \dots \dots [1]$$

$$= \frac{1 - \cos \theta}{\sin \theta} \times \frac{1 + \cos \theta}{1 + \cos \theta}$$

$$= \frac{1 - \cos^2 \theta}{\sin \theta (1 + \cos \theta)}$$

$$= \frac{\sin^2 \theta}{\sin \theta (1 + \cos \theta)}$$

$$= \frac{\sin \theta}{1 + \cos \theta} \dots \dots \dots [2]$$

Multiplying [1] and [2], we get-

$$\frac{1 - \cos \theta}{1 + \cos \theta} = (\operatorname{cosec} \theta - \cot \theta)^2$$

$$\frac{\sec \theta - 1}{\sec \theta + 1} = (\operatorname{cosec} \theta - \cot \theta)^2$$

$$\Rightarrow \left(\frac{\sec \theta - 1}{\sec \theta + 1} \right) = \operatorname{cosec} \theta - \cot \theta$$

$$\text{Hence, } n = \frac{1}{2} = 0.5$$

36. (d) We know that, $\sec^2 A - \tan^2 A = 1$
 $16\sec^2 A - 16\tan^2 A = 16(\sec^2 A - \tan^2 A)$
 $= 16 \times 1 = 16$

37. (a)

$$(2\cos^2 \theta - 1) \left[\frac{1 + \tan \theta}{1 - \tan \theta} + \frac{1 - \tan \theta}{1 + \tan \theta} \right]$$

$$= (2\cos^2 \theta - 1) \left[\frac{(1 + \tan \theta)^2 + (1 - \tan \theta)^2}{(1 - \tan \theta)(1 + \tan \theta)} \right]$$

$$= (2\cos^2 \theta - 1) \left[\frac{2 + 2\tan^2 \theta}{1 - \tan^2 \theta} \right]$$

$$= (2\cos^2 \theta - 1) \left[\frac{2(1 + \tan^2 \theta)}{1 - \frac{\sin^2 \theta}{\cos^2 \theta}} \right]$$

$$= (2\cos^2 \theta - 1) \left[\frac{2\sec^2 \theta}{\sec^2 \theta (\cos^2 \theta - (1 - \cos^2 \theta))} \right]$$

$$= (2\cos^2 \theta - 1) \left[\frac{2}{(2\cos^2 \theta - 1)} \right] = 2$$



SMART APPROACH:-

We can easily solve this problem by putting the value of $\theta = 30^\circ$

38. (b) We know that,

$$\therefore \tan \theta = \frac{\text{Perpendicular}}{\text{Base}}$$

$$\tan x = \frac{5}{1}$$

Hence, Perpendicular = 5 and Base = 1

By Pythagoras Theorem,

$$H = \sqrt{P^2 + B^2} = \sqrt{5^2 + 1^2} = \sqrt{26}$$

$$\sin x = \frac{\text{Perpendicular}}{\text{Hypotenuse}} = \frac{5}{\sqrt{26}}$$

39. (d) $\frac{\sin 80 \cos \theta - \sin 60 \cos 30}{\cos 20 \cos \theta - \sin 30 \sin 40}$

Multiplying and dividing by 2

$$= \frac{\sin 80 \cos \theta - \sin 60 \cos 30}{\cos 20 \cos \theta - \sin 30 \sin 40} \times \frac{2}{2}$$

$$= \frac{2 \sin 80 \cos \theta - 2 \sin 60 \cos 30}{2 \cos 20 \cos \theta - 2 \sin 30 \sin 40}$$

We know,

$$2 \sin A \cos B = \sin(A + B) + \sin(A - B)$$

$$2 \cos A \cos B = \cos(A + B) + \cos(A - B)$$

$$2 \sin A \sin B = \cos(A - B) - \cos(A + B)$$

$$= \frac{\sin 90 \sin 70 - (\sin 90 \cos 30)}{\cos 30 + \cos \theta - (\cos \theta - \cos 70)}$$

$$= \frac{\sin 70 - \sin 30}{\cos 30 + \cos 70}$$

We know,

$$\sin C - \sin D = 2 \cos \left(\frac{C+D}{2} \right) \sin \left(\frac{C-D}{2} \right)$$

$$\cos C - \cos D = 2 \cos \left(\frac{C+D}{2} \right) \sin \left(\frac{C-D}{2} \right)$$

$$= \frac{2 \cos 50 \sin 20}{2 \cos 50 \cos 20} = \tan 20$$

40. (a) We know,

$$\sin 45^\circ = \frac{1}{\sqrt{2}}$$

$$\cos 60^\circ = \frac{1}{2}$$

$$\tan 45^\circ = 1$$

$$\cot 45^\circ = 1$$

$$\therefore (\sin^4 45^\circ + \cos^4 60^\circ) + (\tan^4 45^\circ + \cot^4 45^\circ)$$

$$= \left\{ \left(\frac{1}{\sqrt{2}} \right)^4 + \left(\frac{1}{2} \right)^4 \right\} + (1 + 1)$$

$$= \left\{ \frac{1}{4} + \frac{1}{16} \right\} + 2$$

$$= \left\{ \frac{4+1}{16} \right\} + 2 = \frac{5}{16} + 2 = \frac{37}{16}$$

41. (a) $(1 + \cot A - \operatorname{cosec} A)(1 + \tan A + \sec A) - 1$

$$= \left(1 + \frac{\cos A}{\sin A} - \frac{1}{\sin A} \right) \left(1 + \frac{\sin A}{\cos A} + \frac{1}{\cos A} \right) - 1$$

$$= \left\{ \frac{(\sin A + \cos A)^2 - 1^2}{\sin A \cdot \cos A} \right\} - 1$$

$$= \left\{ \frac{\sin^2 A + \cos^2 A + 2 \sin A \cos A - 1}{\sin A \cdot \cos A} \right\} - 1$$

$$\text{put } \sin^2 A + \cos^2 A = 1$$

$$= \left\{ \frac{1 + 2 \sin A \cos A - 1}{\sin A \cdot \cos A} \right\} - 1$$

$$= \left\{ \frac{2 \sin A \cos A}{\sin A \cdot \cos A} \right\} - 1$$

$$= 2 - 1 = 1$$



SMART APPROACH:-

We can easily solve this problem by putting the value of $\theta = 45^\circ$

42. (a) We know that,

$$\operatorname{cosec}^2 A - \cot^2 A = 1$$

$$23 \operatorname{cosec}^2 A - 23 \cot^2 A$$

$$= 23(\operatorname{cosec}^2 A - \cot^2 A)$$

$$= 23(1) = 23$$

43. (c) Given,

$$\sin A = \frac{1}{3}$$

$$\therefore \cos A = \sqrt{1 - \sin^2 A}$$

$$= \sqrt{1 - \left(\frac{1}{3} \right)^2} = \frac{2\sqrt{2}}{3}$$

$$\sin B = \frac{1}{5}$$

$$\therefore \cos B = \sqrt{1 - \sin^2 B}$$

$$= \sqrt{1 - \left(\frac{1}{5} \right)^2} = \frac{2\sqrt{6}}{5}$$

Since the angles given in the second quadrant.

So,

$$\cos A = -\frac{2\sqrt{2}}{3}$$

$$\cos B = -\frac{2\sqrt{6}}{5}$$

We know that-

$$\cos(A - B) = \cos A \cos B + \sin A \sin B$$

$$= \frac{-2\sqrt{2}}{3} \times \frac{-2\sqrt{6}}{5} + \frac{1}{3} \times \frac{1}{5}$$

$$= \frac{2\sqrt{2}}{3} \times \frac{2\sqrt{2} \times \sqrt{3}}{5} + \frac{1}{3} \times \frac{1}{5} = \frac{8\sqrt{3} + 1}{15}$$

44. (a) We know that-

$$\sin(A + B) = \sin A \cos B + \cos A \sin B$$

$$\therefore \frac{\sin(A + B)}{\sin A \cos B}$$

$$= \frac{\sin A \cos B + \cos A \sin B}{\sin A \cos B}$$

$$= \frac{\sin A \cos B}{\sin A \cos B} + \frac{\cos A \sin B}{\sin A \cos B}$$

$$= 1 + \cot A \tan B$$

45. (d) $\sqrt{\frac{1 - \sin 45}{1 + \sin 45}} = \sqrt{\frac{1 - \frac{1}{\sqrt{2}}}{1 + \frac{1}{\sqrt{2}}}}$

$$= \sqrt{\frac{\sqrt{2} - 1}{\sqrt{2} + 1}} = \sqrt{\frac{\sqrt{2} - 1}{\sqrt{2} + 1} \times \frac{\sqrt{2} - 1}{\sqrt{2} - 1}}$$

$$= \sqrt{\frac{(\sqrt{2} - 1)^2}{(\sqrt{2})^2 - 1^2}} = \sqrt{2} - 1$$

$$\text{We know, } \sqrt{2} = \sec 45^\circ \text{ and } 1$$

$$= \tan 45^\circ$$

Hence Answer (d)

46. (a) $\cos^2 45^\circ + \cos^2 135^\circ + \cos^2 225^\circ + \cos^2 315^\circ$
 $= \cos^2 45^\circ + \{\cos(180^\circ - 45^\circ)\}^2 + \{\cos(180^\circ + 45^\circ)\}^2 + \{\cos(360^\circ - 45^\circ)\}^2$
 $= \cos^2 45^\circ + \{-\cos 45^\circ\}^2 + \{-\cos 45^\circ\}^2 + \{\cos 45^\circ\}^2$
 $= \left(\frac{1}{\sqrt{2}}\right)^2 + \left(\frac{1}{\sqrt{2}}\right)^2 + \left(\frac{1}{\sqrt{2}}\right)^2 + \left(\frac{1}{\sqrt{2}}\right)^2$
 $= \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = 2$

47. (c) $\frac{2\cos^3 \theta - \cos \theta}{\sin \theta - 2\sin^3 \theta}$
 $= \frac{\cos \theta (2\cos^2 \theta - 1)}{\sin \theta (1 - 2\sin^2 \theta)}$
 $= \frac{\cos \theta \times \cos 2\theta}{\sin \theta \times \cos 2\theta} = \cot \theta$

48. (d) $\cos 48^\circ = \frac{m}{n}$
 $\cos(90^\circ - 42^\circ) = \frac{m}{n}$
 $\sin 42^\circ = \frac{m}{n}$
 $\cos 42^\circ = \sqrt{1 - \sin^2 42^\circ}$
 $= \sqrt{1 - \frac{m^2}{n^2}}$
 $\Rightarrow \sqrt{\frac{n^2 - m^2}{n^2}} \Rightarrow \frac{\sqrt{n^2 - m^2}}{n}$

$\cot 42^\circ = \frac{\cos 42^\circ}{\sin 42^\circ}$

$= \frac{\frac{\sqrt{n^2 - m^2}}{n}}{\frac{m}{n}} \Rightarrow \frac{\sqrt{n^2 - m^2}}{m}$

$\sec 48^\circ = \frac{n}{m}$

$\therefore \sec 48^\circ - \cot 42^\circ$

$= \frac{n}{m} - \frac{\sqrt{n^2 - m^2}}{m} \Rightarrow \frac{n - \sqrt{n^2 - m^2}}{m}$

49. (c) $\therefore \sec^2 \theta (\sqrt{1 - \sin^2 \theta})$

$= \sec^2 \theta \times \cos \theta = \sec \theta$

50. (c) Given,
 $\cos A + \cos B + \cos C = 3$
 $\Rightarrow A = B = C = 0^\circ$
 $\sin A + \sin B + \sin C = 0$

51. (a) $\frac{\sin A}{1 + \cos A} + \frac{1 + \cos A}{\sin A}$
 $= \frac{\sin^2 A + (1 + \cos A)^2}{\sin A (1 + \cos A)}$
 $= \frac{\sin^2 A + 1 + 2\cos A + \cos^2 A}{\sin A (1 + \cos A)}$
 $= \frac{2(1 + \cos A)}{\sin A (1 + \cos A)} = 2\operatorname{cosec} A$



SMART APPROACH:-

We can easily solve this problem by putting the value of $\theta = 30^\circ$

52. (a) We know that-
 $\operatorname{cosec}^2 A - \cot^2 A = 1$
 $\Rightarrow (\operatorname{cosec} A + \cot A)(\operatorname{cosec} A - \cot A) = 1$
 $\Rightarrow \operatorname{cosec} A - \cot A = \frac{1}{\operatorname{cosec} A + \cot A}$

$\Rightarrow \operatorname{cosec} A - \cot A = \frac{1}{m}$

53. (a) $\cos \theta + \sin \theta = \sqrt{2} \cos \theta$
 squaring both side, we get-
 $\Rightarrow \sin^2 \theta + \cos^2 \theta + 2\sin \theta \cos \theta = 2\cos^2 \theta$
 $\Rightarrow 2\sin \theta \cos \theta = 2\cos^2 \theta - \sin^2 \theta - \cos^2 \theta$
 $\Rightarrow 2\sin \theta \cos \theta = \cos^2 \theta - \sin^2 \theta$
 $\Rightarrow 2\sin \theta \cos \theta = (\cos \theta - \sin \theta)(\cos \theta + \sin \theta)$

$\Rightarrow \cos \theta - \sin \theta = \frac{2\sin \theta \cos \theta}{\cos \theta + \sin \theta}$

$\Rightarrow \cos \theta - \sin \theta = \frac{2\sin \theta \cos \theta}{\sqrt{2} \cos \theta}$

$\Rightarrow \cos \theta - \sin \theta = \sqrt{2} \sin \theta$

54. (a) $(1 + \cot^2 \theta)(1 - \cos \theta)(1 + \cos \theta)$
 $= (1 + \cot^2 \theta)(1 - \cos^2 \theta)$
 $= \operatorname{cosec}^2 \theta \times \sin^2 \theta = 1$

55. (c) Given, $\cos \theta + \sec \theta = 2$
 We know,
 $\cos 0^\circ = 1$ and $\sec 0^\circ = 1$
 put $\theta = 0^\circ$
 $\sin^6 \theta + \cos^6 \theta = (\sin 0^\circ)^6 + (\cos 0^\circ)^6$
 $= 0 + 1 = 1$

56. (d) $\cos\left(\frac{-7\pi}{2}\right) = \cos\left(4\pi - \frac{\pi}{2}\right)$
 $= \cos \frac{\pi}{2} = 0$

57. (d) $(\operatorname{cosec} A + \cot A)(1 - \cos A)$
 $= \left(\frac{1}{\sin A} + \frac{\cos A}{\sin A}\right)(1 - \cos A)$
 $= \frac{(1 + \cos A)}{\sin A} \times (1 - \cos A)$
 $= \frac{1 - \cos^2 A}{\sin A} = \frac{\sin^2 A}{\sin A} = \sin A$



SMART APPROACH:-

We can easily solve this problem by putting the value of $\theta = 30^\circ$

58. (a) Given,
 $a\sin^{12} A + b\sin^{10} A + c\sin^8 A + \sin^6 A = 1$ (1)

$\cos A = \sin^2 A$
 squaring both sides:

$\Rightarrow \cos^2 A = \sin^4 A$

$\Rightarrow 1 - \sin^2 A = \sin^4 A$

$\Rightarrow 1 = \sin^4 A + \sin^2 A$

cubing both sides:

$\Rightarrow 1 = (\sin^4 A + \sin^2 A)^3$

$\Rightarrow 1 = \sin^{12} A + \sin^6 A + 3\sin^4 A \sin^2 A (\sin^4 A + \sin^2 A)$

$\Rightarrow 1 = \sin^{12} A + \sin^6 A + 3\sin^{10} A + 3\sin^8 A$

$\Rightarrow \sin^{12} A + 3\sin^{10} A + 3\sin^8 A + \sin^6 A = 1$ (2)

On comparing (1) and (2), we get
 $a = 1, b = 3$ and $c = 3$

Hence, $a + b + c = 7$

59. (c) $\cos(36^\circ - A)\cos(36^\circ + A) + \cos(54^\circ - A)\cos(54^\circ + A)$
 $= \cos(36^\circ + A)\cos(36^\circ - A) + \cos(90^\circ - (54^\circ - A))\cos(90^\circ - (54^\circ + A))$
 $= \cos(36^\circ + A)\cos(36^\circ - A) + \sin(36^\circ + A)\sin(36^\circ - A)$

We know

$[\cos(A - B) = \cos A \cos B + \sin A \sin B]$

$= \cos\{36^\circ + A - (36^\circ - A)\} = \cos 2A$

60. (c) $\frac{\sin 54^\circ}{\cos 36^\circ} + \frac{\sec 46^\circ}{\operatorname{cosec} 44^\circ}$
 $= \frac{\cos(90^\circ - 54^\circ)}{\cos 36^\circ} + \frac{\operatorname{cosec}(90^\circ - 46^\circ)}{\operatorname{cosec} 44^\circ}$
 $= \frac{\cos 36^\circ}{\cos 36^\circ} + \frac{\operatorname{cosec} 44^\circ}{\operatorname{cosec} 44^\circ} = 1 + 1 = 2$

61. (c) $4\cos \theta + 3\sin \theta = x$
 squaring both sides-
 $16\cos^2 \theta + 9\sin^2 \theta + 24\sin \theta \cos \theta = x^2$ (1)

Again,

$4\sin \theta - 3\cos \theta = y$

squaring both sides-

$16\sin^2 \theta + 9\cos^2 \theta - 24\sin \theta \cos \theta = y^2$ (2)

Adding equation (1) and (2), we get-

$x^2 + y^2 = 25\sin^2 \theta + 25\cos^2 \theta$

$= 25(\sin^2 \theta + \cos^2 \theta)$

$= 25(1) = 25$



SMART APPROACH:-

Special Case:

If $A\cos \theta + B\sin \theta = X$ and $A\sin \theta - B\cos \theta = Y$ then -

$X^2 + Y^2 = A^2 + B^2$

Given,

$4\cos \theta + 3\sin \theta = X$

$4\sin \theta - 3\cos \theta = Y$

$\therefore X^2 + Y^2 = 4^2 + 3^2$

$= 16 + 9 = 25$

$$62. (c) \frac{\cos^4 \theta - \sin^4 \theta}{\sin^2 \theta}$$

$$= \frac{(\cos^2 \theta - \sin^2 \theta)(\cos^2 \theta + \sin^2 \theta)}{\sin^2 \theta}$$

$$= \frac{\cos^2 \theta - \sin^2 \theta}{\sin^2 \theta}$$

$$= \frac{\cos^2 \theta}{\sin^2 \theta} - \frac{\sin^2 \theta}{\sin^2 \theta} = \cot^2 \theta - 1$$

$$63. (b) \frac{\sin A}{\cot A + \operatorname{cosec} A} - \frac{\sin A}{\cot A - \operatorname{cosec} A} - 1$$

$$= \sin A \left(\frac{1}{\cot A + \operatorname{cosec} A} - \frac{1}{\cot A - \operatorname{cosec} A} \right) - 1$$

$$= \sin A \left(\frac{\cot A - \operatorname{cosec} A - \cot A - \operatorname{cosec} A}{(\cot A + \operatorname{cosec} A)(\cot A - \operatorname{cosec} A)} \right) - 1$$

$$= \sin A \left(\frac{-2 \operatorname{cosec} A}{\cot^2 A - \operatorname{cosec}^2 A} \right) - 1$$

$$= \frac{-2 \sin A \operatorname{cosec} A}{-(\operatorname{cosec}^2 A - \cot^2 A)} - 1 = 2 - 1 = 1$$



SMART APPROACH:-

We can easily solve this problem by putting the value of $\theta = 45^\circ$

$$64. (a) \text{ Given } \sin^2 \theta = \cos^3 \theta$$

Squaring both sides

$$\sin^4 \theta = \cos^6 \theta \dots\dots\dots [1]$$

$$\cot^2 \theta - \cot^6 \theta = \cot^2 \theta - \frac{\cos^6 \theta}{\sin^6 \theta}$$

From equation [1],

$$= \cot^2 \theta - \frac{\sin^4 \theta}{\sin^6 \theta}$$

$$= \cot^2 \theta - \frac{1}{\sin^2 \theta}$$

$$= \cot^2 \theta - \operatorname{cosec}^2 \theta$$

$$= -(\operatorname{cosec}^2 \theta - \cot^2 \theta)$$

$$= -1$$

$$65. (c) \text{ Given, } \sin A = \frac{1}{2}$$

$$\Rightarrow A = 30^\circ$$

Now,

$$\tan A + \cos A = \tan 30^\circ + \cos 30^\circ$$

$$= \frac{1}{\sqrt{3}} + \frac{\sqrt{3}}{2} = \frac{2+3}{2\sqrt{3}} = \frac{5}{2\sqrt{3}}$$

$$66. (b) 1 + \sin^2 \theta - 3 \sin \theta \cos \theta = 0$$

Dividing the expression by $\sin^2 \theta$

$$\Rightarrow \operatorname{cosec}^2 \theta + 1 - 3 \cot \theta = 0$$

$$\Rightarrow (\operatorname{cosec}^2 \theta - 1) + 1 - 3 \cot \theta + 1 = 0$$

$$\Rightarrow \cot^2 \theta - 3 \cot \theta + 2 = 0$$

$$\Rightarrow \cot^2 \theta - 2 \cot \theta - \cot \theta + 2 = 0$$

$$\Rightarrow \cot \theta (\cot \theta - 2) - 1 (\cot \theta - 2) = 0$$

$$\Rightarrow (\cot \theta - 2)(\cot \theta - 1) = 0$$

Hence, $\cot \theta = 2$ or 1

Answer (B)

$$67. (b) \text{ Given } \cos^4 \alpha - \sin^4 \alpha = \frac{5}{6}$$

$$\Rightarrow (\cos^2 \alpha - \sin^2 \alpha)(\cos^2 \alpha + \sin^2 \alpha) = \frac{5}{6}$$

$$\Rightarrow (\cos^2 \alpha - \sin^2 \alpha)(1) = \frac{5}{6}$$

$$\Rightarrow \cos^2 \alpha - (1 - \cos^2 \alpha) = \frac{5}{6}$$

$$\Rightarrow 2 \cos^2 \alpha - 1 = \frac{5}{6}$$

$$68. (c) \tan 45^\circ + \sec 60^\circ = 1 + 2 = 3$$

$$\Rightarrow x = 3$$

$$69. (d) 4(\operatorname{cosec}^2 57^\circ + \tan^2 33^\circ) - \cos 90^\circ - y \tan^2 66^\circ \times \tan^2 24^\circ = \frac{y}{2}$$

$$4(\operatorname{cosec}^2 57^\circ - \cot^2 57^\circ) - \cos 90^\circ - y \tan^2 66^\circ \cot^2 66^\circ = \frac{y}{2}$$

$$4 - 0 - y = \frac{y}{2}$$

$$4 = \frac{y}{2} + y$$

$$\frac{3y}{2} = 4$$

$$y = \frac{8}{3}$$

$$70. (c) 4 - 2 \sin^2 \theta - 5 \cos \theta = 0, 0^\circ < \theta < 90^\circ, \cos \theta + \tan \theta = ?$$

Put $\theta = 60^\circ$

$$\cos \theta + \tan \theta = \frac{1}{2} + \sqrt{3} = \left(\frac{1+2\sqrt{3}}{2} \right)$$

$$71. (d) \sec 3x = \operatorname{cosec} (3x - 45^\circ), 3x \text{ is angle, } x = ?$$

$$\therefore A + B = 90$$

$$\sec A = \operatorname{cosec} B$$

$$3x + 3x - 45^\circ = 90^\circ$$

$$6x = 135^\circ$$

$$x = \frac{135^\circ}{6}$$

$$x = 22.5^\circ$$

$$72. (c) 7 \frac{\sin^2 30^\circ + \cos^2 60^\circ - \sec 35^\circ \cdot \sin 55^\circ}{\sec 60^\circ + \operatorname{cosec} 30^\circ} = ?$$

$$\Rightarrow \frac{\frac{1}{4} + \frac{1}{4} - \operatorname{cosec} 55^\circ \sin 55^\circ}{2+2}$$

$$\Rightarrow \frac{\frac{1}{2} - 1}{4} = \frac{-1}{8}$$

$$73. (c) \sin 3x = \cos(3x - 45^\circ), x = ?$$

$$\therefore A + B = 90^\circ$$

$$\sin A = \cos B$$

$$3x + 3x - 45^\circ = 90^\circ$$

$$6x = 135^\circ$$

$$x = 22.5$$

$$74. (b) \frac{\sin^2 30^\circ + \cos^2 60^\circ + \sec 45^\circ \cdot \sin 45^\circ}{\sec 60^\circ + \operatorname{cosec} 30^\circ} = ?$$

$$\Rightarrow \frac{\frac{1}{4} + \frac{1}{4} + \sqrt{2} \times \frac{1}{\sqrt{2}}}{2+2}$$

$$= \frac{\frac{1}{2} + 1}{4} = \frac{3}{8}$$

$$75. (d) \frac{\sin^2 52^\circ + 2 + \sin^2 38^\circ}{4 \cos^2 43^\circ - 5 + 4 \cos^2 47^\circ} = ?$$

$$\Rightarrow \frac{\sin^2 52^\circ + \cos^2 52^\circ + 2}{4(\cos^2 43^\circ + \sin^2 43^\circ) - 5}$$

$$\Rightarrow \frac{3}{-1} = -3$$

$$76. (a) \text{ If } A + B = 90^\circ$$

$$\tan A = \cot B$$

$$4\theta + \theta - 5 = 90^\circ$$

$$5\theta = 95^\circ$$

$$\theta = 19^\circ$$

$$77. (d) \cos^2 \theta - \sin^2 \theta = \frac{1}{2}$$

$$\cos 2\theta = \cos 60^\circ$$

$$\theta = 30^\circ$$

$$78. (c) \cot \theta = \frac{1}{\sqrt{3}}$$

$$\theta = 60^\circ$$

$$\Rightarrow \frac{2 - \sin^2 \theta}{1 - \cos^2 \theta} + (\operatorname{cosec}^2 \theta - \sec \theta)$$

$$\Rightarrow \frac{2 - \frac{3}{4}}{\frac{3}{4}} + \left(\frac{4}{3} - 2 \right)$$

$$\Rightarrow \frac{\frac{5}{4}}{\frac{3}{4}} + \frac{-2}{3} \Rightarrow \frac{5}{3} - \frac{2}{3} = 1$$

79. (a) $\sec^{107} \theta + \cos^{107} \theta = 2$

put $\theta = 0^\circ$

$= 1^{107} + 1^{107} = 2$

$= 1 + 1 = 2$ (satisfied)

Now,

$\sec \theta + \cos \theta$

$\Rightarrow \sec 0^\circ + \cos 0^\circ$

$\Rightarrow 1 + 1$

$= 2$

80. (c) $2\theta + 50^\circ + 4\theta + 16^\circ = 90^\circ$

$= 6\theta + 66 = 90$

$= 6\theta = 24$

$= \theta = 4^\circ$

81. (b) $\frac{1}{\operatorname{cosec} \theta + 1} + \frac{1}{\operatorname{cosec} \theta - 1} = 2$

$\sec \theta$

Put $\theta = 45^\circ$

$\frac{1}{\sqrt{2}+1} + \frac{1}{\sqrt{2}-1} = 2\sqrt{2}$

$2\sqrt{2} = 2\sqrt{2}$

(both conditions are satisfied)

Then,

$\frac{\tan \theta + 2 \sec \theta}{\operatorname{cosec} \theta}$

$\frac{1+2\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}+4}{2} = \frac{4+\sqrt{2}}{2}$

82. (d) $\frac{\cos \theta + \sin \theta}{\cos \theta - \sin \theta} = \frac{\sqrt{3}+1}{\sqrt{3}-1}$

put $\theta = 30^\circ$

$\frac{\cos 30^\circ + \sin 30^\circ}{\cos 30^\circ - \sin 30^\circ} = \frac{\sqrt{3}+1}{\sqrt{3}-1}$

$= \frac{\frac{\sqrt{3}}{2} + \frac{1}{2}}{\frac{\sqrt{3}}{2} - \frac{1}{2}} = \frac{\sqrt{3}+1}{\sqrt{3}-1}$

$= \frac{\sqrt{3}+1}{\sqrt{3}-1} = \frac{\sqrt{3}+1}{\sqrt{3}-1}$ (satisfied)

$\sec 30^\circ = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$

83. (c) $3 + \cos^2 \theta = 3(\cot^2 \theta + \sin^2 \theta)$

put $\theta = 60^\circ$

$= 3 + \frac{1}{4} = 3\left(\frac{1}{3} + \frac{3}{4}\right)$

$= \frac{13}{4} = 3 \times \frac{13}{12}$

$= \frac{13}{4} = \frac{13}{4}$ (satisfied)

So, $(\cos \theta + 2 \sin \theta)$

$= (\cos 60^\circ + 2 \sin 60^\circ)$

$= \frac{1}{2} + 2 \times \frac{\sqrt{3}}{2}$

$= \frac{1}{2} + \frac{\sqrt{3}}{1} = \frac{1+2\sqrt{3}}{2}$

84. (d) $\tan (110) = \cot (70)$

$\tan(110) = \tan(90^\circ - 70)$

$= 110 = 90^\circ - 70 = 180 = 90^\circ$

$\theta = 5^\circ$

Now,

$\sin^2 (60) + \sec^2 (90) + \operatorname{cosec}^2 (120)$

$= \sin^2 (6 \times 5) + \sec^2 (9 \times 5) + \operatorname{cosec}^2 (12 \times 5)$

$= \sin^2 30^\circ + \sec^2 45^\circ + \operatorname{cosec}^2 60^\circ$

$= \frac{1}{4} + \frac{2}{1} + \frac{4}{3} = \frac{3+24+16}{12} = \frac{43}{12}$

85. (c) $7 \sin^2 \theta + 3 \cos^2 \theta = 4$

We have to find value of $(\tan^2 2\theta + \operatorname{cosec}^2 2\theta)$

Let, put $\theta = 30^\circ$

$\Rightarrow 7 \sin^2 30^\circ + \cos^2 30^\circ = 4$

$\Rightarrow 7 \times \frac{1}{4} + 3 \times \frac{3}{4} = 4$

$\Rightarrow \frac{16}{4} = 4$

$\Rightarrow 4 = 4$ (Satisfied)

So,

$(\tan^2 2\theta + \operatorname{cosec}^2 2\theta)$

$= (\tan^2 2 \times 30 + \operatorname{cosec}^2 2 \times 30)$

$= (\tan^2 60^\circ + \operatorname{cosec}^2 60^\circ)$

$= 3 + \frac{4}{3} = \frac{13}{3}$

86. (c) $21 \tan \theta = 20$

find value of $(1 + \sin \theta + \cos \theta) : (1 - \sin \theta + \cos \theta)$

$= \tan \theta = \frac{20}{21} = \frac{P}{B}, h = 29$

$= (1 + \sin \theta + \cos \theta) = (1 - \sin \theta + \cos \theta)$

$= \left(1 + \frac{20}{29} + \frac{21}{29}\right) : \left(1 - \frac{20}{29} + \frac{21}{29}\right)$

$= \frac{29+20+21}{29} : \frac{29-20+21}{29}$

$= 70 : 30 = 7 : 3$

87. (c) Given, $2 \sin \theta + 15 \cos^2 \theta = 7$

Put $P = 4, B = 3, h = 5$

$\Rightarrow 2 \times \frac{4}{5} + 15 \times \frac{9}{25} = 7$

$\Rightarrow \frac{8}{5} + \frac{27}{5} = 7$

$\Rightarrow \frac{35}{5} = 7$

$\Rightarrow 7 = 7$ (satisfied)

Thus,

$\frac{3 - \tan \theta}{2 + \tan \theta} = \frac{3 - \frac{4}{3}}{2 + \frac{4}{3}} = \frac{\frac{5}{3}}{\frac{10}{3}} = \frac{5}{10} = \frac{1}{2}$

88. (c) Given,

$\operatorname{cosec} \theta = 1.25 = \frac{125}{100} = \frac{5}{4} = \frac{H}{P}$

Here, $H = 5, P = 4$ & $B = 3$

$\therefore \frac{4 \tan \theta - 5 \cos \theta + 1}{\sec \theta + 4 \cot \theta - 1}$

$= \frac{4 \times \frac{4}{3} - 5 \times \frac{3}{5} + 1}{\frac{5}{3} + 4 \times \frac{3}{4} - 1} = \frac{\frac{16}{3} - 3 + 1}{\frac{5}{3} + 3 - 1} = \frac{10}{11}$

89. (c) Given, $\sin \theta - \cos \theta = 0$

$\Rightarrow \sin \theta = \cos \theta$

Putting $\theta = 45^\circ$ satisfied.

Hence, $\sin^4 \theta + \cos^4 \theta$

$= \frac{1}{4} + \frac{1}{4} = \frac{2}{4} = \frac{1}{2}$

90. (c) $\sqrt{2} \sin (60^\circ - \alpha) = 1$

$\sin (60^\circ - \alpha) = \frac{1}{\sqrt{2}}$

$\sin (60 - \alpha) = \sin 45^\circ$

$\Rightarrow 60^\circ - \alpha = 45^\circ$

$\Rightarrow \alpha = 15^\circ$

91. (b) $3(\cot^2\theta - \cos^2\theta) = 1 - \sin^2\theta$

$$\Rightarrow 3(\cot^2\theta - \cos^2\theta) = \cos^2\theta$$

Put $\theta = 60^\circ$

$$\Rightarrow 3\left(\frac{1}{3} - \frac{1}{4}\right) = \frac{1}{4}$$

$$\Rightarrow 3 \times \frac{1}{12} = \frac{1}{4}$$

$$\Rightarrow \frac{1}{4} = \frac{1}{4} \text{ (Satisfied)}$$

92. (a) $\therefore \tan^2 48^\circ - \operatorname{cosec}^2 42^\circ + \operatorname{cosec} (67^\circ + \theta) - \sec (23^\circ - \theta)$

$$= \tan^2 48^\circ - \operatorname{cosec}^2 (90^\circ - 48^\circ) + \operatorname{cosec} (67^\circ + \theta) - \sec [90^\circ - (67^\circ + \theta)]$$

$$= \tan^2 48^\circ - \sec^2 48^\circ + \operatorname{cosec} (67^\circ + \theta) - \operatorname{cosec} (67^\circ + \theta)$$

$$= \tan^2 48^\circ - \sec^2 48^\circ$$

$$= -(\sec^2 48^\circ - \tan^2 48^\circ)$$

$$= -(\sec^2 48^\circ - \tan^2 48^\circ)$$

We know, $\sec^2 \theta - \tan^2 \theta = -1$

93. (a) $\frac{\cos \theta}{1 - \sin \theta} + \frac{\cos \theta}{1 + \sin \theta} = 4$

put $\theta = 60^\circ$

$$\Rightarrow \frac{\frac{1}{2}}{1 - \frac{\sqrt{3}}{2}} + \frac{\frac{1}{2}}{1 + \frac{\sqrt{3}}{2}} = 4$$

$$\Rightarrow \frac{2 + \sqrt{3} - 2\sqrt{3}}{1} = 4$$

$$\Rightarrow 4 = 4 \text{ (Satisfied)}$$

$$\sec \theta + \operatorname{cosec} \theta + \cot \theta$$

$$= \frac{2}{1} + \frac{2}{\sqrt{3}} + \frac{1}{\sqrt{3}} = 2 + \sqrt{3}$$

94. (d) $\cos^2 \theta - \sin^2 \theta = \tan^2 \phi$

$$\Rightarrow \frac{(\cos^2 \theta - \sin^2 \theta)}{1} = \sin^2 \phi / \cos^2 \phi$$

$$\Rightarrow \frac{(\cos^2 \theta - \sin^2 \theta)}{(\cos^2 \theta + \sin^2 \theta)} = \frac{\sin^2 \phi}{\cos^2 \phi}$$

By Componendo and Dividendo,

$$\Rightarrow \frac{\cos^2 \theta}{(-\sin^2 \theta)} = \frac{(\sin^2 \phi + \cos^2 \phi)}{(\sin^2 \phi - \cos^2 \phi)}$$

$$\Rightarrow \frac{(-\sin^2 \theta)}{\cos^2 \theta} = \frac{(\sin^2 \phi - \cos^2 \phi)}{(\sin^2 \phi + \cos^2 \phi)}$$

$$\Rightarrow \frac{\sin^2 \theta}{\cos^2 \theta} = \frac{(\sin^2 \phi - \cos^2 \phi)}{1}$$

$$\Rightarrow \tan^2 \theta = (\cos^2 \phi - \sin^2 \phi)$$



SMART APPROACH:-

If $\theta \propto \phi$, then, $\phi \propto \theta$

$$\cos^2 \theta - \sin^2 \theta = \tan^2 \phi$$

$$\therefore \cos^2 \phi - \sin^2 \phi = \tan^2 \theta$$





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HEIGHT & DISTANCE

19

प्रतिशब्दः तत्रैव उक्तः

1. A ladder leaning against a wall makes an angle θ with the horizontal ground such that $\cos\theta = \frac{5}{13}$. If the height of the top of the ladder from the wall is 18 m, then what is the distance (in cm) of the foot of the ladder from the wall?

किसी शास्त्र र जासकंसी खजंसायैक सखस जास ख
जावण र्स जेईसकंसी जेजस ॥ सकजंजसदी स कज

५. इजा सखसकस $\cos \theta = \frac{5}{13}$ सखसमहसह र जा

1. सी शसकसलजाक स $\frac{1}{4}$ इज्जत 18 cm सवसवज
 हरजसी सी शसकसप जजजस(foot)सक सहर्हि
 नी प्र सद पन्सद प्रेसएजसकनं

SSC CPO 23/11/2020 (Shift-1)

- (a) 19.5 (b) 13
(c) 7.5 (d) 18

2. A person was standing on a road near a mall. He was 1425 m away from the mall and able to see the top of the mall from the road in such a way that the top of a tree, which is in between him and the mall, was exactly in line of sight with the top of the mall. The tree height is 10 m and it is 30 m away from him. How tall (in m) is the mall?

ફિક્ષમતત્વવસદ જ્ઞ સર્ક સ્ક્રહ કપ્સી (ફિક્સ નસ) જા જ
 ય્વસ ય્વદ જ્ઞ સી સો 425 m સ્ક્ર સ્ક્રહી સ નસ્રમ જા
 િ (ફિક્સ સંદ જ્ઞ સર્ક સ્ક્રહા જ્ઞકં જઘી સ ક્ર જા સ્ક્રહ) જા
 દં પ્રી, જ સ્વસત્ક સગી કં સપ જાવદ જ્ઞ સર્ક સ્ક્રહ
 ત્તે જા સ્ક્રહ (ફિક્સ જાતજા જ્ઞ સર્ક સર્ક સ્ક્રહા જ્ઞકં સી જે જ
 હાપ્સ ન્સ) જ્ઞ સર્ક પ્રાચસ (ફિક્સ સર્ક જ્ઞ જ્ઞ 10m સર્ક
 પ જા સમઘસી સ્વમતત્વસી સ 30 m સ્ક્ર સ્ક્રહી સ ન
 ત્તે જા સ્વસદ જ્ઞ સર્ક સર્ક જ્ઞ મ સર્ક પ્રે સ્ક્ર જા સર્ક ન્સ

SSC CPO 23/11/2020 (Shift-1)

- (a) 475 (b) 300
(c) 425 (d) 525

3. The length of the shadow of a vertical pole on the ground is 18 m. If the angle of elevation of the sun at that time is θ , such that

$\cos\theta = \frac{12}{13}$ then what is the height

(in m) of the pole?

क स्रूप्रज्ज 18 m सखसमहसी से दमसे निष्कज

$$\text{गड़मइस्क जंजो सी स कजसवसकस} \cos \theta = \frac{12}{13}$$

ख,सवजं) आंजक स $\frac{1}{4}$ द्वज्ज m सदं प्रै सए जासक नंझ

SSC CPO 23/11/2020 (Shift-2)

- (a) 7.5 (b) 9
(c) 18 (d) 12

4. Asha and Suman's mud forts have heights 9 cm and 16 cm. They are 24 cm apart. How far (in cm) are the fort tops from each other?

[illegible]

SSC CPO 23/11/2020 (Shift-2)

- (a) 16 (b) 7
(c) 25 (d) 24

5. The length of the shadow of a vertical pole on the ground is 36 m. If the angle of elevation of the sun at that time is θ , such that

$\sec\theta = \frac{13}{12}$ then what is the height

(in m) of the pole?

तकी सप अंजूप्रसर्वप्रज्ञक र्स जईस नस (इं
रज स नखज्जक सडूप्रज्ज36 mसखसमहसी
ी दमसी र्मिअक ज्माइमइसक ज्जज्म) सही स क्जसख

$$\tan \sec \theta = \frac{13}{12} \text{ सख,सवजंसर्वप्रजाक स\%द्वज्ज}$$

न द एनस्पदं प्रे स ए ज्ञा सक नं प्रा

SSC CPO 24/11/2020 (Shift-1)

- (a) 12 (b) 9
(c) 18 (d) 15

6. Asha and Suman's mud forts have heights 9 cm and 16 cm. If the fort tops are at 25 cm apart from each other, then the distance (in cm) between two forts is:

पञ्चमपञ्चमस्यैवैकसकसंस्तद्वैकसकसु जङ्गलक
%द्वयम् 9 cm स 16 cm सख्यसमस्तसु जङ्गलकं
लगायत्किमर्थीन्सी सं 25 cm सहसिख्यसमस्तसंख्यं
जङ्गलकसु द्वैकसक सहसिख्यं cm संस्तद्वैकसकसं

SSC CPO 24/11/2020 (Shift-1)

- (a) 24 (b) 16
(c) 7 (d) 25

7. A ladder is resting against a wall. The angle between the foot of the ladder and wall is 60° , and the foot of the ladder is 3.6 m away from the wall. The length of the ladder (in m) is:

हर जसक सवन .स्यैक सखैखी शसक जगइ मइ
क जगइ 60° सवन जसो शसक जग जगसह र ज
ी 3.6 m सहिखी शसक सूपूज्ज m सहि
ए जसक नं

SSC CPO 24/11/2020 (Shift-2)

- (a) 5.4 (b) 3.6
(c) 14.4 (d) 7.2

8. Let A and B be two towers with same base. From the midpoint of the line joining their feet, the angles of elevation of the tops of A and B are 30° and 60° , respectively. The ratio of the heights of B and A is:

दइज्जAसप जासBसी दइसप ज्जजसर ज्ज सहजं
द इज्जAसप जासBइज्जA इज्जAसप ज्जजज्जAजं
इज्जAसप जासBसं) ज्जAसंदधमू हैसी, सAसप जा
Bसकंसलज्जAज्जAजगइमइसकज्जA दलज्जA30°
प जास60°सखसBसप जासAसक स%इज्जAज
प है ज्जAसप ज्जAसकंसल

SSC CPO 24/11/2020 (Shift-2)

- (a) 1 : 3 (b) 3 : 1
(c) 1 : 2 (d) $1 : \sqrt{3}$

17. A kite is flying at a height of 123 m. The thread attached to it is assumed to be stretched straight and makes an angle of 60° with the level ground. The length of the string is (nearest to a whole number):

किस वस्तु पर 123 मीटर ऊँचाई पर एक गुड़िया उड़ानवाली है। गुड़िया के तार को माना जाता है कि वह सीधे खिंचा हुआ है और ज़मीन के सतह के साथ 60° का कोण बनाता है। तार की लंबाई (पूर्णांक के निकटतम) क्या होगी?

SSC CPO 11/12/2019 (Shift - 01)

- (a) 140 m (b) 139 m
(c) 142 m (d) 138 m

18. From a point 12m above the water level, the angle of elevation of the top of a hill is 60° and the angle of depression of the base of the hill is 30° . What is the height (in m) of the hill?

एक जल सतह से 12 मीटर ऊँचाई पर, एक पहाड़ के शीर्ष के लिए उन्नयन कोण 60° है और पहाड़ के आधार के लिए अवनयन कोण 30° है। पहाड़ की ऊँचाई (मीटर में) क्या होगी?

SSC CPO 11/12/2019 (Shift - 01)

- (a) 36 (b) $48\sqrt{3}$
(c) 48 (d) $36\sqrt{3}$

19. As observed from the top of a lighthouse 45 m high above the sealevel, the angle of depression of a ship, sailing directly towards it, changes from 30° to 45° . The distance travelled by the ship during the period of observation is: (Your answer should be correct to one decimal place.)

एक लighthouse की शीर्ष से 45 मीटर ऊँचाई पर, एक जहाज के लिए अवनयन कोण 30° से 45° तक बदलता है। अवलोकन के दौरान जहाज द्वारा तय की गई दूरी (आपका उत्तर एक दशमलव स्थान तक सही होना चाहिए) क्या होगा?

SSC CPO 11/12/2019 (Shift - 02)

- (a) 32.9 m (b) 33.4 m
(c) 36.9 m (d) 24.8 m

20. A 22 m long ladder (whose foot is on the ground) leans against a wall making an angle of 60° with the wall. What is the height (in m) of the point where the ladder touches the wall from the ground?

किस 22 मीटर लंबी सीढ़ी (जिसका पैर ज़मीन पर है) एक दीवार के साथ 60° का कोण बनाती है। दीवार के उस बिंदु की ऊँचाई (मीटर में) क्या होगी जहाँ सीढ़ी दीवार को छूती है?

SSC CPO 11/12/2019 (Shift - 02)

- (a) $\frac{22\sqrt{2}}{3}$ (b) $11\sqrt{2}$
(c) 11 (d) $11\sqrt{3}$

21. An observer who is 1.62 m tall is 45 m away from a pole. The angle of elevation of the top of the pole from his eyes is 30° . The height (in m) of the pole is closed to:

1.62 मीटर लंबाई का एक अवलोकक एक 45 मीटर दूर एक खंभे के शीर्ष से 30° का उन्नयन कोण देखता है। खंभे की ऊँचाई (मीटर में) क्या होगी?

SSC CPO 12/12/2019 (Shift - 01)

- (a) 26.8 (b) 25.8
(c) 26.2 (d) 27.6

22. From the top of a lamp post of height x metres, two objects on the ground on the same side of it (and in line with the foot of the lamp post) are observed at angles of depression of 30° and 60° , respectively. The distance between the objects is $32\sqrt{3}$ m. The value of x is:

एक लैंप पोस्ट की शीर्ष से x मीटर की ऊँचाई पर, दो वस्तुएँ ज़मीन पर एक ही ओर (लैंप पोस्ट के पैर के साथ एक रेखा में) अवलोकित की जाती हैं। अवनयन कोण क्रमशः 30° और 60° हैं। वस्तुओं के बीच की दूरी $32\sqrt{3}$ मीटर है। x का मान क्या होगा?

SSC CPO 12/12/2019 (Shift - 01)

- (a) 54 (b) 48
(c) 45 (d) 36

23. The angle of elevation of the top of a tree from a point on the ground which is 300 m away from the tree is 30° . When the tree grew up, its angle of elevation of the top became 60° from the same point. How much did the tree grow?

एक वृक्ष के शीर्ष के उन्नयन कोण 300 मीटर दूर एक बिंदु से 30° है। जब वृक्ष बढ़ा, तो उस बिंदु से उन्नयन कोण 60° हो गया। वृक्ष की वृद्धि कितनी थी?

SSC CPO 12/12/2019 (Shift - 02)

- (a) 342 m (b) 364 m
(c) 384 m (d) 346 m

24. The angle of elevation of a ladder leaning against a wall is 60° and the foot of the ladder is 6.5 m away from the wall. The length of the ladder is:

एक सीढ़ी को एक दीवार के साथ 60° का कोण बनाते हुए 6.5 मीटर दूर खड़ा किया गया है। सीढ़ी की लंबाई क्या होगी?

SSC CPO 12/12/2019 (Shift - 02)

- (a) $6.5\sqrt{3}$ m (b) $13\sqrt{3}$ m
(c) 12 m (d) 13 m

25. A ladder leaning against a window of a house makes an angle of 60° with the ground. If the distance of the foot of the ladder from the wall is 4.2 m, then the height of the point, where the ladder touches the window from the ground is closed to:

एक सीढ़ी एक घर के खिड़की के साथ 60° का कोण बनाती है। यदि सीढ़ी के पैर से दीवार तक की दूरी 4.2 मीटर है, तो सीढ़ी के छूने वाले बिंदु की ऊँचाई (जमीन से) क्या होगी?

SSC CPO 13/12/2019 (Shift - 01)

- (a) 7.3 m (b) 6.8 m
(c) 7.8 m (d) 7 m

26. A pole of length 7 m in fixed vertically on the top of a tower. The angle of elevation of the top of the pole observed from a point on the ground is 60° and the angle of depression of the same point on the ground from the top of the tower is 45° .

एक 7 मीटर लंबी छड़ एक टावर की शीर्ष पर लंबी है। ज़मीन से एक बिंदु से छड़ के शीर्ष के उन्नयन कोण 60° है और उस बिंदु से टावर की शीर्ष के अवनयन कोण 45° है।

SSC CPO 13/12/2019 (Shift - 01)

- (a) $7(2\sqrt{3} - 1)$ (b) $\frac{7}{2}(\sqrt{3} + 2)$
(c) $7\sqrt{3}$ (d) $\frac{7}{2}(\sqrt{3} + 1)$

27. Two points A and B are on the ground and on opposite sides of a tower. A is closer to the foot of tower by 42 m than B. If the angles of elevation of the top of the tower, as observed from A and B are 60° and 45° , respectively, then the height of the tower is closed to:

SSC CPO 13/12/2019 (Shift - 02)

- (a) 98.6 m
(b) 99.4 m
(c) 88.2 m
(d) 87.6 m

28. The angles of elevation of a pole from two points which are 75 m and 48 m away from its base and makes angle α and β respectively. If α and β are complementary, then the height of the tower is:

किसे प्रश्नक संजानी से 75 m प जास 48 m क हर्निस नसते जासहं जू हैप जी सी प्रश्नक संग इमइ क जास दलजस प जास सखस महस जास कि खपवज) प्रश्नक संग दुज्जा ए जासक त रि

SSC CPO 13/12/2019 (Shift - 02)

- (a) 54.5 m
(b) 60 m
(c) 61.5 m
(d) 50 m

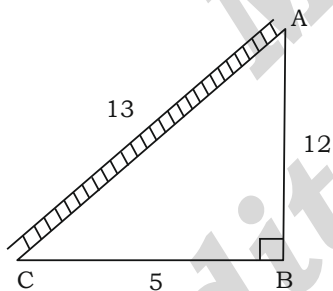
किसे नसहं जू हैस प जास B सते जासखस ज कि प जास क संहं जू प जास कि हर्निस क सत् नव तल जास प्रखस A, B स संवै इ जस प्र जास क सं ज क सं 2 m प तमक सह क प सखस महस प जास B सी प र उ जास इ स क सि सि जास क सं सजा स क जा इमइ क जास दलजस 60° प जास 45° खपवज जासक गृह जास उ 3 ज सतक वइ सख

ANSWER KEY

1.(c)	2.(a)	3.(a)	4.(c)	5.(d)	6.(a)	7.(d)	8.(b)	9.(c)	10.(c)
11.(b)	12.(a)	13.(c)	14.(b)	15.(d)	16.(a)	17.(c)	18.(c)	19.(a)	20.(d)
21.(d)	22.(b)	23.(d)	24.(d)	25.(a)	26.(d)	27.(b)	28.(b)		

SOLUTIONS

1. (c)



$$\cos \theta = \frac{5}{13} = \frac{\text{Base}}{\text{Hypotenuse}}$$

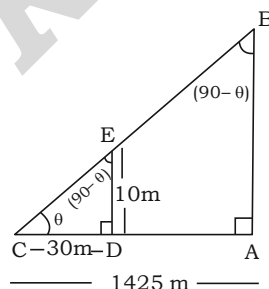
$$AB = \sqrt{13^2 - 5^2} = 12$$

$$\therefore 12 = 18 \text{ m}$$

$$5 = \frac{18}{12} \times 5$$

$$= 7.5 \text{ m}$$

2. (a)

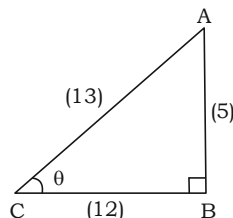


$$AB = ?$$

$$\therefore \frac{10}{30} = \frac{AB}{1425}$$

$$AB = 475 \text{ m}$$

3. (a)



$$\therefore \cos \theta = \frac{12}{13} = \frac{B}{H}$$

$$AB = \sqrt{13^2 - 12^2}$$

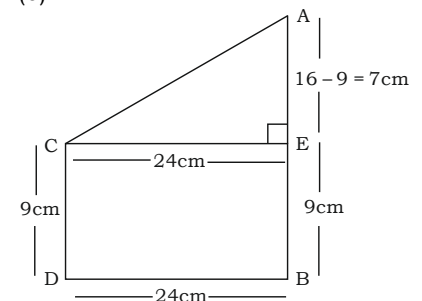
$$= (5 \text{ unit})$$

$$\therefore 12 \text{ unit} = 18 \text{ m}$$

$$\text{Height of a pole AB (5 unit)}$$

$$= \frac{18}{12} \times 5 = 7.5 \text{ m}$$

4. (c)



$$\therefore AE = 7 \text{ cm}$$

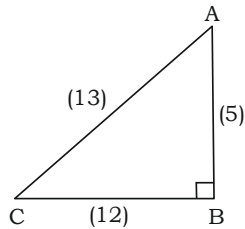
$$CE = 24 \text{ cm}$$

$$AC = ?$$

$$AC = \sqrt{24^2 + 7^2} = \sqrt{576 + 49}$$

$$= \sqrt{625} = 25 \text{ cm}$$

5. (d)



$$\therefore \sec \theta = \frac{13}{12} = \frac{H}{B}$$

$$AB = \sqrt{13^2 - 12^2}$$

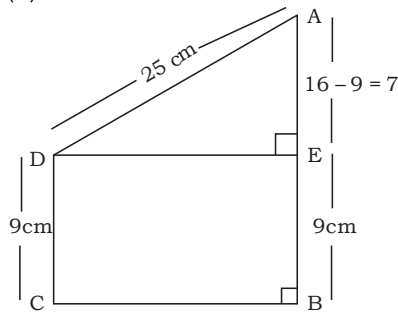
$$= (5 \text{ unit})$$

$$\therefore (12 \text{ unit}) = 36 \text{ m}$$

$$(5 \text{ unit}) = 15 \text{ m}$$

Height of the pole = 15 m

6. (a)



$$AD = 25 \text{ cm}$$

$$AE = 7 \text{ cm}$$

$$DE = BC = ?$$

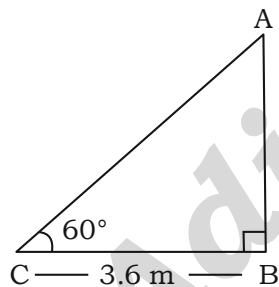
$$BC = \sqrt{25^2 - 7^2}$$

$$= \sqrt{625 - 49}$$

$$= \sqrt{576}$$

$$= 24 \text{ cm}$$

7. (d)



Length of Ladder AC = ?

$$\therefore \cos \theta = \frac{B}{H}$$

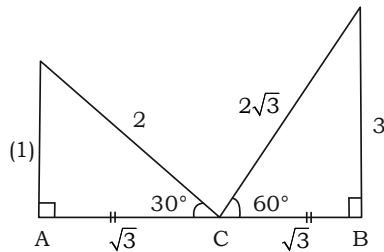
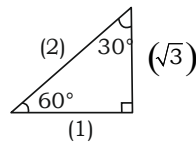
$$\cos 60^\circ = \frac{3.6}{AC}$$

$$\frac{1}{2} = \frac{3.6}{AC}$$

$$AC = 7.2 \text{ m}$$

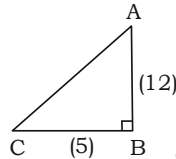
8. (b)

$\therefore$ In a right angle triangle



Ratio, height of B : A = 3 : 1

9. (c)

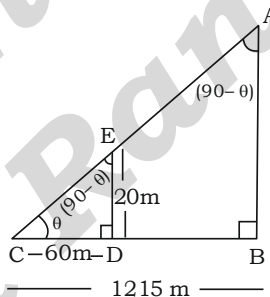


$$\therefore \tan \theta = \frac{12}{5} = \frac{P}{B}$$

$$\therefore (12 \text{ unit}) = 24 \text{ m}$$

$$(5 \text{ unit}) = 10 \text{ m}$$

10. (c)



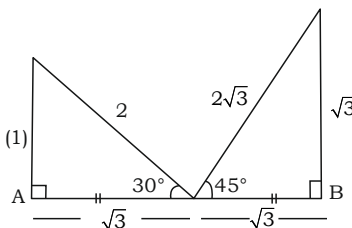
AB = Height of a mall = ?

$$\therefore \frac{20}{60} = \frac{AB}{1215}$$

$$AB = \frac{1215}{3}$$

$$= 405 \text{ m}$$

11. (b)

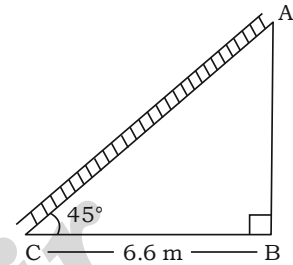
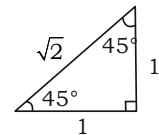


Ratio, Height of A : B = 1 : sqrt(3)

12. (a)

The length of the ladder AC = ?

$\therefore$ In a right angle triangle



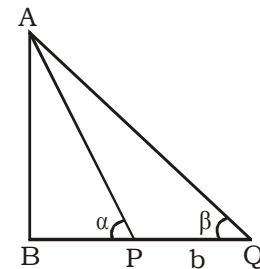
ATQ

$$1 \text{ unit} = 6.6 \text{ m}$$

then,

$$\sqrt{2} \text{ unit (AC)} = 6.6\sqrt{2} \text{ m}$$

13. (c)



Let height of the pole is x cm

In $\triangle ABQ$

$$= \tan \beta = \frac{x}{BQ}$$

$$BQ = x \cot \beta$$

Similarly

In $\triangle ABP$

$$\tan \alpha = \frac{x}{BP}$$

$$BP = x \cot \alpha$$

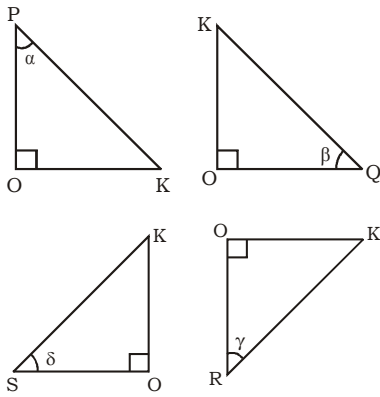
We know,

$$BQ = BP + PQ$$

$$x \cot \beta = x \cot \alpha + b$$

$$x = \frac{b}{\cot \beta - \cot \alpha}$$

14. (b)



Let K is the point on the top of the tower and the height of the clock tower OK be h cm. OK is perpendicular to PR and SQ.

In $\triangle POK$,

$$\tan \alpha = \frac{OK}{OP}$$

$$OP = \frac{h}{\tan \alpha}$$

$$OP = h \cot \alpha$$

Similarly,

In $\triangle QOK$

$$\tan \beta = \frac{OK}{OQ}$$

$$OQ = \frac{h}{\tan \beta}$$

$$OQ = h \cot \beta$$

In $\triangle POQ$, OP is perpendicular to OQ, then

$$PQ^2 = OP^2 + OQ^2$$

$$PQ^2 = h^2 \cot^2 \alpha + h^2 \cot^2 \beta$$

$$PQ^2 = h^2 (\cot^2 \alpha + \cot^2 \beta)$$

Similarly,

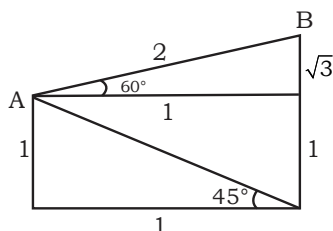
$$RS^2 = h^2 (\cot^2 \gamma + \cot^2 \delta)$$

Now,

$$\left(\frac{PQ}{RS}\right)^2 = \frac{[h^2(\cot^2 \alpha + \cot^2 \beta)]}{[h^2(\cot^2 \gamma + \cot^2 \delta)]}$$

$$\left(\frac{PQ}{RS}\right)^2 = \frac{(\cot^2 \alpha + \cot^2 \beta)}{(\cot^2 \gamma + \cot^2 \delta)}$$

15. (d)



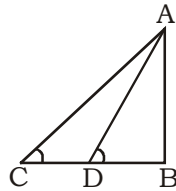
Given that,

$$1 \text{ unit} = 36$$

Then,

$$\sqrt{3} + 1 \text{ unit} = 36 (\sqrt{3} + 1) = 98$$

16. (a)



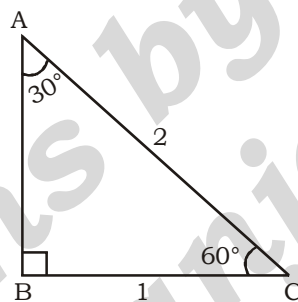
Note : When complementary angles are given in the question then, height of tower

$$= \sqrt{BD \times BC}$$

Height of the tower (AB)

$$= \sqrt{32 \times 18} = 24 \text{ m}$$

17. (c)

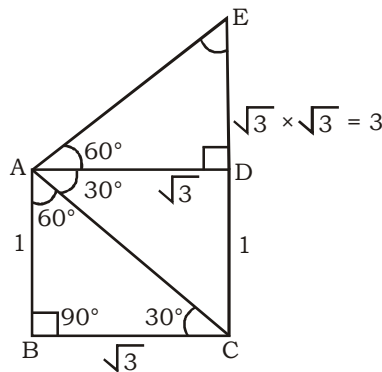


height (AB) = 123 m (given)

$$\text{The length of string (AC)} = \frac{123}{\sqrt{3}} \times 2$$

$$= 82\sqrt{3} = 82 \times 1.73 = 142 \text{ m}$$

18. (c)



AB = 12 m (given)

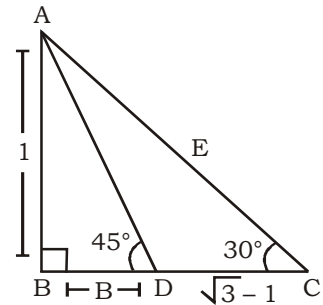
height of the hill = (ED + CD) = (3 + 1) = 4 unit

$$1 \text{ unit} = 12$$

Then,

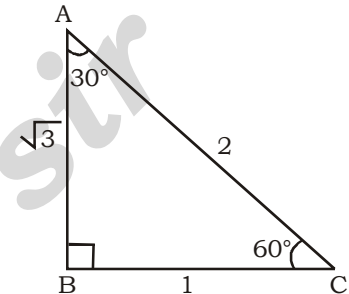
$$4 \text{ unit} = \frac{12}{1} \times 4 = 48 \text{ m}$$

19. (a)



$$\Rightarrow \frac{45}{1} \times (\sqrt{3} - 1) = 32.9 \text{ m}$$

20. (d)

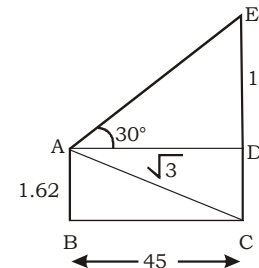


Ladder (AC) 2 unit = 22 m then,

$$\sqrt{3} \text{ unit (AB)} = 11\sqrt{3} \text{ m}$$

$$AB = \frac{22}{2} \times \sqrt{3} = 11\sqrt{3}$$

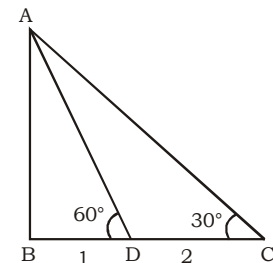
21. (d)



$$DE = \frac{45}{\sqrt{3}} \times 1 = 15\sqrt{3} = 25.98$$

Height of the pole = CD + DE = 1.62 + 25.98 = 27.6 m

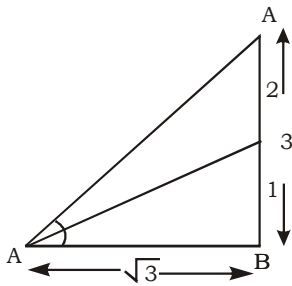
22. (b)



Height of the lamp-post,

$$AB = \frac{32\sqrt{3}}{2} \times \sqrt{3} = \frac{96}{2} = 48 \text{ m}$$

23. (d)



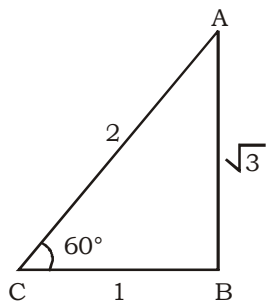
$$\sqrt{3} \text{ unit} = 300$$

Length of the tree increased by

$$= \frac{300}{\sqrt{3}} \times 2 = 100 \times 2\sqrt{3}$$

$$= 200 \times 1.732 = 346.4 \text{ m}$$

24. (d)



Given, $BC = 6.5 \text{ m}$

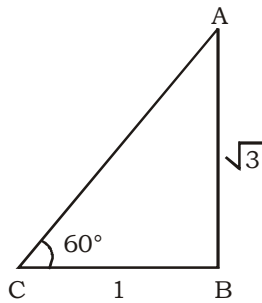
In $\triangle ABC$

$$\cos 60^\circ = \frac{BC}{AC}$$

$$\Rightarrow \frac{1}{2} = \frac{6.5}{AC}$$

$$\Rightarrow AC = 2 \times 6.5 = 13 \text{ m}$$

25. (a)

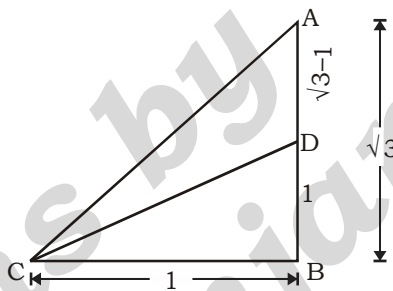


1 unit(AB) = 4.2 cm
then,

$$\sqrt{3} \text{ unit(AB)} = \frac{4.2}{1} \times \sqrt{3}$$

$$= 4.2 \times 1.73 = 7.3 \text{ m}$$

26. (d)



Let the pole be AD and Tower be BD.

Given, $AD = 7 \text{ m}$

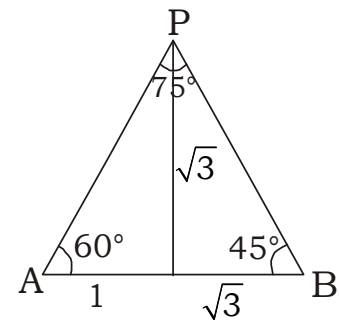
$$(\sqrt{3} - 1) \text{ unit} = 7 \text{ m}$$

$$\text{So, The tower } BD = \frac{7}{(\sqrt{3} - 1)} \times 1$$

$$\Rightarrow \frac{7}{\sqrt{3} - 1} \times \frac{\sqrt{3} + 1}{\sqrt{3} + 1} = \frac{7(\sqrt{3} + 1)}{2} \text{ m}$$



27. (b)



Given that

$$\sqrt{3} - 1 \text{ unit} : 42$$

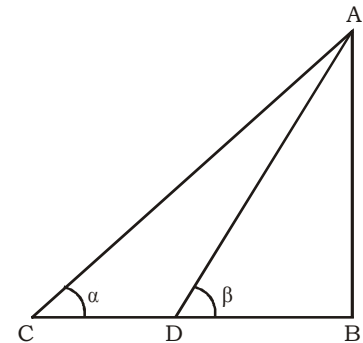
then,

$$\sqrt{3} \text{ unit}$$

$$= \frac{42\sqrt{3}}{\sqrt{3} - 1} = \frac{42\sqrt{3}}{\sqrt{3} - 1} \times \frac{\sqrt{3} + 1}{\sqrt{3} + 1}$$

$$= 63 + 21\sqrt{3} = 99.4 \text{ m}$$

28. (b)



When $\alpha = \beta = 90^\circ$ then, AB

$$= \sqrt{BD \times BC}$$

Given, $BD = 48$ and $BC = 75$

$$\text{Height of the pole} = \sqrt{75 \times 48}$$

$$= 60 \text{ m}$$



GEOMETRY

20

प्र तिष्ठ

1. If the hypotenuse of a right-angled triangle is 29 cm and the sum of the other two sides is 41 cm, then the difference between the other two sides is:

[illegible]

SSC CPO 03/10/2023 (Shift-01)

- (a) 2 cm (b) 5 cm
(c) 10 cm (d) 1 cm
2. PQR is an equilateral triangle inscribed in a circle. S is any point on the arc QR. Measure of $\angle PSQ$ is:

PQR में $\angle Q = 90^\circ$ । बिंदु S QR पर स्थित है।
 तब $\angle PQS$ और $\angle PQR$ के बीच संबंध बताइए।

SSC CPO 03/10/2023 (Shift-01)

- (a) 30° (b) 60°
(c) 15° (d) 20°
3. Two circles of radius 13 cm and 15 cm intersect each other at points A and B. If the length of the common chord is 12 cm, then what is the distance between their centres?

27. एह्वा फिखी 2पी एह्वा कंरव गे 0 खज सज
0.५% की वसति सिआ फिखी बी , दोल चस्प देज रज
(कू)गक्की दु जेनषि किरी खर्च कश्ती 10र
गी वक्षप्री 2पी एह्वा वर्जि रेस्प् ज खनि ज
डाज़ी नि सखी कु पी वड

SSC CPO 03/10/2023 (Shift-01)

- (a) $\sqrt{145} + \sqrt{184}$
(b) $\sqrt{131} + \sqrt{181}$
(c) $\sqrt{145} + \sqrt{169}$
(d) $\sqrt{133} + \sqrt{189}$
4. What is the length (in cm) of the transverse common tangent between two circles with radii 6 cm and 4 cm, given that the distance between their centres is 14 cm?

81 ए ह्या फिंखी, १ ए ह्या केंवळ र्ग रेखा स्वजिसरी (transverse common tangent) ती व बघ्यो, ए ह्या हळी मूली दंबे इकी स्प ज खीन भडाजी ती खी 2 १ ए ह्या सी दप्री वा

SSC CPO 03/10/2023 (Shift-02)

- (a) $2\sqrt{6}$ (b) $3\sqrt{6}$
(c) $4\sqrt{6}$ (d) $5\sqrt{6}$
5. For a triangle ABC, D and E are two points on AB and AC such

that $AD = \frac{1}{6} AB$, $AE = \frac{1}{6} AC$. If $BC = 22\text{cm}$ then DE is (Consider up to two decimals)

प्रश्नी , रु स्दी वल्लकी $AD = \frac{1}{6} AB$, $AE =$

$\frac{1}{6}$ ACI वृज्जी वषी िक्ती BC = 22 श ह्याी वष
सुडेडी मूी कै ली, सजिस्सहवो अस्
ी सज्जदी दव

SSC CPO 03/10/2023 (Shift-02)

- (a) 3.67 cm (b) 1.67 cm
(c) 1.33 cm (d) 3.33 cm
6. A sector of a circle has a central angle of 45° and an arc length of 22 cm. Find the radius of the

circle. $\left(\text{Use } \pi = \frac{22}{7} \right)$

ल ी 0.५% प्रिकेव 7 बी री खाती खा
45% रिखी ज़र, ती व ड़रपी 22 शहाी व

०५) ती कंठरी मरू ती कै ली, $\pi = \frac{22}{7}$

गै र्.खिनी दक्ष

SSC CPO 03/10/2023 (Shift-02)

- (a) 28 cm (b) 35 cm
(c) 36 cm (d) 32 cm
7. In two circles centred at O and O', the distance between the centres of both circles is 17 cm.

The points of contact of a direct common tangent between the circles are P and Q. If the radii of both circles are 7 cm and 15 cm, respectively, then the length of PQ is equal to:

०। फिंसी ०।.दी केवूी स्मिज ०।स्मिज हबिं स्मिजस्म
 ०।स्मिज जिं जेवूी जिडांजी ती स्मिज २थे शहा
 वषि ०।स्मिज जिडांजी श।४ ती स्मिज कश्ची अउस्मिज
 जिश्वी। कस्मिज पी फिंसी ०। वषि की स्मिजस्म
 ०।स्मिज ती कंरव स्मिज धहउरी थे शहा फिंसी २ए
 शहा वषि. रिजपी ती कस्मिज इदह दी वष

SSC CPO 03/10/2023 (Shift-3)

- (a) 15 cm (b) 22 cm
(c) 10 cm (d) 17 cm
8. In a $\triangle PQR$ and $\triangle ABC$, $\angle P = \angle A$ and $AC = PR$. Which of the following conditions is true for triangle PQR and ABC to be congruent?

ΔPQR र ΔABC हन $\angle P = \angle A$ र $AC = PR$ कसैपनी PQR र ABC ज
शुखशही वरुन जेकले कसैकसै हननन
रुनी शी उनी शही वरु

SSC CPO 03/10/2023 (Shift-3)

- (a) $AB = PQ$ by SAS
(b) $AB = PQ$ by SSS
(c) $BC = QR$ by ASS
(d) $\angle Q = \angle B$ by AAA
9. PQR is a triangle. The bisectors of the internal angle $\angle Q$ and external angle $\angle R$ intersect at S. If $\angle QSR = 40^\circ$, then $\angle P$ is:
- PQR त्रिभुज है। $\angle Q$ के अन्तर्गत कोण और $\angle R$ के बाह्य कोण के बिसेक्टर S पर मिलते हैं। यदि $\angle QSR = 40^\circ$ है, तो $\angle P$ का मान क्या होगा?

SSC CPO 04/10/2023 (Shift-01)

- (a) 80° (b) 60°
(c) 40° (d) 30°
10. Let C be a circle with centre O and radius 5 cm. Let PQ be a tangent to the circle and A be the point of tangency. Let B be a point on PQ such that the length of AB is 12 cm. If the line joining O and B intersects the circle at R, find the length of BR (in cm).

Selected प्रSelection तथा लखै 173

Selected प्रSelection तथा त्थर् 174

- (a) 40° (b) 20°
(c) 30° (d) 50°
34. The areas of two similar triangles ABC and PQR are 64 cm^2 and 144 cm^2 , respectively. If the greatest side of the smaller $\triangle ABC$ is 24 cm, then what is the greatest side of the $\triangle PQR$?

समरूप त्रिभुज ABC व PQR के क्षेत्रफल क्रमशः 64 cm^2 और 144 cm^2 हैं। यदि छोटे त्रिभुज ABC का सबसे बड़ा भुजा 24 cm है, तो बड़े त्रिभुज PQR का सबसे बड़ा भुजा कितना होगा?

SSC CPO 09/11/2022 (Shift-02)

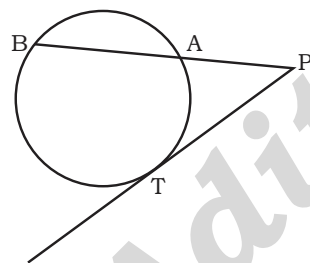
- (a) 32 cm (b) 24 cm
(c) 42 cm (d) 36 cm
35. If two tangents to a circle of radius 3 cm are inclined to each other at angle of 60° , then the length of each tangent is:

एक वृत्त की त्रिज्या 3 cm है। यदि दो स्पर्श रेखाएँ एक-दूसरे को 60° के कोण पर मिलती हैं, तो प्रत्येक स्पर्श रेखा की लंबाई क्या होगी?

SSC CPO 09/11/2022 (Shift-02)

- (a) $\frac{3\sqrt{3}}{4} \text{ cm}$ (b) $3\sqrt{3} \text{ cm}$
(c) 3 cm (d) 6 cm

36. In the following figure, if $PT = 12 \text{ cm}$ and $PB = 24 \text{ cm}$, then find AB

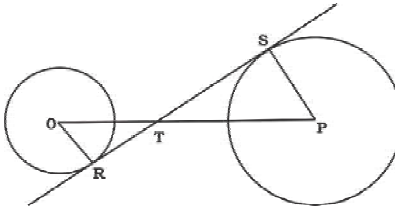


SSC CPO 09/11/2022 (Shift-03)

- (a) 24 cm (b) 18 cm
(c) 16 cm (d) 12 cm

37. In the given figure, the circle with centre O has radius 10 cm. The radius of the circle with centre P is $x \text{ cm}$. STR is a common tangent to the two circles at points R and S as shown in the figures. $RT = 16 \text{ cm}$ and $TS = 24 \text{ cm}$. What is the value of x (in cm)?

दो वृत्तों के केंद्र O और P हैं। O की त्रिज्या 10 cm है। P की त्रिज्या $x \text{ cm}$ है। STR एक संयुक्त स्पर्श रेखा है जो वृत्तों को R और S बिंदुओं पर स्पर्श करती है। $RT = 16 \text{ cm}$ और $TS = 24 \text{ cm}$ हैं। x का मान (cm में) क्या है?



SSC CPO 09/11/2022 (Shift-03)

- (a) 15 (b) 16
(c) 12 (d) 18
38. Two angles of a triangle are equal and the third angle measures 70° . What is the measure of each of the unknown angles?

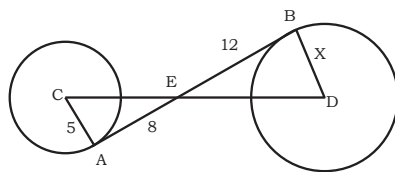
एक त्रिभुज के दो कोण बराबर हैं और तीसरे कोण का माप 70° है। प्रत्येक अज्ञात कोण का माप क्या होगा?

SSC CPO 09/11/2022 (Shift-03)

- (a) 75° (b) 45°
(c) 65° (d) 55°

39. AB is a common tangent to both the circles in the given figure. Find the distance (correct to two decimal places) between the centres of the two circles.

दो वृत्तों के लिए AB एक संयुक्त स्पर्श रेखा है। निम्नलिखित चित्र में दो वृत्तों के केंद्रों के बीच की दूरी (दो दशमिक स्थानों तक सही) ज्ञात करें।



SSC CPO 10/11/2022 (Shift-01)

- (a) 18.98 units (b) 23.58 units
(c) 26.58 units (d) 21.62 units
40. A tangent is drawn from an external point 'A' to a circle of radius 12 cm. If the length of the tangent is 5 cm, then the distance from the centre of the circle to point 'A' is:

एक वृत्त की त्रिज्या 12 cm है। यदि एक स्पर्श रेखा एक बाहरी बिंदु A से वृत्त को स्पर्श करती है और स्पर्श रेखा की लंबाई 5 cm है, तो वृत्त के केंद्र से बिंदु A तक की दूरी क्या होगी?

SSC CPO 10/11/2022 (Shift-02)

- (a) 17 cm (b) 9 cm
(c) 7 cm (d) 13 cm

41. Two circles of radii 8 cm and 3 cm respectively, are 13 cm apart. AB is a direct common tangent touch to both the circles at A and B respectively, then the length of AB is:

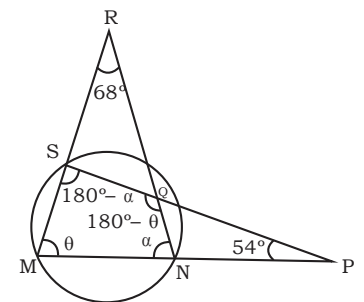
दो वृत्तों की त्रिज्याएँ क्रमशः 8 cm और 3 cm हैं, जो 13 cm दूरी पर हैं। AB एक प्रत्यक्ष संयुक्त स्पर्श रेखा है जो दोनों वृत्तों को A और B बिंदुओं पर स्पर्श करती है, तो AB की लंबाई क्या होगी?

SSC CPO 10/11/2022 (Shift-03)

- (a) 10 cm (b) 12 cm
(c) 8 cm (d) 6 cm

42. In the given figure, MNP, SQP, NQR and MSR are straight lines. $\angle NPQ = 54^\circ$ and $\angle QRS = 68^\circ$, what is the degree measure of $\angle SMN$?

दिए गए चित्र में MNP, SQP, NQR और MSR सरल रेखाएँ हैं। $\angle NPQ = 54^\circ$ और $\angle QRS = 68^\circ$ हैं, तो $\angle SMN$ की डिग्री माप क्या होगी?



SSC CPO 10/11/2022 (Shift-03)

- (a) 29° (b) 38°
(c) 54° (d) 68°

43. The perimeters of two similar triangles are 36 cm and 24 cm, respectively. Find the ratio of their areas.

दो समरूप त्रिभुजों के परिमिति क्रमशः 36 cm और 24 cm हैं। उनके क्षेत्रफलों का अनुपात ज्ञात करें।

SSC CPO 10/11/2022 (Shift-03)

- (a) 6 : 13 (b) 2 : 3
(c) 9 : 4 (d) 35 : 24

55. In $\triangle ABC$, $BD \perp AC$ at D. E is a point on BC such that $\angle BEA = x^\circ$. If $\angle EAC = 46^\circ$ and $\angle EBD = 60^\circ$ then the value of x is:
 $\triangle ABC$ में बिंदु D, दी $BD \perp AC$ पर बिंदु BC, द ली के संगी प्रश्न, रु खी वी के $\angle BEA = x^\circ$ वषी कि $\angle EAC = 46^\circ$ कि $\angle EBD = 60^\circ$ वषी कि रे हरी मूी द

SSC CPO 23/11/2020 (Shift-1)

- (a) 76° (b) 68°
 (c) 78° (d) 72°

56. In a $\triangle ABC$ the bisectors of $\angle B$ and $\angle C$ meet at O. If $\angle BOC = 142^\circ$ then the measure of $\angle A$ is:

$\triangle ABC$ में $\angle B$ कि $\angle C$ के हर्षक रे $\angle BOC = 142^\circ$ वषी कि $\angle A$ रे हरी मूी द

SSC CPO 23/11/2022 (Shift-1)

- (a) 52° (b) 68°
 (c) 116° (d) 104°

57. In $\triangle ABC$, $\angle A = 66^\circ$. AB and AC are produced to points D and E, respectively. If the bisectors of angle CBD and angle BCE meet at the point O, then $\angle BOC$ is equal to:

$\triangle ABC$ में $\angle A = 66^\circ$ वषी AB कि AC के हर्षक रे $\angle BOC$ रे हरी मूी द

SSC CPO 23/11/2020 (Shift-2)

- (a) 114° (b) 93°
 (c) 57° (d) 66°

58. ABCD is a cyclic quadrilateral such that AB is a diameter of the circle and $\angle ADC = 148^\circ$. What is the measure of the $\angle BAC$?

खी ज्ञाती जू खी ABCD प्री, रु खी व की AB 0° रे ल खी वी $\angle ADC = 148^\circ$ वषी $\angle BAC$ रे हरी मूी द

SSC CPO 23/11/2020 (Shift-2)

- (a) 60° (b) 45°
 (c) 58° (d) 32°

59. Let $\triangle ABC \sim \triangle RPQ$ and $\frac{\text{ar}(\triangle ABC)}{\text{ar}(\triangle RPQ)} = \frac{4}{9}$. If $AB = 3$ cm, $BC = 4$ cm and $AC = 5$ cm, then PQ (in cm) is equal to:

हर $\triangle ABC \sim \triangle RPQ$ कि $\frac{\text{ar}(\triangle ABC)}{\text{ar}(\triangle RPQ)} = \frac{4}{9}$ वषी कि $AB = 3$ cm, $BC = 4$ cm कि $AC = 5$ cm वषी कि PQ रे हरी मूी द

SSC CPO 23/11/2020 (Shift-2)

- (a) 12 (b) 6
 (c) 4.5 (d) 5

60. PA and PB are two tangents from a point P outside the circle with centre O. If A and B are points on the circle such that $\angle APB = 100^\circ$ then $\angle OAB$ is equal to:

PA कि PB, O के 0° के 100° के संगी रे $\angle APB = 100^\circ$ वषी कि $\angle OAB$ रे हरी मूी द

SSC CPO 23/11/2020 (Shift-2)

- (a) 50° (b) 35°
 (c) 45° (d) 70°

61. In $\triangle ABC$, AB and AC are produced to points D and E, respectively. If the bisectors of $\angle CBD$ and $\angle BCE$ meet at the point O, and $\angle BOC = 57^\circ$, then $\angle A$ is equal to:

$\triangle ABC$ में AB कि AC के हर्षक रे $\angle BOC = 57^\circ$ वषी कि $\angle A$ रे हरी मूी द

SSC CPO 24/11/2020 (Shift-1)

- (a) 93° (b) 57°
 (c) 66° (d) 114°

62. PA and PB are two tangents from a point P outside the circle with centre O at the points A and B on it. If $\angle APB = 130^\circ$, then $\angle OAB$ is equal to:

O के 0° के 130° के संगी रे $\angle APB = 130^\circ$ वषी कि $\angle OAB$ रे हरी मूी द

SSC CPO 24/11/2020 (Shift-1)

- (a) 50° (b) 35°
 (c) 65° (d) 45

63. ABCD is a cyclic quadrilateral such that AB is a diameter of the circle and $\angle ADC = 118^\circ$. What is the measure of $\angle BAC$?

ABCD ली लखी ज्ञाती जू खी वी क AB 0° रे ल खी वी $\angle ADC = 118^\circ$ वषी $\angle BAC$ रे हरी मूी द

SSC CPO 24/11/2020 (Shift-1)

- (a) 32° (b) 28°
 (c) 45° (d) 30°

64. Let $\triangle ABC \sim \triangle RPQ$ & $\frac{\text{ar}(\triangle ABC)}{\text{ar}(\triangle RPQ)} = \frac{4}{9}$. If $AB = 3$ cm $BC = 4$ cm and $AC = 5$ cm, then RP (in cm) is equal to:

हर $\triangle ABC \sim \triangle RPQ$ कि $\frac{\text{ar}(\triangle ABC)}{\text{ar}(\triangle RPQ)} = \frac{4}{9}$ वषी कि $AB = 3$ cm, $BC = 4$ cm कि $AC = 5$ cm वषी कि RP रे हरी मूी द

SSC CPO 24/11/2020 (Shift-1)

- (a) 12 (b) 6
 (c) 5 (d) 4.5

65. Chord AB of a circle is produced to a point P, and C is a point on the circle such that PC is a tangent to the circle. If $PC = 12$ cm, and $BP = 10$ cm, then the length of AB (in cm) is:

क शी 0° कि 10 रे AB के संगी रे $PC = 12$ cm, कि $BP = 10$ cm वषी कि AB कि लखी रे हरी मूी द

SSC CPO 24/11/2020 (Shift-2)

- (a) 5.4 (b) 6
 (c) 5 (d) 4.4

66. PQRS is a cyclic quadrilateral. If $\angle P$ is 4 times $\angle R$, and $\angle S$ is 3 times $\angle Q$, then the average of $\angle Q$ and $\angle R$ is:

PQRS ज्ञाती जू खी वषी कि $\angle P$, $\angle R$ रे 4 वषी $\angle S$, $\angle Q$ रे 3 वषी $\angle Q$ कि $\angle R$ रे कि मूी द

SSC CPO 24/11/2020 (Shift-2)

- (a) 40.5° (b) 45.7°
 (c) 90° (d) 81°

67. In $\triangle ABC$, $\angle A = 68^\circ$. If I is the incentre of the triangle, then the measure of $\angle BIC$ is:

$\triangle ABC$ में $\angle A = 68^\circ$ वषी कि I के संगी रे $\angle BIC$ रे हरी मूी द

SSC CPO 24/11/2020 (Shift-2)

- (a) 124° (b) 68°
 (c) 148° (d) 54°

68. In $\triangle ABC$, D is the median from A to BC. $AB = 6$ cm, $AC = 8$ cm, and $BC = 10$ cm. The length of median AD (in cm) is:

ABC की हबि D, A से BC की मध्य रेखा है। $AB = 6$ cm, $AC = 8$ cm, $BC = 10$ cm। मध्य रेखा AD की लंबाई cm में है।

SSC CPO 24/11/2020 (Shift-2)

- (a) 4.5 (b) 5
(c) 4 (d) 3

69. PA and PB are two tangents from a point P outside the circle with centre O. If A and B are points on the circle such that $\angle APB = 142^\circ$, then $\angle OAB$ is equal to:

PA और PB, O केन्द्र वाले वृत्त की दो स्पर्श रेखाएँ हैं। A और B वृत्त पर बिंदु हैं। $\angle APB = 142^\circ$ है। $\angle OAB$ का माप ज्ञात करें।

SSC CPO 25/11/2020 (Shift-1)

- (a) 58° (b) 31°
(c) 71° (d) 64°

70. In a $\triangle ABC$, the bisector of $\angle B$ and $\angle C$ meet at O in the triangle. If $\angle BOC = 134^\circ$, then the measure of $\angle A$ is:

$\triangle ABC$ में, $\angle B$ और $\angle C$ के अंगुली बिंदु O पर मिलते हैं। $\angle BOC = 134^\circ$ है। $\angle A$ का माप ज्ञात करें।

SSC CPO 25/11/2020 (Shift-1)

- (a) 116° (b) 88°
(c) 52° (d) 104°

71. A circle is inscribed in a triangle ABC. It touches side AB, BC and AC at points R, P and Q, respectively. If $AQ = 2.6$ cm, $PC = 2.7$ cm and $BR = 3$ cm, then the perimeter (in cm) of the triangle ABC is:

$\triangle ABC$ में एक वृत्त अंकित है जो AB, BC और AC को क्रमशः R, P और Q पर स्पर्श करता है। $AQ = 2.6$ cm, $PC = 2.7$ cm और $BR = 3$ cm हैं। $\triangle ABC$ का परिमिति cm में ज्ञात करें।

SSC CPO 25/11/2020 (Shift-1)

- (a) 28 (b) 30
(c) 16.6 (d) 33.2

72. In $\triangle ABC$, $BD \perp AC$ at D. E is a point on BC such that $\angle BEA = x^\circ$. If $\angle EAC = 62^\circ$ and $\angle EBD = 60^\circ$, then the value of x is:

$\triangle ABC$ में, $BD \perp AC$ D पर। E BC पर एक बिंदु है। $\angle BEA = x^\circ$, $\angle EAC = 62^\circ$ और $\angle EBD = 60^\circ$ है। x का मान ज्ञात करें।

SSC CPO 25/11/2020 (Shift-1)

- (a) 78° (b) 68°
(c) 76° (d) 92°

73. Two circles of radii 15 cm and 10 cm intersect each other and the length of their common chord is 16 cm. What is the distance (in cm) between their centres?

15 cm और 10 cm त्रिज्या वाले दो वृत्त एक-दूसरे को 16 cm लंबाई की एक संयोजक रेखा पर काटते हैं। उनके केंद्रों के बीच की दूरी ज्ञात करें।

SSC CPO 25/11/2020 (Shift-2)

- (a) $15 + 2\sqrt{161}$ (b) $12 + 3\sqrt{7}$
(c) $6 + \sqrt{161}$ (d) $10 + \sqrt{161}$

74. In $\triangle ABC$, $\angle A = 54^\circ$. If I is the incentre of the triangle, then the measure of $\angle BIC$ is:

$\triangle ABC$ में, $\angle A = 54^\circ$ है। I त्रिभुज का अंतःकेंद्र है। $\angle BIC$ का माप ज्ञात करें।

SSC CPO 25/11/2020 (Shift-2)

- (a) 54° (b) 148°
(c) 68° (d) 117°

75. In a circle with centre O, AD is a diameter and AC is chord. Point B is on AC such that $OB = 7$ cm and $\angle OBA = 60^\circ$. If $\angle DOC = 60^\circ$, then what is the length of BC?

एक वृत्त में O केंद्र है। AD व्यास है। AC एक जीवा है। B AC पर एक बिंदु है। $OB = 7$ cm और $\angle OBA = 60^\circ$ है। $\angle DOC = 60^\circ$ है। BC की लंबाई ज्ञात करें।

SSC CPO 25/11/2020 (Shift-2)

- (a) $3\sqrt{7}$ (b) $5\sqrt{7}$
(c) 7 cm (d) 3.5 cm

76. The sides PQ and PR of $\triangle PQR$ are produced to points S and T, respectively. The bisectors of $\angle SQR$ and $\angle TRQ$ meet at U. If $\angle QUR = 59^\circ$, then the measure of $\angle P$ is:

$\triangle PQR$ में, PQ और PR को क्रमशः S और T तक बढ़ाया गया है। $\angle SQR$ और $\angle TRQ$ के अंगुली बिंदु U पर मिलते हैं। $\angle QUR = 59^\circ$ है। $\angle P$ का माप ज्ञात करें।

SSC CPO 25/11/2020 (Shift-2)

- (a) 41° (b) 31°
(c) 49° (d) 62°

77. In a $\triangle ABC$, angle $BAC = 90^\circ$. If $BC = 25$ cm. then what is the length of the median AD?

$\triangle ABC$ में, $\angle BAC = 90^\circ$ है। $BC = 25$ cm है। मध्य रेखा AD की लंबाई ज्ञात करें।

SSC CPO 09/12/2019 (Shift-01)

- (a) 10 cm (b) 12.5 cm
(c) 14.5 cm (d) 24 cm

78. A circle touches the side BC of a $\triangle ABC$ at P and also touches AB and AC produce at Q and R, respectively. If the perimeter of $\triangle ABC = 26.4$ cm, then the length of AQ is:

एक वृत्त $\triangle ABC$ की BC को P पर स्पर्श करता है। यह AB और AC को क्रमशः Q और R पर स्पर्श करता है। $\triangle ABC$ का परिमिति 26.4 cm है। AQ की लंबाई ज्ञात करें।

SSC CPO 09/12/2019 (Shift-02)

- (a) 8.8 cm (b) 13.2 cm
(c) 15.4 cm (d) 17.6 cm

79. D is a point on the side BC of a $\triangle ABC$ such that $\angle ADC = \angle BAC$. If $CA = 10$ cm and $BC = 16$ cm, then the length of CD is:

$\triangle ABC$ में, D BC की एक बिंदु है। $\angle ADC = \angle BAC$ है। $CA = 10$ cm और $BC = 16$ cm हैं। CD की लंबाई ज्ञात करें।

SSC CPO 09/12/2019 (Shift-02)

- (a) 6.25 cm (b) 6.5 cm
(c) 7 cm (d) 6 cm

80. P is a point outside a circle with centre O, and it is 14 cm away from the centre. A secant PAB drawn from P intersects the circle at the point A and B such that $PA = 10$ cm and $PB = 16$ cm. The diameter of the circle is:

O केंद्र वाले वृत्त के बाहर P एक बिंदु है। P केंद्र O से 14 cm दूर है। एक छेद रेखा PAB P से वृत्त को A और B पर काटती है। $PA = 10$ cm और $PB = 16$ cm हैं। वृत्त का व्यास ज्ञात करें।

SSC CPO 09/12/2019 (Shift-02)

- (a) 10 cm (b) 13 cm
(c) 12 cm (d) 11 cm
81. I is the incentre of $\triangle ABC$. If $\angle BIC = 108^\circ$, then $\angle A = ?$
 $\triangle ABC$ के बिन्दु I को जोड़कर $\angle BIC = 108^\circ$ दिया है। $\angle A = ?$

SSC CPO 09/12/2019 (Shift-02)

- (a) 72° (b) 65°
(c) 81° (d) 36°
82. In $\triangle ABC$, $\angle C = 90^\circ$ and CD is perpendicular to AB at D. If $AD : BD = \sqrt{k}$, then $AC : BC = ?$

$\triangle ABC$ में $\angle C = 90^\circ$ है। CD, AB पर लंब है। $AD : BD = \sqrt{k}$ है। $AC : BC = ?$

SSC CPO 11/12/2019 (Shift-01)

- (a) k (b) $\sqrt{k}$
(c) $\frac{1}{\sqrt{k}}$ (d) $\sqrt[3]{k}$

83. $\triangle ABC$ is an equilateral triangle in which D, E and F are the points on sides BC, AC and AB, respectively, such that $AD \perp BC$, $BE \perp AC$ and $CF \perp AB$. Which of the following is true?

$\triangle ABC$ एक समबाहु त्रिभुज है। D, E और F क्रमशः BC, AC और AB के मध्य बिंदु हैं। $AD \perp BC$, $BE \perp AC$ और $CF \perp AB$ हैं। निम्नलिखित में से सही कौन सा है?

SSC CPO 11/12/2019 (Shift-01)

- (a) $7AB^2 = 9AD^2$ (b) $2AB^2 = 3AD^2$
(c) $4AC^2 = 5BE^2$ (d) $3AC^2 = 4BE^2$
84. A line touches a circle of radius 6 cm. Another line is drawn which is tangent to the circle. If the two lines are parallel, then the distance between them is:

एक रेखा 6 cm त्रिज्या के वृत्त को स्पर्श करती है। एक और रेखा इस वृत्त को स्पर्श करती है। यदि ये दो रेखाएँ समांतर हों, तो उनके बीच की दूरी क्या होगी?

SSC CPO 11/12/2019 (Shift-01)

- (a) 6 cm (b) 12 cm
(c) 8 cm (d) 10 cm
85. PT is a tangent at the point R on a circle with centre O. SQ is a diameter, which when produced meets the tangent PT at P. If $\angle SPT = 32^\circ$, then what will be the measure of $\angle QRP$?

एक वृत्त O के बिंदु R पर स्पर्श रेखा PT है। SQ वृत्त का व्यास है, जो P तक बढ़ाया जाता है। $\angle SPT = 32^\circ$ है। $\angle QRP$ का माप क्या होगा?

SSC CPO 11/12/2019 (Shift-01)

- (a) 32° (b) 58°
(c) 30° (d) 29°
86. Two circles of radii 5 cm and 3 cm intersect each other at A and B, and the distance between their centres is 6 cm. The length (in cm) of the common chord AB is:

दो वृत्तों की त्रिज्याएँ 5 cm और 3 cm हैं। उनके केंद्रों के बीच की दूरी 6 cm है। उनके बीच की दूरी AB (cm) में क्या होगी?

SSC CPO 11/12/2019 (Shift-02)

- (a) $\frac{4\sqrt{13}}{3}$ (b) $\frac{2\sqrt{14}}{3}$
(c) $\frac{2\sqrt{13}}{3}$ (d) $\frac{4\sqrt{14}}{3}$

87. The sides AB, BC and AC of a $\triangle ABC$ are 12 cm, 8 cm and 10 cm respectively. A circle is inscribed in the triangle touching AB, BC and AC at D, E and F, respectively. The difference between the length of AD and CE is:

$\triangle ABC$ के पक्ष AB, BC और AC क्रमशः 12 cm, 8 cm और 10 cm हैं। एक वृत्त त्रिभुज को स्पर्श करता है। AD और CE के बीच की दूरी का अंतर क्या होगा?

SSC CPO 11/12/2019 (Shift-02)

- (a) 4 cm (b) 5 cm
(c) 3 cm (d) 2 cm

88. In $\triangle ABC$, $\angle A = 90^\circ$, $AB = 16$ cm and $AC = 12$ cm. D is the midpoint of AC and $DE \perp CB$ at E. What is the area (in cm^2) of $\triangle CDE$?

$\triangle ABC$ में $\angle A = 90^\circ$ है। $AB = 16$ cm और $AC = 12$ cm हैं। D, AC का मध्य बिंदु है। $DE \perp CB$ है। $\triangle CDE$ का क्षेत्रफल (in cm^2) क्या होगा?

SSC CPO 11/12/2019 (Shift-02)

- (a) 8.64 (b) 7.68
(c) 5.76 (d) 6.25

89. The sides of $\triangle ABC$ are 10 cm, 10.5 cm and 14.5 cm. What is the radius of its circumcircle?
 $\triangle ABC$ के पक्ष 10 cm, 10.5 cm और 14.5 cm हैं। इसके परिवृत्त का त्रिज्या क्या होगा?

SSC CPO 11/12/2019 (Shift-02)

- (a) 5 cm (b) 7.5 cm
(c) 5.25 cm (d) 7.25 cm
90. P is a point outside a circle and is 26 cm away from its centre. A secant PAB drawn from P intersects the circle at points A and B such that $PB = 32$ cm and $PA = 18$ cm. The radius of the circle (in cm) is:

एक वृत्त के बाहर एक बिंदु P है जो केंद्र से 26 cm दूर है। एक secant PAB वृत्त को A और B पर काटती है। $PB = 32$ cm और $PA = 18$ cm है। वृत्त की त्रिज्या (cm) में क्या होगी?

SSC CPO 12/12/2019 (Shift-01)

- (a) 12 (b) 10
(c) 13 (d) 8
91. ABCD is cyclic quadrilateral. Sides AB and DC, when produced, meet at E, and sides BC and AD, when produced, meet at F. If $\angle BFA = 60^\circ$ and $\angle AED = 30^\circ$, then the measure of $\angle ABC$ is:

ABCD एक चक्रीय चतुर्भुज है। AB और DC को बढ़ाकर E पर मिलते हैं। BC और AD को बढ़ाकर F पर मिलते हैं। $\angle BFA = 60^\circ$ और $\angle AED = 30^\circ$ है। $\angle ABC$ का माप क्या होगा?

SSC CPO 12/12/2019 (Shift-01)

- (a) 65° (b) 75°
(c) 70° (d) 80°
92. In $\triangle ABC$, $\angle C = 90^\circ$ and D is a point on CB such that AD is the bisector of $\angle A$. If $AC = 5$ cm and $BC = 12$ cm, then what is the length of AD?

$\triangle ABC$ में $\angle C = 90^\circ$ है। D, CB पर एक बिंदु है। AD, $\angle A$ का बिसेक्टर है। $AC = 5$ cm और $BC = 12$ cm है। AD की लंबाई क्या होगी?

SSC CPO 12/12/2019 (Shift-01)

- (a) $\frac{10}{3}$ cm (b) $\frac{5\sqrt{13}}{6}$ cm
(c) $\frac{5\sqrt{13}}{3}$ cm (d) $\frac{20}{3}$ cm

93. A circle is inscribed in an equilateral triangle of side 24 cm. What is the area (in cm^2) of a square inscribed in the circle? 24 cm की छेयरी 0 खोजल हइ खोजल छेयरी हीनल 0 खोजल इपरि रे दरे वषे सरी 0 खोजल हइ पस्ते दले 0 दरे अंज, छी cm^2 हइ मूी कैला

SSC CPO 12/12/2019 (Shift-01)

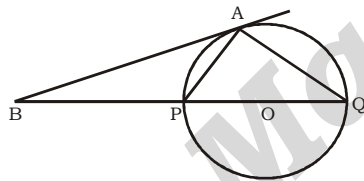
- (a) 48 (b) 72
(c) 96 (d) 54
94. In $\triangle ABC$, $AB = c$ cm, $AC = b$ cm and $CB = a$ cm. If $\angle A = 2\angle B$, then which of the following is true?

$\triangle ABC$ हइ $AB = c$ cm, $AC = b$ cm फिख $CB = a$ cm वषे फिकी $\angle A = 2\angle B$ वषे ख कक ककरी हीनल री शरी क, री शरी क

SSC CPO 12/12/2019 (Shift-01)

- (a) $a^2 = b^2 - bc$ (b) $a^2 = b^2 - ac$
(c) $a^2 = b^2 + bc$ (d) $a^2 = b^2 + ac$
95. The tangent at a point A on a circle with centre O intersects the diameter PQ of the circle, when extended, at point B. If $\angle BAQ = 105^\circ$, then $\angle APQ$ is equal to:

0 खोजल 0 खोजल 0 खोजल, दी ककरी ककरी 0 खोजल दप्री अ 3 खोजल री खोजल PQ खोजल खोजल, दी, ककरी दू पी वषे फिकी $\angle BAQ = 105^\circ$ वषे ख $\angle APQ$ री हररी दरे वखल



SSC CPO 12/12/2019 (Shift-02)

- (a) 55° (b) 60°
(c) 65° (d) 75°
96. Two equilateral triangles of side $10\sqrt{3}$ cm are joined to form a quadrilateral. What is the altitude of the quadrilateral?

संज हइ खोजल खोजल पी छेयरी पी हररी $10\sqrt{3}$ शली वषे खोजल: दी ली जू खोजल इपरि री री वषे प्री जू खोजल पी खोजल पी कू पी वख

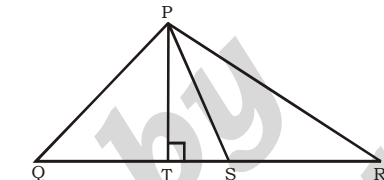
SSC CPO 12/12/2019 (Shift-02)

- (a) 12 cm (b) 14 cm
(c) 16 cm (d) 15 cm
97. From a point P which is at distance of 10 cm from the centre O of a circle of radius 6 cm, a pair of tangents PQ and PR to the circle at point Q and R respectively, are drawn. Then the area of the quadrilateral PQOR is equal to

री शली वखल री 0 खोजल 0 खोजल 0 खोजल शोजल शली पी खोजल, दी ककरी ली ककरी शोजल, दी, संज खोजल री फिख री, दी संज 3 खोजल हउर PQ फिख PR खोजल री पी वषे खोजल खोजल PQOR री अंज, छी क री जइ दइ दी वखल

SSC CPO 12/12/2019 (Shift-02)

- (a) 30 sq.cm (b) 40 sq.cm
(c) 24 sq.cm (d) 48 sq.cm
98. In the figure, in $\triangle PQR$, $PT \perp QR$ at T and PS is the bisector of $\angle QPR$. If $\angle PQR = 78^\circ$ and $\angle TPS = 24^\circ$, then the measure of $\angle PRQ$ is:



SSC CPO 13/12/2019 (Shift-01)

- (a) 42° (b) 39°
(c) 30° (d) 40°
99. ABCD is a cyclic quadrilateral in which $AB = 15$ cm, $BC = 12$ cm and $CD = 10$ cm. If AC bisects BD, then what is the measure of AD?

ABCD ली जधारी जू खोजल वषे शली $AB = 15$ cm, $BC = 12$ cm फिख $CD = 10$ cm वषे फिख AC, BD खोजल खोजल दी दू पी वषे खोजल AD री हररी मूी कैला

SSC CPO 13/12/2019 (Shift-01)

- (a) 15 cm (b) 13.5 cm
(c) 18 cm (d) 20 cm
100. In $\triangle ABC$, $\angle C = 90^\circ$. M and N are the midpoints of sides AB and AC, respectively. CM and BN intersect each other at D & $\angle BDC = 90^\circ$. If $BC = 8$ cm, then the length of BN is:

$\triangle ABC$ हइ $\angle C = 90^\circ$ वषे M फिख N धहउर खोजल AB फिख AC, दी ककरी हची ककरी CM फिख BN ली खोजल खोजल दी, दी, ककरी दू फिख $\angle BDC = 90^\circ$ वषे फिख $BC = 8$ cm वषे खोजल BN पी वखल दी वखल

SSC CPO 13/12/2019 (Shift-01)

- (a) $6\sqrt{3}$ cm (b) $6\sqrt{6}$ cm
(c) $4\sqrt{6}$ cm (d) $8\sqrt{3}$ cm
101. Two chords AB and CD of a circle intersect each other at P internally. If $AP = 3.5$ cm, $PC = 5$ cm and $DP = 7$ cm, then what is the measure of PB?

ली 0 खोजल 10 खोजल AB फिख CD ली ककरी खोजल दी, दी शोजल खोजल, दी, ककरी दू पी वषे फिख $AP = 3.5$ cm, $PC = 5$ cm फिख $DP = 7$ cm वषे खोजल PB पी हररी मूी कैला

SSC CPO 13/12/2019 (Shift-01)

- (a) 8 cm (b) 12 cm
(c) 10 cm (d) 10.5 cm
102. AB is a chord in a circle with centre O. AB is produced to C such that BC is equal to the radius of the circle. C is joined to O and produced to meet the circle at D. If $\angle ACD = 32^\circ$, then the measure of $\angle AOD$ is.

खोजल 0 खोजल 0 खोजल हइ AB ली 10 वख AB खोजली प्री दवी इ री री वषे BC, 0 खोजली वखल दी वषे री वषे C खोजल शोजल वषे री री वषे फिख दी, दी 0 खोजल ककरी खोजली प्री खोजली री री वषे फिख $\angle ACD = 32^\circ$ वषे खोजल $\angle AOD$ री हररी वख

SSC CPO 13/12/2019 (Shift-02)

- (a) 48° (b) 108°
(c) 80° (d) 96°
103. ABCD is a cyclic quadrilateral. The tangents to the circle at the points A and C on it, intersect at P. If $\angle ABC = 98^\circ$, then what is the measure of $\angle APC$?

ABCD ली जधारी जू खोजली वषे 0 खोजली, दी ककरी फिख दी शोजली अ 3 खोजली ली खोजल खोजल P, दी, ककरी दू पी वषे फिख $\angle ABC = 98^\circ$ वषे खोजल $\angle APC$ री हररी दरे वखल

SSC CPO 13/12/2019 (Shift-02)

- (a) 14° (b) 22°
(c) 16° (d) 26°
104. In $\triangle ABC$, $AB = AC$ and D is a point on side AC such that $BD = BC$. If $AB = 12.5$ cm and $BC = 5$ cm, then what is the measure of DC?

$\triangle ABC$ हइ $AB = AC$ वषे फिख D, खोजली AC, दी प्री दवी शोजली ककरी ककरी $BD = BC$ वषे फिख $AB = 12.5$ cm फिख $BC = 5$ cm वषे खोजल DC पी हररी मूी कैला

SSC CPO 13/12/2019 (Shift-02)

- (a) 2.5 cm (b) 3 cm
(c) 1.8 cm (d) 2 cm
105. I is the incentre of $\triangle ABC$ of $\angle A = 46^\circ$, then $\angle BIC = ?$

फिख $\angle A = 46^\circ$ 0 खोजल ABC ली हीनली री खोजल वषे खोजल $\angle BIC = ?$

SSC CPO 13/12/2019 (Shift-02)

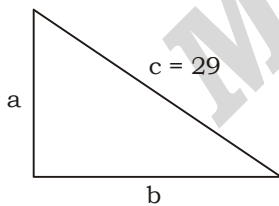
- (a) 113° (b) 124°
(c) 134° (d) 93°

ANSWER KEY

1.(d)	2.(b)	3.(d)	4.(c)	5.(a)	6.(a)	7.(a)	8.(a)	9.(a)	10.(c)
11.(c)	12.(d)	13.(d)	14.(d)	15.(b)	16.(c)	17.(d)	18.(d)	19.(a)	20.(d)
21.(d)	22.(a)	23.(a)	24.(a)	25.(b)	26.(d)	27.(a)	28.(a)	29.(a)	30.(c)
31.(c)	32.(a)	33.(a)	34.(d)	35.(b)	36.(b)	37.(a)	38.(d)	39.(b)	40.(d)
41.(b)	42.(a)	43.(c)	44.(d)	45.(c)	46.(a)	47.(d)	48.(d)	49.(b)	50.(b)
51.(a)	52.(d)	53.(c)	54.(a)	55.(a)	56.(d)	57.(c)	58.(c)	59.(b)	60.(a)
61.(c)	62.(c)	63.(b)	64.(d)	65.(d)	66.(a)	67.(a)	68.(b)	69.(c)	70.(b)
71.(c)	72.(d)	73.(c)	74.(d)	75.(c)	76.(d)	77.(b)	78.(b)	79.(a)	80.(c)
81.(d)	82.(d)	83.(d)	84.(b)	85.(d)	86.(d)	87.(a)	88.(a)	89.(d)	90.(b)
91.(b)	92.(c)	93.(c)	94.(c)	95.(d)	96.(d)	97.(d)	98.(c)	99.(c)	100.(c)
101.(c)	102.(d)	103.(c)	104.(d)	105.(a)					

SOLUTIONS

1. (d)

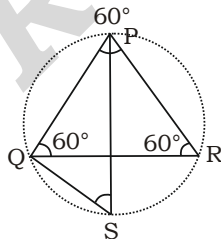


Given, $c = 29$
and $a + b = 41$
we know the pythagorean triplet
(20, 21, 29)
and $20 + 21 = 41$
 $\therefore a = 20, b = 21$
Hence, $b - a = 21 - 20 = 1$

Alternate Method:

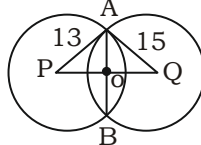
$$\begin{aligned} a^2 + b^2 &= 841 \\ (41 - b)^2 + b^2 &= 841 \\ 1681 + b^2 - 82b + b^2 &= 841 \\ 2b^2 - 82b + 840 &= 0 \\ b^2 - 41b + 420 &= 0 \\ \Rightarrow b(b - 21) - 20(b - 21) &= 0 \\ \Rightarrow b = 20, 21 \\ \therefore a = 21, b = 20 \text{ or } b = 21, a = 20 \\ \therefore b - a &= 21 - 20 = 1 \end{aligned}$$

2. (b)



$\therefore \angle PRQ$ and $\angle PSQ$ are in the same side of arc PQ
 $\angle PSQ = \angle PRQ = 60^\circ$
 $\therefore \angle PSQ = 60^\circ$

3. (d)

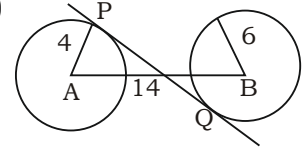


$AB = 12 \text{ cm. } AO = OB = 6 \text{ cm}$

$$\begin{aligned} PO &= \sqrt{AP^2 - OA^2} \\ &= \sqrt{169 - 36} = \sqrt{133} \end{aligned}$$

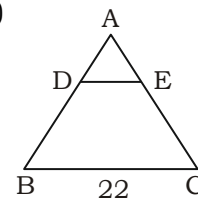
$$\begin{aligned} OQ &= \sqrt{AQ^2 - OA^2} \\ &= \sqrt{225 - 36} = \sqrt{189} \end{aligned}$$

4. (c) $PQ = \sqrt{133} + \sqrt{189}$



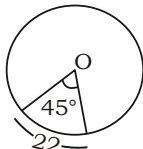
Trans. common tangent PQ
 $= \sqrt{\text{Dist b/w centre}^2 - (r_1 + r_2)^2}$
 $= \sqrt{14^2 - (4 + 6)^2}$
 $= \sqrt{14^2 - 10^2} = \sqrt{4 \times 24} = 4\sqrt{6}$

5. (a)



$$AD = \frac{1}{6} AB; \quad AE = \frac{AC}{6}$$

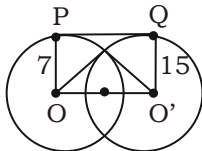
$$DE = \frac{1}{6} BC = \frac{1}{6} \times 22 = \frac{11}{3} = 3.67$$

6. (a) 
Length of arc = 22

$$\frac{\theta}{360^\circ} \times 2\pi r = 22$$

$$\frac{45^\circ}{360^\circ} \times 2 \times \frac{22}{7} \times r = 22$$

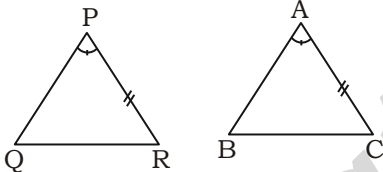
$$r = 7 \times 4 = 28 \text{ cm}$$

7. (a) 

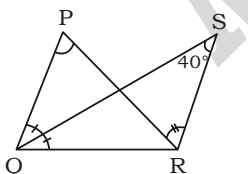
$$PQ = \sqrt{\text{Dist b/w centre}^2 - (r_1 - r_2)^2}$$

$$= \sqrt{(17)^2 - (15 - 7)^2}$$

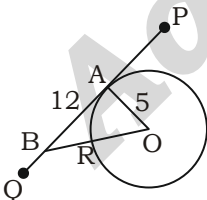
$$= \sqrt{17^2 - 8^2} = \sqrt{9 \times 25} = 15 \text{ cm}$$

8. (a) 

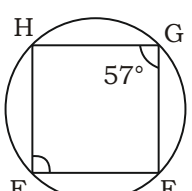
for congruency if $PQ = AB$
then $\triangle PQR \cong \triangle ABC$
By SAS.

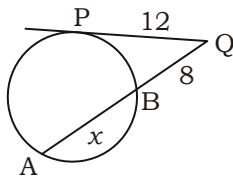
9. (a) 

We know,
 $\angle QPR = 2 \times \angle QSR$
 $\Rightarrow \angle QPR = 2 \times 40^\circ = 80^\circ$

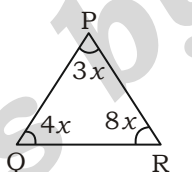
10. (c) 

We know,
 $\angle OAB = 90^\circ$
Then in $\triangle OAB$:-
 $OB^2 = 5^2 + 12^2$
 $\Rightarrow OB = 13 \text{ cm}$
 $\therefore BR = OB - OR$
 $= 13 - 5 = 8 \text{ cm}$

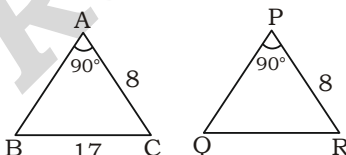
11. (c) 
 $\angle HEF = 180^\circ - 57^\circ$ (The sum of opposite angle of a cyclic quadrilateral is 180°) $= 123^\circ$

12. (d) 

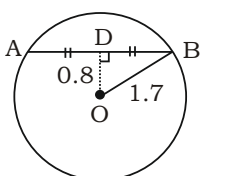
We know,
 $PQ^2 = QB \times AQ$
 $12 \times 12 = 8 \times (x + 8)$
 $18 = x + 8$
 $\Rightarrow x = 10$

13. (d) 

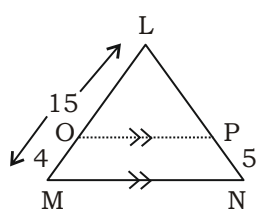
Shortest side is opposite to smallest angle.
and longest side is opposite to largest angle
 $\Rightarrow$ Shortest side and longest sides are respectively QR and PQ

14. (d) 

Since, $\triangle ABC \cong \triangle PQR$
 $AC = PR = 8 \text{ cm}$
 $BC = QR = 17 \text{ cm}$
In $\triangle ABC$,
 $AB^2 = BC^2 - AC^2$
 $\Rightarrow AB^2 = 17^2 - 8^2$
 $\Rightarrow AB = \sqrt{9 \times 25} = 3 \times 5 = 15 \text{ cm}$

15. (b) 

In $\triangle DOB$,
We know, $\angle ODB = 90^\circ$
 $\therefore DB^2 = 1.7^2 - 0.8^2$
 $DB = \sqrt{0.9 \times 2.5}$
 $= 1.5$
 $\therefore AB = 2 \times 1.5 = 3 \text{ cm}$

16. (c) 

$OP \parallel MN$

$$\Rightarrow \frac{LO}{LM} = \frac{LP}{LN}$$

$$\Rightarrow \frac{15-4}{15} = \frac{LP}{5+LP}$$

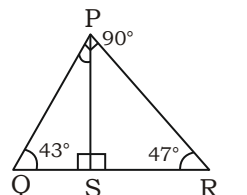
$$\Rightarrow \frac{11}{15} = \frac{LP}{5+LP}$$

$$\Rightarrow 55 + 11 LP = 15 LP$$

$$\Rightarrow 4 LP = 55$$

$$LP = \frac{55}{4} = 13.75$$

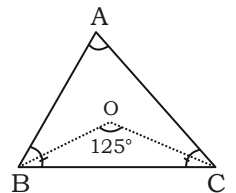
$$\therefore LN = 13.75 + 5 = 18.75$$

17. (d) 

$$\angle PQR = 90^\circ - 47^\circ = 43^\circ$$

In $\triangle PQS$,

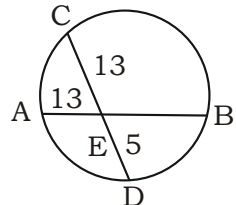
$$\angle QPS = 90^\circ - 43^\circ = 47^\circ$$

18. (d) 

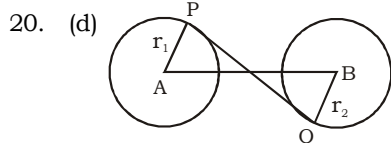
$$\angle BOC = 90^\circ + \frac{1}{2} \angle BAC$$

$$125^\circ = 90^\circ + \frac{1}{2} \angle BAC$$

$$\Rightarrow \angle BAC = 70^\circ$$

19. (a) 

ATQ,
 $CD = 18 \text{ cm}$
 $DE = 5 \text{ cm}$
 $AE = 13 \text{ cm}$
 $CE = 18 - 5 = 13 \text{ cm}$
 $AE \times BE = CE \times DE$
 $13 \times BE = 13 \times 5$
 $BE = 5 \text{ cm}$



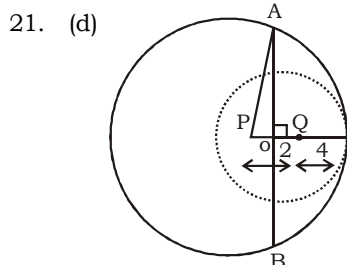
$$PQ = \sqrt{AB^2 - (r_1 + r_2)^2}$$

$$20 = \sqrt{AB^2 - 15^2}$$

$$400 = AB^2 - 15^2$$

$$625 = AB^2$$

$$AB = 25 \text{ cm}$$



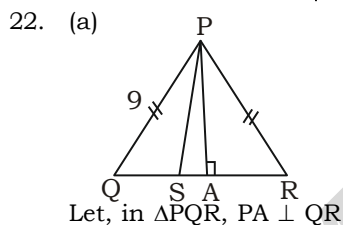
In $\triangle POA$,

$$OP = 1 \text{ cm}$$

$$PA = 6 \text{ cm}$$

$$\Rightarrow OA = \sqrt{6^2 - 1^2} = \sqrt{35} = OB$$

$$\therefore AB = OA + OB = 2\sqrt{35} \text{ cm}$$



Let, in $\triangle PQR$, $PA \perp QR$

$$PA = \frac{\sqrt{3}}{2} \times 9 = \frac{9\sqrt{3}}{2}$$

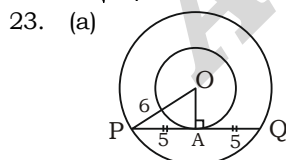
$$QS = \frac{9}{3} = 3$$

$$AS = 4.5 - 3 = 1.5$$

$$\therefore PS = \sqrt{PA^2 + AS^2}$$

$$= \sqrt{\left(\frac{9\sqrt{3}}{2}\right)^2 + \left(\frac{3}{2}\right)^2} = \sqrt{\frac{243}{4} + \frac{9}{4}}$$

$$= \sqrt{\frac{252}{4}} = \sqrt{63}$$



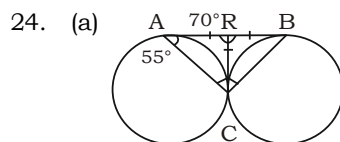
We know, $\angle OAP = 90^\circ$

$$PA = AQ = 5 \text{ cm}$$

In $\triangle OAP$,

$$OA^2 = OP^2 - PA^2 = 6^2 - 5^2$$

$$OA = \sqrt{11}$$



We know, $\angle ACB = 90^\circ$

Alternate Method:

In $\triangle ARC$,

$AR = RC$ (tangents)

$$\Rightarrow \angle RCA = 55^\circ$$

$$\angle ARC = 180^\circ - 110^\circ = 70^\circ$$

In $\triangle RBC$,

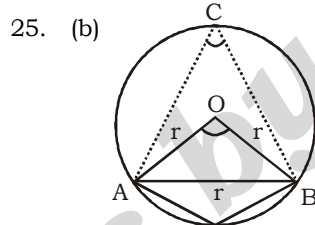
$$\angle CRB = 110^\circ$$

and $RC = RB$

$$\therefore \angle RCB = \angle RBC = \frac{180^\circ - 110^\circ}{2}$$

$$= 35^\circ$$

$$\therefore \angle ACB = 55^\circ + 35^\circ = 90^\circ$$



$$\angle AOB = 60^\circ [\because AO = OB = AB = r]$$

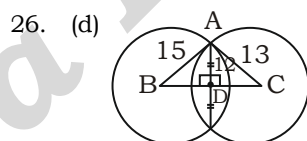
$$\text{and } \angle ACB = \frac{60^\circ}{2} = 30^\circ$$

Now, $ADBC$ is a cyclic quad.

$\angle ADB = 180^\circ - 30^\circ = 150^\circ$ (Sum of opposite angle of a cyclic quadrilateral is 180°)

$$\therefore \angle ADB - \angle ACB$$

$$150^\circ - 30^\circ = 120^\circ$$



In $\triangle ABD$,

$BD = 9$ (By pythagorean triplet)

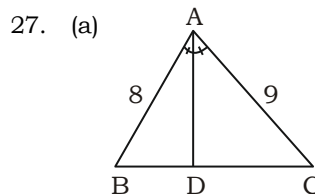
(9, 12, 15)

In $\triangle ADC$,

$DC = 5$ (By pythagorean triplet)

(5, 12, 13)

$$\therefore BC = 9 + 5 = 14 \text{ cm}$$



Let, $BD = x$, $DC = 12 - x$

By angle bisector theorems,

$$\frac{AB}{AC} = \frac{BD}{DC}$$

$$\frac{8}{9} = \frac{x}{12 - x}$$

$$96 - 8x = 9x$$

$$96 = 17x$$

$$x = \frac{96}{17}$$

$$BD = 5 \frac{11}{17} \text{ cm}$$

28. (a) Sum of all 3 angles of a triangle = 180°

$$\Rightarrow x + x + 2x = 180^\circ$$

$$\Rightarrow 4x = 180^\circ$$

$$\Rightarrow x = 45^\circ$$

Largest angle = 90°

$$\frac{90}{180} \times 100\% = 50\%$$

SMART APPROACH:-

Angles's ratio = $1 : 1 : 2$

Largest angles = 2 units

Total Angles = 4 units

Largest angle : Total Angles = $2 : 4$

Hence, The largest angle is

50% of the total angles

29. (a) Given,

$$\angle A = 80^\circ, \angle B = 40^\circ$$

and $\triangle ABC \cong \triangle FDE$

So that,

$$\angle A = \angle F, \angle B = \angle D \text{ and } \angle C = \angle E$$

$$\angle C = 180^\circ - (\angle A + \angle B)$$

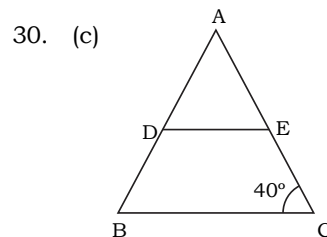
$$\angle C = 180^\circ - 120^\circ$$

$$\angle C = 60^\circ$$

$$\angle C = \angle E = 60^\circ$$

and $AB = FD = 5 \text{ cm}$

Hence, Option (a) is correct.



$$\angle ACB = \angle AED = 40^\circ$$

In $\triangle ADE$,

$$\angle DAE + \angle ADE + \angle AED = 180^\circ$$

$$\angle DAE + \angle ADE = 180^\circ - \angle AED$$

$$\Rightarrow \angle DAE + \angle ADE = 180^\circ - 40^\circ$$

$$\Rightarrow \angle DAE + \angle ADE = 140^\circ$$

-

$$AD = \frac{AB^2}{AC}$$

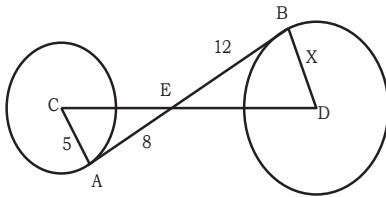
$$\Rightarrow AD = \frac{8 \times 8}{17}$$

A circle with center O is shown. A secant line passes through points A and B on the circumference. A point outside the circle is connected to O and to A and B , forming two 30° angles at the external point.

36. (b) 

Selected प्रSelection तरा लखई 184

39. (b) In figure,



$$\angle CAE = \angle DBE$$

$$\angle AEC = \angle BED$$

$$\angle ECA = \angle EDB$$

Hence, $\triangle CAE \sim \triangle DBE$

$$\frac{CA}{DB} = \frac{AE}{BE}$$

$$\Rightarrow \frac{5}{x} = \frac{8}{12}$$

$$\Rightarrow x = 7.5$$

In $\triangle CAE$

$$CE = \sqrt{AC^2 + AE^2}$$

$$= \sqrt{5^2 + 8^2} = \sqrt{89} = 9.43$$

Again in $\triangle DBE$

$$DE = \sqrt{BD^2 + BE^2} = \sqrt{7.5^2 + 12^2}$$

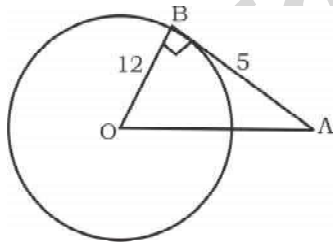
$$= \sqrt{56.25 + 144} = \sqrt{200.25} = 14.15$$

Distance between Centre,

$$CD = CE + DE$$

$$= 9.43 + 14.15 = 23.58 \text{ units}$$

40. (d)

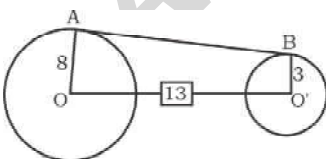


$$OA = \sqrt{OB^2 + AB^2}$$

$$= \sqrt{12^2 + 5^2}$$

$$= \sqrt{144 + 25} = \sqrt{169} = 13 \text{ cm}$$

41. (b)

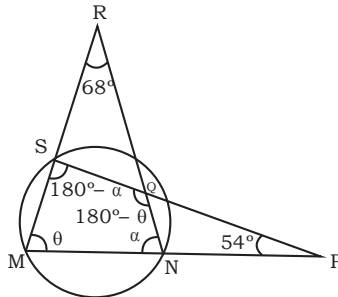


$$AB = \sqrt{(DB)^2 - (R - r)^2}$$

$$= \sqrt{13^2 - (8 - 3)^2}$$

$$= \sqrt{169 - 25} = \sqrt{144} = 12 \text{ cm}$$

42. (a)



Let $\angle RMN = \theta$

and $\angle MNR = \alpha$

We know, sum of opposite angles in cyclic quadrilateral is 180°

So, $\angle PSM = 180^\circ - \alpha$

In $\triangle RMN$,

$$\Rightarrow \angle RMN + \angle MNR + \angle MRN = 180^\circ$$

$$\Rightarrow \theta + \alpha + 68^\circ = 180^\circ$$

$$\Rightarrow \theta + \alpha = 112^\circ \quad \dots\dots\dots(1)$$

Again, in $\triangle PSM$,

$$\Rightarrow \angle PSM + \angle SMP + \angle MPS = 180^\circ$$

$$\Rightarrow 180^\circ - \alpha + \theta + 54^\circ = 180^\circ$$

$$\Rightarrow \theta + 54^\circ = \alpha$$

From equation(1)

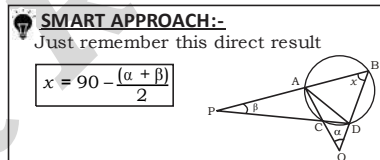
$$\Rightarrow \theta + \theta + 54^\circ = 112^\circ$$

$$\Rightarrow 2\theta = 112^\circ - 54^\circ$$

$$\Rightarrow \theta = \frac{58^\circ}{2}$$

$$\Rightarrow \theta = 29^\circ$$

Therefore, $\angle RMN = \angle SMN = 29^\circ$

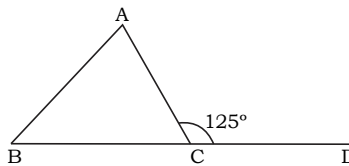


43. (c) Ratio of areas of triangles

$$= \left(\frac{36}{24} \right)^2 = \frac{9}{4}$$

Thus, Ratio = 9 : 4

44. (d) Given, $AB = AC$



Hence, $\angle ABC = \angle ACB$

By the linear pair

$$\angle ACB + \angle ACD = 180^\circ$$

$$\angle ACB = 180^\circ - \angle ACD$$

$$= 180^\circ - 125^\circ = 55^\circ$$

By the exterior angle.

$$\angle ABC + \angle BAC = 125^\circ$$

$$\Rightarrow 55^\circ + \angle BAC = 125^\circ$$

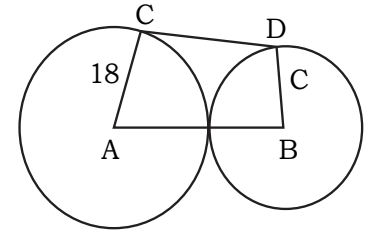
$$\Rightarrow \angle BAC = 125^\circ - 55^\circ = 70^\circ$$

45. (c)

$$AC = R = 18 \text{ cm}$$

$$BD = r = 8 \text{ cm}$$

$$AB = 18 + 8 = 26 \text{ cm}$$



$$DCT, CD = \sqrt{(AB)^2 - (R - r)^2}$$

$$= \sqrt{AB^2 - (AC - BD)^2}$$

$$= \sqrt{26^2 - (18 - 8)^2}$$

$$= \sqrt{676 - 100}$$

$$= \sqrt{576} = 24 \text{ cm}$$

46. (a)

Since, $DE \parallel BC$ in $\triangle ABC$

$$\frac{AD}{DB} = \frac{AE}{EC}$$

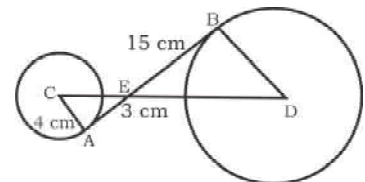
$$\Rightarrow \frac{5}{10} = \frac{8}{EC}$$

$$\Rightarrow EC = 16 \text{ cm}$$

$$AC = AE + EC$$

$$= 8 + 16 = 24 \text{ cm}$$

47. (d)



In $\triangle ACE$

$$CE = \sqrt{4^2 + 3^2} = \sqrt{25} = 5 \text{ cm}$$

$\triangle CAE \sim \triangle DBE$

$$\Rightarrow \frac{CE}{DE} = \frac{AE}{EB}$$

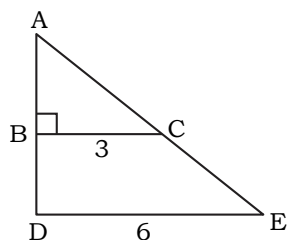
$$\Rightarrow \frac{5}{DE} = \frac{3}{15}$$

$$\Rightarrow DE = 25 \text{ cm}$$

Distance between Center, CD

$$= CE + ED = 5 + 25 = 30 \text{ cm}$$

48. (d) Given,



BD = 4 unit

Let AB = x unit

AD = AB + BD

= x + 4 unit

$\triangle ABC \sim \triangle ADE$

$$\Rightarrow \frac{AB}{AD} = \frac{BC}{DE}$$

$$\Rightarrow \frac{x}{x+4} = \frac{3}{6}$$

$$\Rightarrow 6x = 3x + 12$$

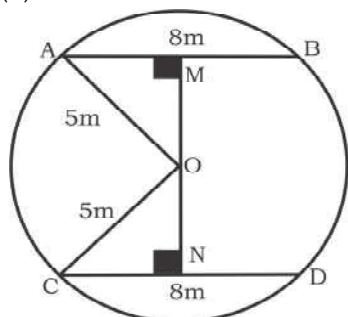
$$\Rightarrow 6x - 3x = 12$$

$$\Rightarrow 3x = 12$$

$$\Rightarrow x = 4 \text{ unit}$$

Hence, Length of AB = 4 unit.

49. (b)



Given, Radius = 5 m

AB = CD = 8 m

We know that,

Perpendicular from the center of the circle bisects the chord.

Hence, $AM = \frac{AB}{2}$

$$= \frac{8m}{2} = 4m$$

And, $CN = \frac{AB}{2} = \frac{8m}{2} = 4m$

In $\triangle AMO$, $OM^2 = OA^2 - AM^2$
 $= 5^2 - 4^2 = 9$

$$\therefore OM = 3m$$

In $\triangle CNO$, $ON^2 = OC^2 - CN^2$
 $= 5^2 - 4^2 = 9$

$$\therefore ON = 3m$$

Thus, The distance between center = OM + ON
 $= 3 + 3 = 6m$

Alternate Method:

Distance between center

$$= 2 \times \sqrt{5^2 - \left(\frac{8}{2}\right)^2} = 2\sqrt{5^2 - 4^2}$$

$$= 2\sqrt{25 - 16} = 2\sqrt{9} = 6m$$

50. (b)

Let $2\angle A = 3\angle B = 6\angle C = k$

$$\angle A = \frac{k}{2} \quad \angle B = \frac{k}{3} \quad \angle C = \frac{k}{6}$$

We know that,

$$\angle A + \angle B + \angle C = 180^\circ$$

$$\Rightarrow \frac{k}{2} + \frac{k}{3} + \frac{k}{6} = 180^\circ$$

$$\Rightarrow \frac{3k + 2k + k}{6} = 180^\circ$$

$$\Rightarrow \frac{6k}{6} = 180^\circ$$

$$\Rightarrow k = 180^\circ$$

Thus,

$$\angle A = \frac{k}{2} = \frac{180^\circ}{2} = 90^\circ$$

$$\angle B = \frac{k}{3} = \frac{180^\circ}{3} = 60^\circ$$

$$\angle C = \frac{k}{6} = \frac{180^\circ}{6} = 30^\circ$$

The value of largest angle = 90°

Alternate Method:

Using Ratio-

$$2\angle A = 3\angle B = 6\angle C$$

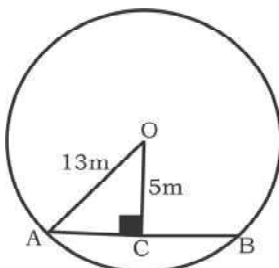
$$\Rightarrow \frac{2\angle A}{36} = \frac{3\angle B}{36} = \frac{6\angle C}{36}$$

$$\Rightarrow \frac{\angle A}{18} = \frac{\angle B}{12} = \frac{\angle C}{6}$$

Largest Angle,

$$\angle A = 180^\circ \times \frac{18}{18 + 12 + 6} = 90^\circ$$

51. (a) In $\triangle ACO$,



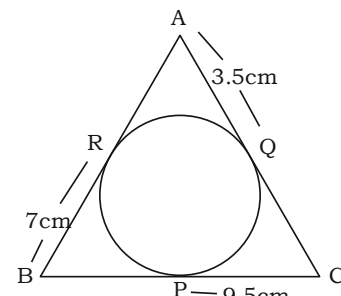
$$AC = \sqrt{AO^2 - OC^2} = \sqrt{13^2 - 5^2}$$

$$= \sqrt{169 - 25}$$

$$= \sqrt{144} = 12m$$

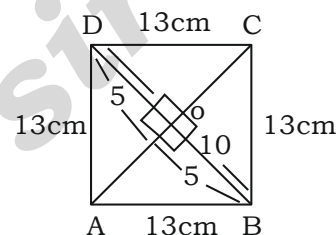
$$AB = 2 \times AC = 24m$$

52. (d)

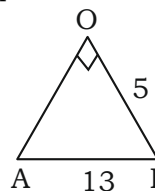


Perimeter of $\triangle ABC = 2(AQ + PC + BR)$
 $= 2(3.5 + 4.5 + 7) = 2 \times 15 = 30m$

53. (c)



In a rhombus two diagonals intersect each other at 90° in equal parts.



In a triangle AOB

$$AO = \sqrt{13^2 - 5^2}$$

$$= 12m$$

$$\therefore AO = 12m \text{ So, } OC = 12m$$

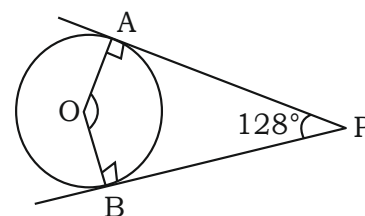
$$AC = 24m$$

$$\text{Area of a rhombus} = \frac{1}{2} \times BD \times AC$$

$$= \frac{1}{2} \times 10 \times 24$$

$$= 120m^2$$

54. (a)

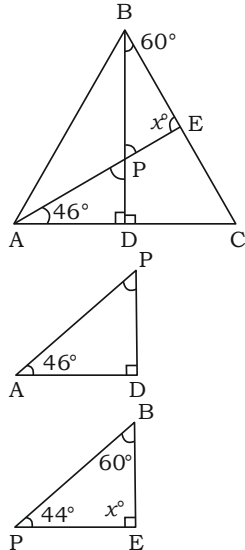


$$\therefore \angle AOB + \angle APB = 180^\circ$$

$$\angle AOB = 180^\circ - 128^\circ = 52^\circ$$

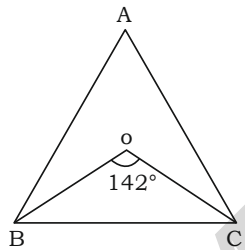
$$\angle OAB = \frac{180 - 52}{2} = 64^\circ$$

55. (a)



$\therefore \angle APD = \angle BPE$
In Triangle APD
 $\angle APD = 44^\circ$
 $\angle BPE = 44^\circ$
 $\angle BEP = x^\circ$
 $x + 44^\circ + 60^\circ = 180^\circ$
 $x = 76^\circ$

56. (d)



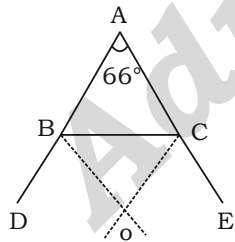
$$\angle BOC = 90^\circ + \frac{\angle A}{2}$$

$$142^\circ = 90^\circ + \frac{\angle A}{2}$$

$$\frac{\angle A}{2} = 52^\circ$$

$$\angle A = 104^\circ$$

57. (c)

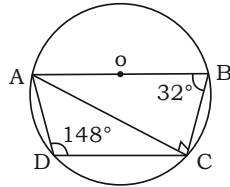


$\therefore \angle A = 66^\circ$
 $\angle BOC = ?$

$$\angle BOC = 90^\circ - \frac{\angle A}{2}$$

$$= 90^\circ - \frac{66^\circ}{2} = 90^\circ - 33^\circ = 57^\circ$$

58. (c)



$\therefore \angle ADC = 148^\circ$
 $\angle ABC = 180^\circ - 148^\circ = 32^\circ$
 $\angle BAC = 90^\circ - 32^\circ = 58^\circ$

59. (b) If $\triangle ABC \sim \triangle RPQ$

Then, $\frac{AB}{RP} = \frac{BC}{PQ} = \frac{AC}{RQ}$

$$= \frac{\sqrt{\text{ar}(\triangle ABC)}}{\sqrt{\text{ar}(\triangle RPQ)}}$$

$$\therefore \frac{\text{ar}(\triangle ABC)}{\text{ar}(\triangle RPQ)} = \frac{BC^2}{PQ^2}$$

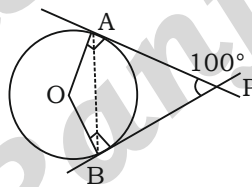
$$\frac{4}{9} = \frac{16}{PQ^2} \quad [\because BC = 4\text{cm}]$$

$$PQ^2 = 36$$

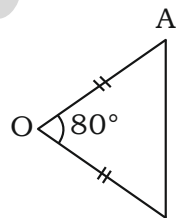
$$PQ^2 = 6^2$$

$$PQ = 6\text{ cm}$$

60. (a)

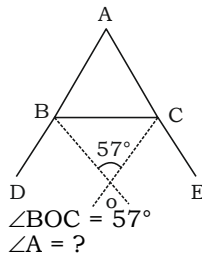


$\therefore \angle APB = 100^\circ$
 $\angle APB + \angle AOB = 180^\circ$
 $\angle AOB = 180^\circ - 100^\circ = 80^\circ$
In $\triangle OAB$ -



$OA = OB = \text{radius of circle}$
 $\angle OAB = 50^\circ$

61. (c)



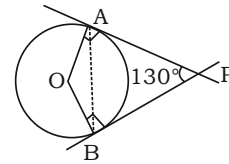
$\angle BOC = 57^\circ$
 $\angle A = ?$
 $\angle BOC = 90^\circ - \frac{\angle A}{2}$

$$\frac{\angle A}{2} = 90^\circ - \angle BOC$$

$$\frac{\angle A}{2} = 90^\circ - 57^\circ$$

$$\angle A = 66^\circ$$

62. (c)



$$\angle AOB = 180^\circ - 130^\circ = 50^\circ$$

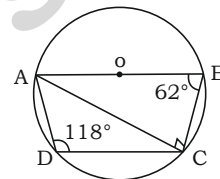
In $\triangle OAB$

$$\angle AOB = 50^\circ$$

$$\angle OAB = \frac{130^\circ}{2} = 65^\circ$$

$$\therefore OA = OB = \text{radius of circle}$$

63. (b)



$$\angle ABC = 180^\circ - 118^\circ = 62^\circ$$

$$\angle BAC = 90^\circ - 62^\circ = 28^\circ$$

64. (d) $\therefore \triangle ABC \sim \triangle RPQ$

$$\frac{AB}{RP} = \frac{BC}{PQ} = \frac{AC}{RQ} = \frac{\sqrt{\text{ar}(\triangle ABC)}}{\sqrt{\text{ar}(\triangle RPQ)}}$$

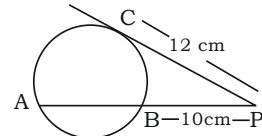
$$\frac{\sqrt{4}}{\sqrt{9}} = \frac{AB}{RP}$$

$$\frac{2}{3} = \frac{3}{RP} \quad [\because AB = 3\text{cm}]$$

$$RP = \frac{9}{2}$$

$$RP = 4.5\text{ cm}$$

65. (d)



$$\therefore PC = 12\text{ cm}$$

$$PB = 10\text{ cm}$$

$$AB = ?$$

$$AP \times BP = PC^2$$

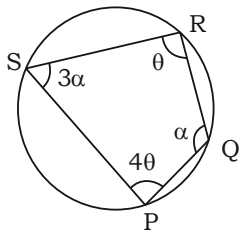
$$(AB + 10) \times 10 = 12^2$$

$$AB + 10 = \frac{144}{10}$$

$$AB = 14.4 - 10$$

$$AB = 4.4\text{ cm}$$

66. (a)



In a cyclic quadrilateral sum of opposite angles is 180°

$$\theta + 4\theta = 180^\circ$$

then,

$$\theta = 36^\circ$$

Similarly

$$\alpha + 3\alpha = 180^\circ$$

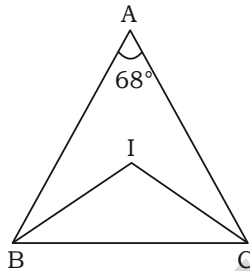
then,

$$\alpha = 45^\circ$$

$$\text{Average of } \angle \theta \text{ and } \angle \alpha = \frac{36^\circ + 45^\circ}{2}$$

$$= \frac{81^\circ}{2} = 40.5^\circ$$

67. (a)



$$\angle A = 68^\circ$$

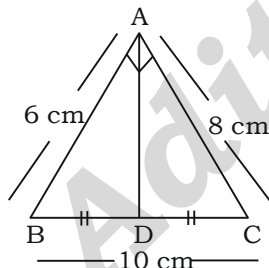
$$\angle BIC = ?$$

In an incentric triangle-

$$\angle BIC = 90^\circ + \frac{\angle A}{2} = 90^\circ + \frac{68^\circ}{2}$$

$$= 90^\circ + 34^\circ = 124^\circ$$

68. (b)



$$\therefore BC^2 = AB^2 + AC^2$$

This is a right angle triangle

$$\angle A = 90^\circ$$

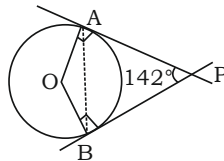
we know, In a right angle triangle the length of the median is always half of the hypotenus

then,

$$BD = DC = AD$$

$$AD = 5\text{cm}$$

69. (c)



$$\therefore \angle APB = 142^\circ$$

$$\angle AOB = 180^\circ - 142^\circ$$

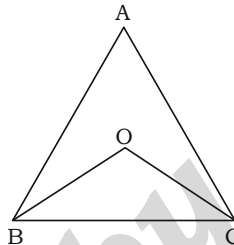
$$= 38^\circ$$

In $\triangle OAB$ -

$$\therefore OA = OB = \text{radius of circle}$$

$$\angle OAB = \frac{180 - 38}{2} = \frac{142^\circ}{2} = 71^\circ$$

70. (b)



$$\angle BOC = 134^\circ$$

In an incetric triangle -

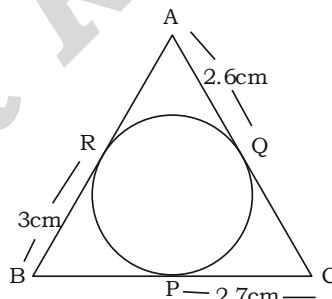
$$\angle BOC = 90^\circ + \frac{\angle A}{2}$$

$$134^\circ = 90 + \frac{\angle A}{2}$$

$$\frac{\angle A}{2} = 44^\circ$$

$$\angle A = 88^\circ$$

71. (c)



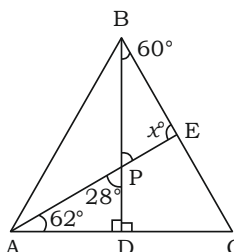
$$\text{Perimeter of } \triangle ABC = ?$$

$$\text{Perimeter of } \triangle ABC = 2(AQ + PC + BR)$$

$$= 2(2.6 + 2.7 + 3) = 2 \times 8.3$$

$$= 16.6\text{ cm}$$

72. (d)



$$x^\circ = ?$$

$$\angle APD = 90^\circ - 62^\circ = 28^\circ$$

$$\therefore \angle APD = \angle BPE$$

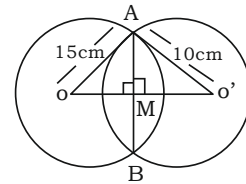
In triangle BPE

$$60^\circ + x^\circ + 28^\circ = 180^\circ$$

$$x^\circ = 180^\circ - 88^\circ$$

$$x^\circ = 92^\circ$$

73. (c)



$$AB = 16\text{ cm}$$

$$AM = \frac{AB}{2} = 8\text{ cm}$$

In $\triangle OMA$ -

$$OM = \sqrt{15^2 - 8^2} = \sqrt{161}\text{ cm}$$

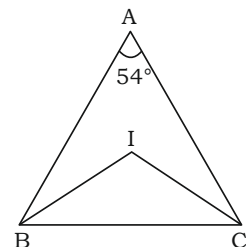
In $\triangle O'MA$ -

$$O'M = \sqrt{10^2 - 8^2} = 6\text{ cm}$$

Distance between their centre $(OO') = O'M + OM$

$$= (6 + \sqrt{161})\text{ cm}$$

74. (d)



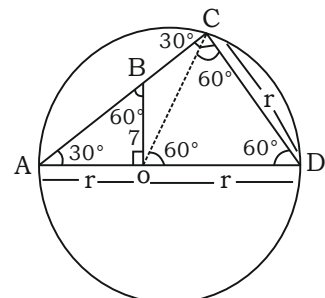
In an incentric triangle

$$\angle BIC = 90^\circ + \frac{\angle A}{2}$$

$$\angle BIC = 90^\circ + \frac{54^\circ}{2}$$

$$= 90^\circ + 27^\circ = 117^\circ$$

75. (c)



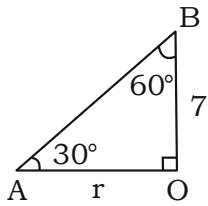
In a right angle triangle ACD

$$AD^2 = DC^2 + AC^2$$

$$AC^2 = (2r)^2 - r^2$$

$$AC = r\sqrt{3}$$

In $\angle AOB$



$$\tan 30^\circ = \frac{7}{r}$$

$$r = 7\sqrt{3} \text{ cm}$$

$$\sin 30^\circ = \frac{7}{AB}$$

$$\frac{1}{2} = \frac{7}{AB}$$

$$AB = 14 \text{ cm}$$

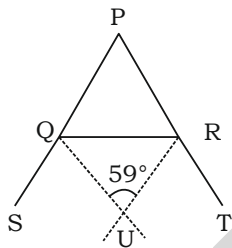
$$\therefore AC = r\sqrt{3}$$

$$AC = 7\sqrt{3} \times \sqrt{3} = 21 \text{ cm}$$

$$AB = 14 \text{ cm}$$

$$BC = AC - AB = 21 - 14 = 7 \text{ cm}$$

76. (d)



$$\angle QUR = 59^\circ$$

$$\angle P = ?$$

$$\therefore \angle QUR = 90^\circ - \frac{\angle P}{2}$$

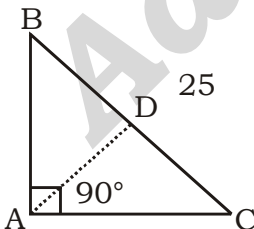
$$\frac{\angle P}{2} = 90^\circ - \angle QUR$$

$$= 90^\circ - 59^\circ = 31^\circ$$

$$\angle P = 31^\circ \times 2$$

$$\angle P = 62^\circ$$

77. (b)



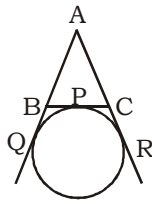
BAC is right-angle triangle, BC is hypotenuse

We know,

in right triangle

$$\text{Median} = \frac{\text{hypotenuse}}{2} = \frac{25}{2} = 12.5 \text{ cm}$$

78. (b)



$$AQ = AR$$

$$BP = BQ$$

$$CP = CR$$

$$\text{Perimeter of } \triangle ABC = AB + BP + PC + AC$$

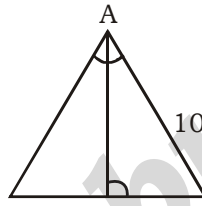
$$26.4 = AB + BQ + CR + AC$$

$$26.4 = AQ + AR$$

$$26.4 = 2AQ$$

$$AQ = \frac{26.4}{2} = 13.2 \text{ cm}$$

79. (a)



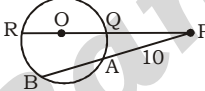
$$\angle ADC = \angle BAC \text{ (given)}$$

$$\triangle DCA \sim \triangle ACB$$

$$\frac{CD}{AC} = \frac{AC}{BC} \Rightarrow \frac{CD}{10} = \frac{10}{16}$$

$$= CD = 6.25 \text{ cm}$$

80. (c)



Given,

$$PA = 10$$

$$PB = 16$$

$$OP = 14$$

$$OR = OQ,$$

$$PQ = (14 - OQ)$$

$$PR = (14 + OQ)$$

We know,

$$PQ \times PR = PA \times PB$$

$$(14 - OQ)(14 + OQ) = 10 \times 16$$

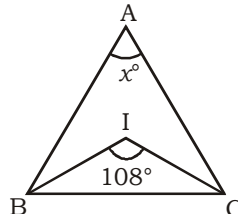
$$(14^2 - OQ^2) = 160$$

$$OQ^2 = 36$$

$$OQ = 6 \text{ cm}$$

$$\text{Diameter} = 2 \times 6 = 12 \text{ cm}$$

81. (d)

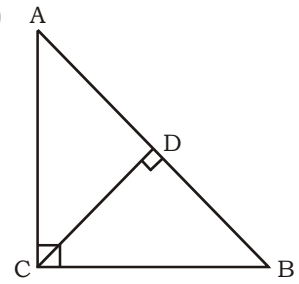


$$\angle BIC = 90 + \frac{x}{2}$$

$$= 90 + \frac{x}{2} = 108^\circ$$

$$= x = 36^\circ$$

82. (d)



Given that,

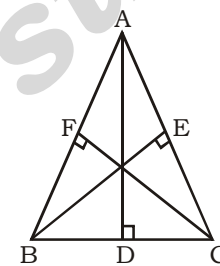
$$\frac{AD}{DB} = \frac{\sqrt{k}}{1}$$

We know,

$$\rightarrow AC^2 : BC^2 = AD : BD$$

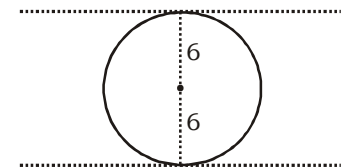
$$\rightarrow AC : BC = \sqrt[4]{k} : 1$$

83. (d)



$$3AC^2 = 4BE^2 \text{ (This is a theorem)}$$

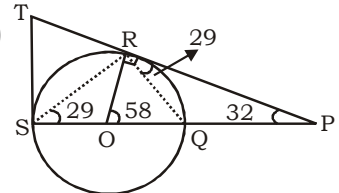
84. (b)



Required distance

$$(6 + 6) = 12 \text{ cm}$$

85. (d)



Given that $\angle SPT = 32^\circ$

Then,

in $\triangle ROP$

$$\Rightarrow \angle R = 90^\circ, \angle P = 32^\circ$$

Then,

$$\angle O = 180^\circ - (90 + 32) = 58^\circ$$

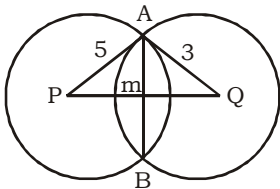
Then,

$$\angle RSQ = \frac{58}{2} = 29^\circ$$

We know,

$$\angle RSQ = \angle QRP = 29^\circ$$

86. (d)



AP = 5 cm, AQ = 3 cm and PQ = 6 cm

Let PM = x cm

In $\triangle AMP$

$$(PA)^2 = (AM)^2 + (PM)^2$$

$$25 = (AM)^2 + x^2$$

$$(AM)^2 = 25 - x^2$$

In $\triangle AQM$

$$(AQ)^2 = (AM)^2 + (6 - x)^2$$

$$9 = (AM)^2 + 36 + x^2 - 12x$$

$$(AM)^2 = 9 - 36 - x^2 + 12x$$

$$25 - x^2 = 9 - 36 - x^2 + 12x$$

$$x = \frac{52}{12} = \frac{13}{3}$$

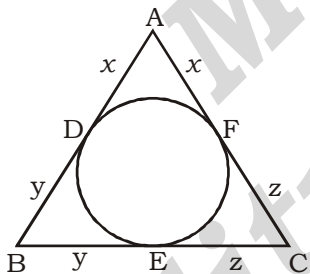
$$(AM)^2 = 25 - x^2 = 25 - \frac{169}{9} = \frac{56}{9}$$

$$AM = \sqrt{\frac{56}{9}} = \frac{2\sqrt{14}}{3} \text{ cm}$$

So,

$$AB = 2 \times AM = \frac{2 \times 2\sqrt{14}}{3} = \frac{4\sqrt{14}}{3} \text{ cm}$$

87. (a)



We know,

AD = AF, FC = EC and BE = BD

AB = 12 cm, BC = 8 cm, BE = BD

AB = 12 cm, BC = 8 cm, AC = 10 cm (given)

$$2(x + y + z) = (12 + 8 + 10)$$

$$= 2(x + y + z) = 30 \text{ cm}$$

$$= (x + y + z) = 15 \text{ cm}$$

In $\triangle ABC$ (x + y) = 12 cm

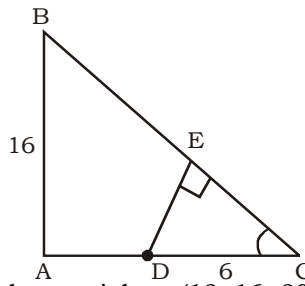
$$y + z = 8 \text{ cm}$$

$$z = 3 \text{ cm and } x = 7 \text{ cm}$$

$$\text{Difference} = AD - CE$$

$$= (7 - 3) = 4 \text{ cm}$$

88. (a)



We know triplet = (12, 16, 20)

So, BC = 20

$$\text{Area of } \triangle ABC = \frac{1}{2} \times 12 \times 16$$

$$= 96 \text{ cm}^2$$

$\triangle ABC \sim \triangle EDC$

$$\frac{\text{Area of } \triangle EDC}{\text{Area of } \triangle ABC} = \left(\frac{DC}{BC}\right)^2$$

$$\text{Area of } \triangle EDC = \frac{96 \times 36}{400} = 8.64 \text{ cm}^2$$

89. (d) Radius of circumcircle

$$= \frac{a \times b \times c}{4 \times \triangle ABC}$$

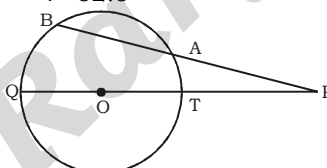
Given triangle is a right angled triangle area

$$= \frac{1}{2} \times 10 \times 10.5 = 52.5 \text{ cm}^2$$

Radius of circumcircle

$$= \frac{(10 \times 10.5 \times 14.5)}{4 \times 52.5} = 7.25 \text{ cm}$$

90. (b)



Given, PA = 18 cm, PB = 32 cm & OP = 26 cm

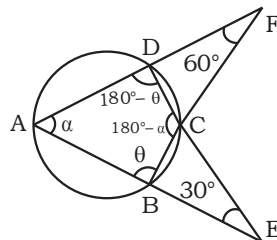
Thus, PQ = (26 + r) & PT = (26 - r)

We know, PT $\times$ PQ = PA $\times$ PB

$$\Rightarrow (26 + r) \times (26 - r) = 18 \times 32$$

$$\Rightarrow 676 - r^2 = 576 \Rightarrow r = 10 \text{ cm}$$

91. (b)



In $\triangle ABF$, $\alpha + \theta + 60^\circ = 180^\circ$

$$\Rightarrow \alpha + \theta = 120^\circ \text{ ----(1)}$$

In $\triangle ADE$, $\alpha + 180^\circ - \theta + 30^\circ = 180^\circ$

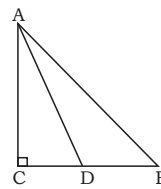
$$\Rightarrow \alpha - \theta + 30^\circ = 0^\circ \text{ ----(2)}$$

On solving (1) and (2), we get-

$$\Rightarrow \alpha = 45^\circ \text{ and } \theta = 75^\circ$$

$$\therefore \angle ABC = 75^\circ$$

92. (c)



In $\triangle ABC$, $AB^2 = AC^2 + BC^2$

$$\Rightarrow AB^2 = 5^2 + 12^2 = 169$$

$$\Rightarrow AB = 13$$

Here, AD is angle bisector of $\angle A$.

$$\text{So, } \frac{AC}{AB} = \frac{CD}{DB}$$

$$\Rightarrow \frac{5}{13} = \frac{CD}{DB}$$

Let CD = 5x and DB = 13x

BC = CD + DB

$$\Rightarrow 12 = 5x + 13x$$

$$\Rightarrow x = \frac{12}{18} = \frac{2}{3}$$

$$CD = 5x = 5 \times \frac{2}{3} = \frac{10}{3}$$

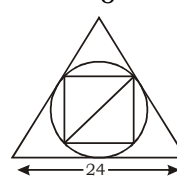
In $\triangle ACD$, $AD^2 = CD^2 + AC^2$

$$\Rightarrow AD^2 = \left(\frac{10}{3}\right)^2 + 5^2 = \frac{100}{9} + 25$$

$$\Rightarrow AD^2 = \frac{100 + 225}{9} = \frac{325}{9}$$

$$\Rightarrow AD = \frac{5\sqrt{13}}{3} \text{ cm}$$

93. (c)



Side of triangle = 24 cm

In-radius of triangle

$$= \frac{a}{2\sqrt{3}} = \frac{24}{2\sqrt{3}} = 4\sqrt{3}$$

Diagonal of inscribed square =

Diameter of the circle = $2 \times 4\sqrt{3}$

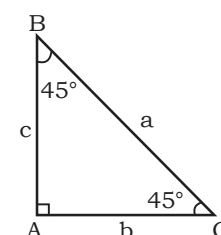
$$= 8\sqrt{3} \text{ cm}$$

$$\text{Area of square} = \frac{(\text{diagonal})^2}{2}$$

$$= \frac{8\sqrt{3} \times 8\sqrt{3}}{2} = 96 \text{ cm}^2$$

94. (c) Given, In right angle $\triangle ABC$

$\angle A = \angle B$



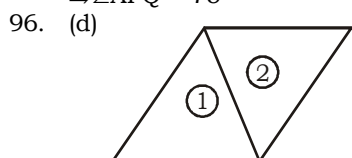
Let $A = 90$
 $\angle B = 45$
 As we know,
 $BC^2 = AC^2 + AB^2$
 $a^2 = b^2 + c^2$... (1)

If $\angle B = \angle C$
 So, $AC = AB$
 $\angle B = \angle C$
 from equation (1)

$$a^2 = b^2 + c^2$$

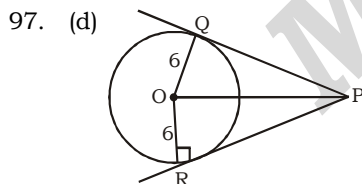
$$a^2 = b^2 + bc$$

95. (d) We know,
 $\angle PAQ = 90^\circ$ [PQ is a diameter]
 $\angle BAQ = 105^\circ$ (Given)
 $\angle BAP + \angle PAQ = 105^\circ$
 $\angle BAP = 15^\circ$
 As we know,
 $\angle BAP = \angle AQP = 15^\circ$ [By Alt-Seg-T]
 in $\triangle APQ$,
 $\angle APQ + \angle PAQ + \angle AQP = 180^\circ$
 $\Rightarrow \angle APQ + 90^\circ + 15^\circ = 180^\circ$
 $\Rightarrow \angle APQ = 75^\circ$



As we know, height of triangle and height of quadrilateral will be same
 $\therefore$ Height of the triangle = Height of the quadrilateral

$$= \frac{\sqrt{3}}{2} a = \frac{\sqrt{3}}{2} \times 10\sqrt{3} = 15 \text{ cm}$$



in $\triangle OQP$
 $(OP)^2 = (OQ)^2 + (QP)^2$
 $\Rightarrow 10^2 = 6^2 + (QP)^2$
 $\Rightarrow (QP)^2 = 64$
 $\Rightarrow QP = 8 \text{ cm}$

$$\text{Area of } \triangle OPQ = \frac{1}{2} \times \text{Base} \times \text{height}$$

$$= \frac{1}{2} \times 6 \times 8 = 24 \text{ cm}$$

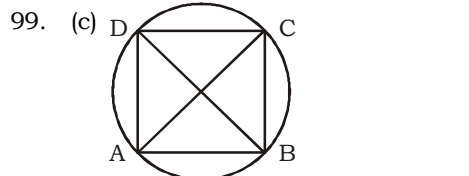
Area of quadrilateral PQOR
 $= 2 \times \text{Area of } \triangle OPQ$
 $= 2 \times 24 = 48 \text{ cm}^2$

98. (c) Given,
 $\angle PQR = 78^\circ$ & $\angle TPS = 24^\circ$

$$\text{We know, } \angle TPS = \frac{\angle Q - \angle R}{2}$$

$$\Rightarrow 78^\circ - R = 24^\circ \times 2$$

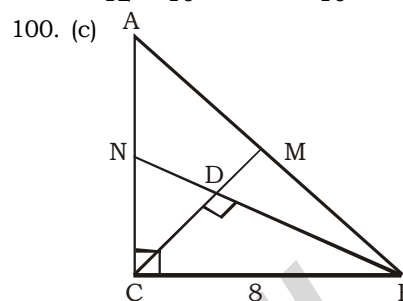
$$\Rightarrow \angle R = 30^\circ$$



$AB = 15 \text{ cm}$, $BC = 12 \text{ cm}$, $CD = 10 \text{ cm}$

By the property, $\frac{AD}{BC} = \frac{AB}{CD}$

$$\Rightarrow \frac{AD}{12} = \frac{15}{10} \Rightarrow AD = \frac{12 \times 15}{10} = 18 \text{ cm}$$



As BN and CM are medians of $\triangle ABC$, D is centroid of the triangle
 So, D will divide BN in the ratio 2 : 1

$$BD : DN = 2 : 1$$

$$\Rightarrow BN = 3x$$

Also, In right angled $\triangle CNB$, CD is perpendicular to BN

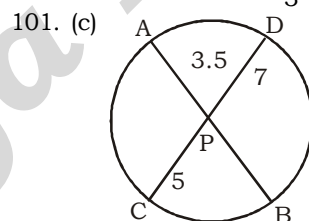
$$\Rightarrow BC^2 = BD \times BN$$

$$\Rightarrow (8)^2 = 2x \times 3x$$

$$\Rightarrow 6x^2 = 64$$

$$\Rightarrow x = \frac{4\sqrt{6}}{3}$$

$$\therefore BN = 3x = 3 \times \frac{4\sqrt{6}}{3} = 4\sqrt{6} \text{ cm}$$

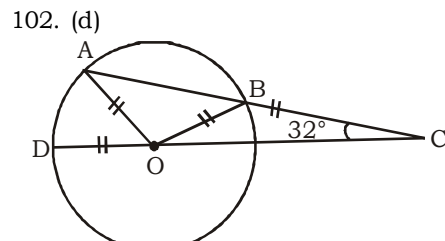


As we know, When two chords intersect each other internally-

$$AP \times PB = PC \times PD$$

$$\Rightarrow 3.5 \times PB = 7 \times 5$$

$$\Rightarrow PB = 10 \text{ cm}$$



In $\triangle OBC$

If $OB = BC$, then

$$\angle BOC = \angle BCO = 32^\circ$$

As we know,

$$\angle OBA = \angle BOC + \angle BCO = 32^\circ + 32^\circ = 64^\circ$$

If $OA = OB$, then

$$\angle OBA = \angle OAB = 64^\circ$$

In $\triangle AOB$

$$\angle AOB + \angle OAB + \angle OBA = 180^\circ$$

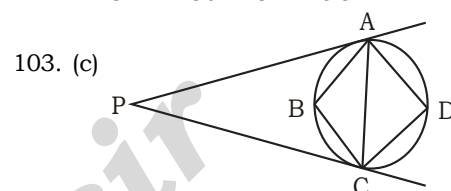
$$\angle AOB + 64^\circ + 64^\circ = 180^\circ$$

$$\angle AOB = 180^\circ - 128^\circ = 52^\circ$$

$$\angle AOD + \angle AOB + \angle BOC = 180^\circ$$

$$\angle AOD + 52^\circ + 32^\circ = 180^\circ$$

$$\angle AOD = 180^\circ - 84^\circ = 96^\circ$$



Given $\angle ABC = 98^\circ$

$$\angle B + \angle D = 180^\circ$$

$$\angle D = 180^\circ - 98^\circ = 82^\circ$$

$$\angle PAC = \angle PCA = \angle ADC = 82^\circ$$

[Alternate segment Theorem]

In $\triangle PAC$

$$\angle APC + \angle PAC + \angle PCA = 180^\circ$$

$$\angle APC + 82^\circ + 82^\circ = 180^\circ$$

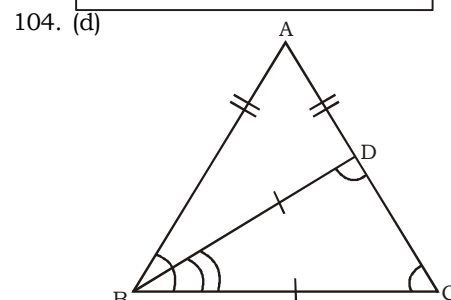
$$\angle APC = 16^\circ$$



SMART APPROACH:-

$$\angle APC = 180^\circ - 2\angle ADC$$

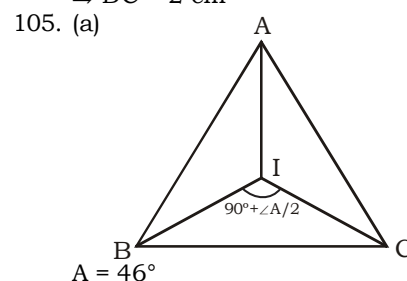
$$= 180^\circ - 2 \times 82^\circ = 16^\circ$$



We know,
 $\triangle ABC \sim \triangle BDC$

$$\Rightarrow \frac{DC}{BC} = \frac{BC}{AC} \Rightarrow \frac{DC}{5} = \frac{5}{12.5}$$

$$\Rightarrow DC = 2 \text{ cm}$$



$$\angle BIC = 90^\circ + \frac{46^\circ}{2} = 113^\circ$$



MENSURATION-2D

21

प्रतिष्ठ लम्बे अक्षर

1. What is the area of a triangle whose sides are of lengths 12 cm, 13 cm and 5 cm?

किसी त्रिभुज की भुजाएँ 12 सेमी, 13 सेमी और 5 सेमी हैं। इस त्रिभुज का क्षेत्रफल क्या होगा?

SSC CPO 03/10/2023 (Shift-01)

- (a) 15 cm² (b) 30 cm²
(c) 40 cm² (d) 70 cm²

2. The sides of a triangle are in the ratio 5 : 12 : 13 and its perimeter is 90 cm. Find its area (in cm²).

1. त्रिभुज की भुजाएँ 5 : 12 : 13 के अनुपात में हैं और इसका परिमिटर 90 सेमी है। इस त्रिभुज का क्षेत्रफल क्या होगा?

SSC CPO 03/10/2023 (Shift-01)

- (a) 270 (b) 150
(c) 30 (d) 60

3. The area of an equilateral triangle is $4\sqrt{3}$ cm². Find the side (in cm) of the triangle.

1. त्रिभुज का क्षेत्रफल $4\sqrt{3}$ वर्ग सेमी है। त्रिभुज की भुजा की लंबाई क्या होगी?

SSC CPO 03/10/2023 (Shift-3)

- (a) $2\sqrt{3}$ (b) 2
(c) $\sqrt{3}$ (d) 4

4. The length and the breadth of the floor of a rectangular hall are 126 feet and 90 feet, respectively. What will be the area (in square feet) of each of the largest identical square tiles that can be used to tile this floor in a way that no part of the floor remains uncovered?

1. एक आयताकार हॉल की लंबाई 126 फीट और चौड़ाई 90 फीट है। इस हॉल को तिलाने के लिए कौन से सबसे बड़े समान आकार के वर्गाकार टाइल का उपयोग किया जा सकता है कि बिना किसी भी फ्लोर को कवर नहीं करने के बिना?

SSC CPO 03/10/2023 (Shift-3)

- (a) 196 (b) 256
(c) 324 (d) 484

5. The area of an equilateral triangle is 173.2 cm². Its side will be _____.

1. त्रिभुज का क्षेत्रफल 173.2 वर्ग सेमी है। इस त्रिभुज की भुजा की लंबाई क्या होगी?

SSC CPO 03/10/2023 (Shift-3)

- (a) 20 cm (b) 21.32 cm
(c) 17.32 cm (d) 22 cm

6. Find the area of a rhombus if the perimeter of the rhombus is 52 cm, and one of its diagonals is 10 cm long.

1. त्रिभुज का क्षेत्रफल 173.2 वर्ग सेमी है। इस त्रिभुज की भुजा की लंबाई क्या होगी?

SSC CPO 03/10/2023 (Shift-3)

- (a) 164 cm² (b) 144 cm²
(c) 160 cm² (d) 120 cm²

7. Find the area of a sector of a circle of radius 8 cm, formed by an arc of length 4.6 cm is.

3. त्रिभुज का क्षेत्रफल 173.2 वर्ग सेमी है। इस त्रिभुज की भुजा की लंबाई क्या होगी?

SSC CPO 03/10/2023 (Shift-3)

- (a) 18.4 cm² (b) 6.3 cm²
(c) 9.2 cm² (d) 120 cm²

8. The radius of a circle is 1.75 cm. What is the circumference of the circle? (Take $\pi = \frac{22}{7}$)

1. त्रिभुज का क्षेत्रफल 173.2 वर्ग सेमी है। इस त्रिभुज की भुजा की लंबाई क्या होगी?

SSC CPO 04/10/2023 (Shift-01)

- (a) 9.63 cm (b) 11 cm
(c) 5.5 cm (d) 22 cm

9. The area of a rectangular field is 480 m². If the length is 20% more than the breadth, then the length of the rectangular field is:

1. त्रिभुज का क्षेत्रफल 173.2 वर्ग सेमी है। इस त्रिभुज की भुजा की लंबाई क्या होगी?

SSC CPO 04/10/2023 (Shift-02)

- (a) 24 m (b) 20 m
(c) 27 m (d) 30 m

10. Find the area of a triangle whose length of two sides are 4 cm and 5 cm and the angle between them is 45°.

1. त्रिभुज का क्षेत्रफल 173.2 वर्ग सेमी है। इस त्रिभुज की भुजा की लंबाई क्या होगी?

SSC CPO 04/10/2023 (Shift-02)

- (a) $7\sqrt{2}$ cm² (b) $4\sqrt{2}$ cm²
(c) $6\sqrt{2}$ cm² (d) $5\sqrt{2}$ cm²

11. The area of a rhombus having one side measuring 17 cm and one diagonal measuring 16 cm is:

1. त्रिभुज का क्षेत्रफल 173.2 वर्ग सेमी है। इस त्रिभुज की भुजा की लंबाई क्या होगी?

SSC CPO 04/10/2023 (Shift-3)

- (a) 280 cm² (b) 210 cm²
(c) 180 cm² (d) 240 cm²

12. If circumference of the circle is 13.2 cm, then the radius of the

circle is _____. (Take $\pi = \frac{22}{7}$)

1. त्रिभुज का क्षेत्रफल 173.2 वर्ग सेमी है। इस त्रिभुज की भुजा की लंबाई क्या होगी?

जहाँ $\pi = \frac{22}{7}$

SSC CPO 04/10/2023 (Shift-3)

- (a) 4.2 cm (b) 2.1 cm
(c) 3.3 cm (d) 6.6 cm

13. In a circle of radius 42 cm, an arc subtends an angle of 60° at the centre. Find the length of the arc.

(Take $\pi = \frac{22}{7}$)

Selected प्रSelection तथा त्वर्ण 194

1. एक त्रिभुज की भुजाएँ 13 cm, 14 cm और 15 cm हैं। इस त्रिभुज का क्षेत्रफल ज्ञात करें।
 (a) 30 (b) 60
 (c) 120 (d) 90
48. The base of a triangle is equal to the perimeter of a square whose diagonal is $9\sqrt{2}$ cm, and its height is equal to the side of a square whose area is 144 cm^2 . The area of the triangle (in cm^2) is:
1. एक त्रिभुज की भुजाएँ 13 cm, 14 cm और 15 cm हैं। इस त्रिभुज का क्षेत्रफल ज्ञात करें।
 (a) 30 (b) 60
 (c) 120 (d) 90
49. If each side of an equilateral triangle is 12 cm, then its altitude is equal to:
1. एक त्रिभुज की भुजाएँ 12 cm हैं। इस त्रिभुज की उंचाई ज्ञात करें।
 (a) 288 (b) 216
 (c) 72 (d) 144
50. A chord of the larger among two concentric circles is of length 10 cm and its tangent to the smaller circle. What is the area (in cm^2) of the annulus portion between the two circles?
1. दो समकेंद्रीय वृत्तों में एक चord की लंबाई 10 cm है जो बड़े वृत्त की छाल पर स्पर्श रेखा है। इन दोनों वृत्तों के बीच के क्षेत्रफल ज्ञात करें।
 (a) $6\sqrt{3} \text{ cm}$ (b) $3\sqrt{6} \text{ cm}$
 (c) $6\sqrt{2} \text{ cm}$ (d) $3\sqrt{2} \text{ cm}$
51. PQRS is a rectangle T is a point on PQ such that RTQ is an isosceles triangle and $PT = 5 \text{ QT}$. If the area of triangle RTQ is $12\sqrt{3} \text{ sq. cm}$, then the area of the rectangle PQRS is:
1. PQRS एक आयत है। T एक बिंदु है जो PQ पर स्थित है। RTQ एक समद्विभुज त्रिभुज है। $PT = 5 \text{ QT}$ । त्रिभुज RTQ का क्षेत्रफल $12\sqrt{3} \text{ sq. cm}$ है। आयत PQRS का क्षेत्रफल ज्ञात करें।
 (a) 10 π (b) 25π
 (c) 15 π (d) $\frac{5\pi}{2}$
52. The two parallel sides of a trapezium are 27 cm and 13 cm respectively. If the height of the trapezium is 8 cm, then what is its area in m^2 ?
1. एक त्रिभुज की भुजाएँ 27 cm और 13 cm हैं। इस त्रिभुज की उंचाई 8 cm है। इस त्रिभुज का क्षेत्रफल ज्ञात करें।
 (a) 0.032 (b) 0.056
 (c) 0.016 (d) 0.32
53. The sides of a triangular park are 60 m, 112 m and 164 m. The cost of leveling the park at the rate of Rs. 8.50 m^2 is:
1. एक त्रिभुज की भुजाएँ 60 m, 112 m और 164 m हैं। इस त्रिभुज को सपाट करने का दर Rs. 8.50 m^2 है। इस त्रिभुज को सपाट करने का कुल खर्च ज्ञात करें।
 (a) Rs. 18,316 (b) Rs. 17,136
 (c) Rs. 18,164 (d) Rs. 17,085
54. The circumference of a circle exceeds its diameter by 60 cm. The area of the circle is.
1. एक वृत्त की परिधि उसकी व्यास से 60 cm अधिक है। इस वृत्त का क्षेत्रफल ज्ञात करें।
 (a) 536 cm^2 (b) 1078 cm^2
 (c) 346.5 cm^2 (d) 616 cm^2
55. A field is in the shape of a trapezium whose parallel sides are 200 m and 400 m long, whereas each of other two sides is 260 m long. What is the area (in m^2) of the field?
1. एक क्षेत्र त्रिभुज की आकार में है। इस त्रिभुज की समांतर भुजाएँ 200 m और 400 m हैं। अन्य दो भुजाएँ 260 m हैं। इस क्षेत्र का क्षेत्रफल ज्ञात करें।
 (a) 48000 (b) 52000
 (c) 72000 (d) 60000
56. A circular park whose diameter is 210 m has a 5 m wide path running around it (on the outside). What is area (in m^2) of the path?
1. एक वृत्तीय पार्क की व्यास 210 m है। इस पार्क के चारों ओर 5 m चौड़ा एक पथ है। इस पथ का क्षेत्रफल ज्ञात करें।
 (a) 1100 π (b) 1050 π
 (c) 1075 π (d) 1020 π
57. The sides of a triangular park are 35 m, 53 m and 66 m. The cost of leveling the park at the rate of Rs. 9.25 m^2 is:
1. एक त्रिभुज की भुजाएँ 35 m, 53 m और 66 m हैं। इस त्रिभुज को सपाट करने का दर Rs. 9.25 m^2 है। इस त्रिभुज को सपाट करने का कुल खर्च ज्ञात करें।
 (a) Rs. 8,584 (b) Rs. 8,547
 (c) Rs. 8,621 (d) Rs. 8,510
58. A field is in the form of a circle. The cost of fencing around it at Rs. 12 per metre is Rs. 2,640. What is the area (in m^2) of the field? (Take $\pi = \frac{22}{7}$)
1. एक क्षेत्र वृत्त की आकार में है। इस क्षेत्र को घेरने का दर Rs. 12 प्रति मीटर है। कुल खर्च Rs. 2,640 है। इस क्षेत्र का क्षेत्रफल ज्ञात करें।
 (a) 1925 m^2 (b) 3850 m^2
 (c) 2772 m^2 (d) 5544 m^2
59. The lengths of the parallel sides of a trapezium are 51 cm and 21 cm, and that of each of the other two sides is 39 cm. What is the area (in cm^2) of the trapezium?
1. एक त्रिभुज की समांतर भुजाएँ 51 cm और 21 cm हैं। अन्य दो भुजाएँ 39 cm हैं। इस त्रिभुज का क्षेत्रफल ज्ञात करें।
 (a) 1206 (b) 1296
 (c) 1152 (d) 1260
60. If the perimeter of an isosceles right triangle is $(16\sqrt{2} + 16) \text{ cm}$, then the area of the triangle is:

बीस 1 जसक तीरुदर हक 2 जसक सी वरु सजश
खेद शरु (16√2 + 16) सक 2 प्र ह सै वरु सजश
नरु शरु सैज। पस्र शरु

SSC CPO 12/12/2019 (Shift - 02)

- (a) 76 sq.cm (b) 64 sq.cm
(c) 58 sq.cm (d) 66 sq.cm

61. The diameter of a cycle wheel is 126 cm. A cyclist takes $16\frac{1}{2}$ minutes to reach the destination at a speed of 72 km/hr. How many revolution will the wheel make during the journey?

(Take $\pi = \frac{22}{7}$)

1 जसक तीरुदर सनसवे वंसन सै वरु सजश उरु स 2 प्र ह
1 जसक तीरुदर स एरु जसज शरु सैज 2 प्र ह सैज श

एरु सकसत री वस। जसक ह पंस 2 री 16 $\frac{1}{2}$ 12 प

ता स ह री खरु स वरु सजश स 5 स स सवे वरु
रीज। पंस ए शरु सै तश तरु स, 2 स सै री 1

$\pi = \frac{22}{7}$ अ

SSC CPO 12/12/2019 (Shift - 02)

- (a) 5000 (b) 5200
(c) 4000 (d) 4500

62. A circular wire of diameter 77 cm is bent in the form of a rectangle whose length is 142% of its breadth. What is the area of the rectangle? (Take $\pi = \frac{22}{7}$)

नरु सक 2 प्र ह वरु स सै री 1 जसक शरु सजश सजश
2 रु वरु स जस शरु स। सद पशरु स शरु वरु स कज
रु सै कज पशरु स वरु स सैज शरु स 4 प्र ह सै री सजश
नरु शरु सैज। पस्र ह

, 2 स सै री 1 स $\pi = \frac{22}{7}$ अ

SSC CPO 12/12/2019 (Shift - 02)

(a) 3520 sq.cm (b) 3450 sq.cm
(c) 3550 sq.cm (d) 3620 sq.cm
63. The sides of a triangle field are 120m, 170m. and 250m. The cost of leveling the field at the rate of Rs. 7.40/m² is:

1 जस री वरु स स 2 इ स स ज पस वरु स री 120m,
170m. स 250m. वरु स 7.40 ह स री 1 स m²
ज पस वरु स स 2 इ स स ज स 2 री स ज स स स वरु स।
ज पस 8 स स री 1 ह

SSC CPO 13/12/2019 (Shift - 01)

(a) Rs. 65,120 (b) Rs. 63,640
(c) Rs. 59,200 (d) Rs. 66,600
64. The internal length of a room is two times its breadth and three times its height. The total cost of painting its four walls at the rate of Rs. 25/m² is Rs. 3,600. What is the cost of laying a carpet on its floor at the rate of Rs. 900.50/m²?

1 जस 2 जस री री री सै री सै कज पशरु स वरु स
ज पस वरु स स वरु स कज पशरु स वरु स स वरु स स वरु स स
वरु स कज पशरु स री री री सै 25/m² ज पस वरु स
वरु स री स ज स स स वरु स सै स। स ह स 3,600. ह
900.50 ह स री 1 स m² ज पस वरु स कज स वरु स स
ज री वरु स वरु स स वरु स सै स। स ज पस 8 स
ज री 1 ह

SSC CPO 13/12/2019 (Shift - 01)

(a) Rs. 6,516 (b) Rs. 7,240
(c) Rs. 5,430 (d) Rs. 5,970
65. When the radius of a sphere is increased by 5 cm, its surface area increases by 704 cm². The diameter of the original sphere, is (Take $\pi = \frac{22}{7}$)

र द स ज स री स वरु स री 5 cm ज पस री स
र स प्र वरु स कज स वरु स स री 704 cm²
ज पस री स स री स वरु स री स री स री स
रीज। पस्र ह स, 2 स सै री 1 स $\pi = \frac{22}{7}$ अ

SSC CPO 13/12/2019 (Shift - 02)

- (a) 8.2 cm (b) 5.2 cm
(c) 6.8 cm (d) 6.2 cm

66. The sides of a triangular park are in the ratio of 12 : 17 : 25 and its perimeter is 1080 m. The area (in hectares) of the park is.

1 जस री वरु स स स स स स री री स री स पस्र
द स स स स स स स स स कज स स स स 1080
m. वरु स स स स स री स, री वरु स री स ह

SSC CPO 13/12/2019 (Shift - 02)

- (a) 3.6 (b) 4.5
(c) 4.2 (d) 4.8

67. The area (in m²) of a circular path of uniform width x meters surrounding a circular region of diameter d metres is.

d 2 री वरु स स री स ज स री स स स स स स स री स
वरु स स 2 री स स स ज क 2 स स री स स स स
वरु स स स स री स स m² 2 री ह

SSC CPO 13/12/2019 (Shift - 02)

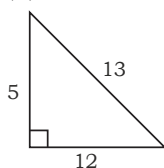
- (a) $\pi x(x + d)$ (b) $\pi x(x + 2d)$
(c) $\pi x\left(x + \frac{d}{2}\right)$ (d) $\pi x(2x + d)$

ANSWER KEY

1.(b)	2.(a)	3.(d)	4.(c)	5.(a)	6.(d)	7.(a)	8.(b)	9.(a)	10.(d)
11.(d)	12.(b)	13.(b)	14.(d)	15.(d)	16.(d)	17.(b)	18.(b)	19.(c)	20.(c)
21.(b)	22.(d)	23.(c)	24.(d)	25.(a)	26.(c)	27.(b)	28.(b)	29.(d)	30.(d)
31.(b)	32.(d)	33.(c)	34.(a)	35.(d)	36.(c)	37.(a)	38.(b)	39.(d)	40.(d)
41.(c)	42.(c)	43.(d)	44.(a)	45.(c)	46.(d)	47.(c)	48.(b)	49.(a)	50.(b)
51.(a)	52.(c)	53.(b)	54.(d)	55.(c)	56.(c)	57.(b)	58.(b)	59.(b)	60.(b)
61.(a)	62.(c)	63.(d)	64.(a)	65.(d)	66.(a)	67.(a)			

SOLUTIONS

1. (b) Given sides are (5, 12, 13)



Which are sides of a right angled triangle.

$$\text{Area} = \frac{1}{2} \times \text{base} \times \text{height}$$

$$\therefore \text{area} = \frac{1}{2} \times 12 \times 5 = 30 \text{ cm}^2$$

2. (a) Let the sides of a right angled Δ is $(5x, 12x \& 13x)$

ATQ,

$$\Rightarrow 5x + 12x + 13x = 90$$

$$\Rightarrow 30x = 90$$

$$\Rightarrow x = 3$$

$$\therefore \text{Area} = \frac{1}{2} \times \text{base} \times \text{height}$$

$$= \frac{1}{2} \times 5x \times 12x \Rightarrow 30x^2$$

= Put, the value of x

We get,

$$= 270 \text{ cm}^2$$

3. (d) Let side of equilateral triangle is ' a ' cm

Area of equilateral triangle

$$= \frac{\sqrt{3}}{4} \times a^2$$

ATQ,

$$\frac{\sqrt{3}}{4} a^2 = 4\sqrt{3} \Rightarrow a = 4 \text{ cm}$$

4. (c) Given, $l = 126 \text{ ft.}$ $b = 90 \text{ ft.}$

HCF (l, b) = 18

$$\therefore \text{Area of tiles} = 18 \times 18$$

$$= 324 \text{ ft}^2$$



SMART APPROACH:-

Now, this type of questions we solve go through by digital sum

Area of rectangular hall = $l \times b$

$$= 126 \times 90 \Rightarrow 11340$$

Digital sum = 9

Now check the option (c)

324 = 9 (digital sum)

Hence, option (c) is correct.

5. (a) Let, the side of equilateral triangle is ' a ' cm

Then, ATQ

$$\frac{\sqrt{3}}{4} a^2 = \frac{1.732}{4} \times a^2 = 173.2$$

$$\Rightarrow a^2 = 100 \times 4$$

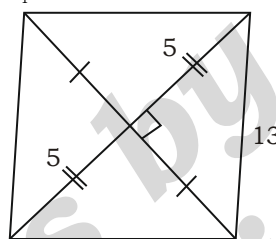
$$\Rightarrow a = 20 \text{ cm}$$

6. (d) Perimeter of rhombus

$$= 4a \Rightarrow 52$$

$$\Rightarrow a = 13 \text{ cm}$$

$$d_1 = 10 \text{ cm}$$



$$\Rightarrow d_2 = (\sqrt{13^2 - 5^2}) \times 2$$

$$= 24 \text{ cm}$$

$$\therefore \text{area of rhombus} = \frac{1}{2} \times d_1 \times d_2$$

$$= \frac{1}{2} \times 10 \times 24 = 120 \text{ cm}^2$$

7. (a) Given,

$$r = 8 \text{ cm, } l = 4.6 \text{ cm}$$



We know that,

$$\text{Area of sector} = \frac{lr}{2}$$

$$= \frac{1}{2} \times 4.6 \times 8$$

$$= 18.4 \text{ cm}^2$$

8. (b) $r = 1.75 \text{ cm}$

circumference of circle = $2\pi r$

$$2\pi r = 2 \times \frac{22}{7} \times 1.75$$

$$= 44 \times 0.25$$

$$= 11 \text{ cm}$$

9. (a) Given, Area of rectangular field = 480 m^2

After increase 20%

$$b = \frac{5}{6} l$$

$$l \times b = 480$$

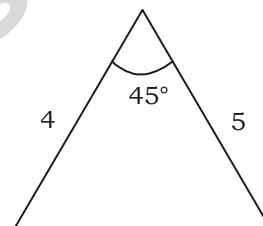
$$\text{Then, } l \times \frac{5l}{6} = 480$$

$$l^2 = \frac{480 \times 6}{5} \Rightarrow 96 \times 6$$

$$l^2 = 576$$

$$\Rightarrow l = 24 \text{ m}$$

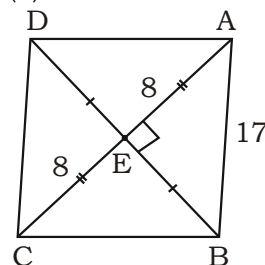
10. (d)



$$\text{Area} = \frac{1}{2} \times 5 \times 4 \times \sin 45^\circ$$

$$= 10 \times \frac{1}{\sqrt{2}} = 5\sqrt{2} \text{ cm}^2$$

11. (d)



$$EB = \sqrt{17^2 - 8^2}$$

$$= 15$$

$$\therefore d_1 = 16, d_2 = 30$$

$$\text{Area} = \frac{1}{2} \times 16 \times 30$$

$$= 240 \text{ cm}^2$$

12. (b)

Given, circumference of circle = 13.2 cm

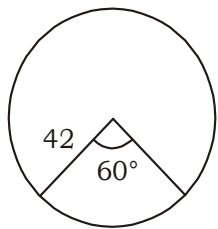
ATQ,

$$2\pi r = 13.2$$

$$r = 13.2 \times \frac{7}{22} \times \frac{1}{2}$$

$$= 2.1 \text{ cm}$$

13. (b)



We know that,

$$\frac{60^\circ}{360^\circ} \times 2\pi r = l$$

$$\Rightarrow \frac{2}{6} \times \frac{22}{7} \times 42 = l$$

$$\Rightarrow l = 44 \text{ cm}$$

14. (d) Let, $l = 3x$, $b = 8x$

$$\text{Area} = 24x^2 = 1944$$

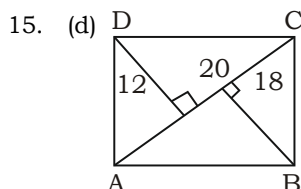
$$\Rightarrow x^2 = 81$$

$$x = 9$$

$$\therefore l = 27, b = 72$$

$$\text{Perimeter} = 2(l + b) = 2 \times 99$$

$$= 198 \text{ cm}$$



Area of quadrilateral = area of triangles ABC and ADC

$$= \left(\frac{1}{2} \times 20 \times 12 \right) + \left(\frac{1}{2} \times 18 \times 20 \right)$$

$$= 10 \times 30 = 300 \text{ m}^2$$

16. (d) Length of arc = $\frac{\theta}{360} \times 2\pi r$

$$\Rightarrow 2r = \frac{\theta}{360} \times 2\pi r$$

$$\Rightarrow \theta = \frac{360}{\pi}$$

Now, Area of sector OAB

$$= \frac{\theta}{360} \times \pi r^2 = \frac{360}{\pi} \times \frac{1}{360} \times \pi r^2 = r^2$$



SMART APPROACH:-

Given that
Radius = r , length of arc = $2r$
We know,
Area of arc = $\frac{1}{2} \times \text{length of arc} \times \text{radius}$
Then,
Area of arc = $\frac{1}{2} \times 2r \times r = r^2$

17. (b) Perimeter of sector

$$= \frac{\theta}{360} \times 2\pi r + 2r$$

$$\text{Angle of Major Sector} = 360^\circ - 75^\circ$$

$$= 285^\circ$$

Perimeter of Major Sector

$$= \frac{285}{360} \times 2\pi \times 12 + 2 \times 12$$

$$= 19\pi + 24 \text{ meter}$$

18. (b) Formula used, volume of cuboid = length $\times$ breadth $\times$ height
Area of rectangular field = length $\times$ breadth

$$= 90 \times 75 = 6750 \text{ sq. m}$$

$$\text{Area of pit} = 18 \times 15 = 270 \text{ sq. m}$$

Remaining area of the field where the earth has to spreaded over

$$= 6750 - 270 = 6480 \text{ m}^2$$

Volume of the earth = Volume of pit

$$\Rightarrow \text{Remaining Area} \times h = 18 \times 15 \times 6$$

$$\Rightarrow 6480 \times h = 1620$$

$$\Rightarrow h = 0.25 \text{ m}$$

Rise in the level of the earth

$$= 25 \text{ cm}$$

19. (c) Perimeter of square

= Perimeter of rectangle

$$\Rightarrow 4 \times \text{side} = 2(\text{Length} + \text{Breadth})$$

$$\Rightarrow 4 \times \text{side} = 2(10 + 8)$$

$$\Rightarrow 4 \times \text{side} = 36$$

$$\Rightarrow \text{side} = 9 \text{ cm}$$

$$\therefore \text{Area of square} = \text{side}^2 = 9^2 = 81 \text{ cm}^2$$

20. (c) Factor of $62 = 2 \times 31$

$$\text{Factor of } 186 = 2 \times 3 \times 31$$

$$\text{Factor of } 279 = 3 \times 3 \times 31$$

$$\text{HCF} = 31 \text{ m}$$

21. (b) Let the diameter of blue semi-circle = 6 units

$\therefore$ Radius of blue semi-circle = 3 units

Diameter of red semi-circle

$$= \frac{6}{3} = 2 \text{ units}$$

$\therefore$ Radius of red semi-circle = 1 unit

Ratio between red and blue area is

$$= 3 \times \frac{1}{2} \pi (1)^2 : \left\{ \frac{\pi}{2} (3)^2 - 3 \times \frac{1}{2} \pi (1)^2 \right\}$$

$$= 3\pi : 6\pi = 1 : 2$$

22. (b) Length of longest pole

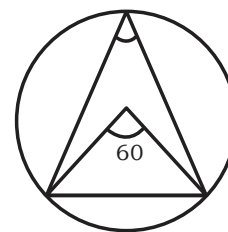
$$= \sqrt{l^2 + b^2 + h^2}$$

$$= \sqrt{(60)^2 + (30)^2 + (20)^2}$$

$$= \sqrt{3600 + 900 + 400}$$

$$= \sqrt{4900} = 70 \text{ feet}$$

23. (c)



If chord length is equal to radius of circle, the formed Δ will be equilateral.

Angle subtended by the chord in

$$\text{major segment} = \frac{60^\circ}{2} = 30^\circ$$

24. (d) Area of circle = πr^2

$$\Rightarrow 1386 = \frac{22}{7} \times r^2$$

$$\Rightarrow r^2 = \frac{1386 \times 7}{22}$$

$$\Rightarrow r^2 = 441$$

$$\Rightarrow r = 21 \text{ cm}$$

25. (a) Area of sector = $\frac{\theta}{360} \times \pi r^2$

$$\Rightarrow 128 = \frac{\theta}{360} \times \pi r^2 \dots\dots(1)$$

$$\text{Arc length} = \frac{\theta}{360} \times 2\pi r$$

$$\Rightarrow 64 = \frac{\theta}{360} \times 2\pi r \dots\dots(2)$$

On dividing (1) by (2), we get:

$$\Rightarrow 2 = \frac{r}{2}$$

$$\Rightarrow r = 4 \text{ cm}$$



SMART APPROACH:-

Given that
Area of arc = 128 cm^2 , length of arc = 64 cm
We know,
 $128 = \frac{1}{2} \times 64 \times r$
 $r = 4 \text{ cm}$

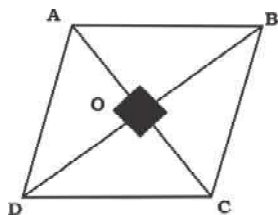
26. (c) Length of arc = $\frac{\theta}{360} \times 2\pi r$

$$\Rightarrow 19 = \frac{\theta}{360} \times 2 \times \frac{22}{7} \times 30$$

$$\Rightarrow \theta = \frac{19 \times 360 \times 7}{2 \times 22 \times 30}$$

$$= \frac{47880}{1320} = 36.27^\circ$$

27. (b) Given,



Perimeter = $4P$

Sum of diagonals = L

In Rhombus ABCD

$$AB = BC = CD = DA = \frac{4P}{4} = P$$

We know that, diagonals of rhombus bisect each other at 90° .

$$OA = OC = \frac{AC}{2}$$

$$OB = OD = \frac{BD}{2}$$

In $\triangle AOB$,

$$OA^2 + OB^2 = AB^2$$

$$\Rightarrow \left(\frac{AC}{2}\right)^2 + \left(\frac{BD}{2}\right)^2 = AB^2$$

$$\Rightarrow \left(\frac{AC}{2}\right)^2 + \left(\frac{BD}{2}\right)^2 = P^2$$

$$\Rightarrow AC^2 + BD^2 = 4P^2 \quad \dots (1)$$

Again,

$$AC + BD = L$$

squaring both sides

$$\Rightarrow (AC + BD)^2 = L^2$$

$$\Rightarrow AC^2 + BD^2 + 2AC \cdot BD = L^2$$

From eqn(1)

$$\Rightarrow 4P^2 + 2AC \cdot BD = L^2$$

$$\Rightarrow 2AC \cdot BD = L^2 - 4P^2$$

$$\Rightarrow AC \cdot BD = \frac{1}{2}(L^2 - 4P^2)$$

Area of rhombus ABCD

$$= \frac{1}{2} \times AC \times BD$$

$$= \frac{1}{2} \times \frac{1}{2}(L^2 - 4P^2) = \frac{1}{4}(L^2 - 4P^2)$$



SMART APPROACH:-

Given that,
 $d_1 + d_2 = L$ perimeter of rhombus $4P$
 then,
 side of rhombus = P
 then,
 $d_1^2 + d_2^2 = 4P^2$
 we know,
 $(d_1 + d_2)^2 = d_1^2 + d_2^2 + 2d_1 d_2$
 $d_1 d_2 = \frac{1}{2}(L^2 - 4P^2)$
 Then,
 Area of rhombus = $\frac{1}{4}(L^2 - 4P^2)$

28. (b) Length of the longest rod

$$= \sqrt{l^2 + b^2 + h^2} = \sqrt{12^2 + 9^2 + 8^2}$$

$$= \sqrt{144 + 81 + 64} = \sqrt{289} = 17\text{m}$$

29. (d) Given,

$$L = 10\text{ m}$$

$$B = 5\text{ m}$$

$$H = 6\text{ m}$$

Area of hall to be painted excluding surface

$$= 2(l + b)h + l \times b$$

$$= 2(10 + 5)6 + 10 \times 5 = 180 + 50 = 230\text{m}^2$$

30. (d) Let the sides of triangle be

$$a = 10\text{ cm}$$

$$b = 12\text{ cm}$$

$$c = 18\text{ cm}$$

$$\text{Semi-Perimeter, } S = \frac{a + b + c}{2}$$

$$= \frac{10 + 12 + 18}{2} = 20\text{ cm}$$

$$\text{Area of } \Delta = \sqrt{S(S-a)(S-b)(S-c)}$$

$$= \sqrt{20(20-10)(20-12)(20-18)}$$

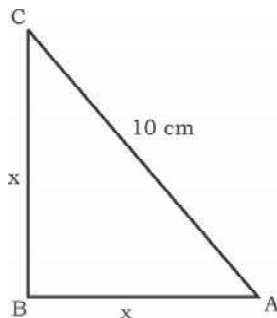
$$= \sqrt{20 \times 10 \times 8 \times 2}$$

$$= 40\sqrt{2}\text{ cm}^2$$

31. (b) Area of $\Delta = \frac{1}{2} \times \text{Base} \times \text{Height}$

$$= \frac{1}{2} \times 15 \times 6 = 45\text{ cm}^2$$

32. (d) Let the two equal sides of $\triangle ABC$ AB and BC be x cm.



By the pythagorean theorem,

$$AB^2 + BC^2 = AC^2$$

$$\Rightarrow x^2 + x^2 = 10^2$$

$$\Rightarrow 2x^2 = 100$$

$$\Rightarrow x^2 = 50$$

$$\Rightarrow x = 5\sqrt{2}$$



SMART APPROACH:-

Equal sides of isosceles right angle triangle

$$= \frac{\text{hypotenuse}}{\sqrt{2}}$$

$$= \frac{10}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = 5\sqrt{2}\text{ cm}$$

33. (c) Given,

$$s - a = 18\text{ cm}$$

$$s - b = 17\text{ cm}$$

$$s - c = 25\text{ cm}$$

On adding

$$\Rightarrow 3s - (a + b + c) = 60$$

$$\Rightarrow 3s - 60 = a + b + c$$

We know that,

$$s = \frac{a + b + c}{2}$$

$$\Rightarrow s = \frac{3s - 60}{2}$$

$$\Rightarrow 2s = 3s - 60$$

$$\Rightarrow s = 60$$

Area of Δ

$$= \sqrt{s(s-a)(s-b)(s-c)}$$

$$= \sqrt{60 \times 18 \times 17 \times 25} = 30\sqrt{510}\text{ cm}^2$$

34. (a) If length of rectangle = $3x$
 Breadth of a rectangle

$$= 3x \times \frac{2}{3} = 2x$$

Perimeter of a rectangle

= Perimeter of a square

$$2(3x + 2x) = 40$$

$$5x = 20$$

$$x = 4$$

$$\text{Length} = 3x = 12\text{ m}$$

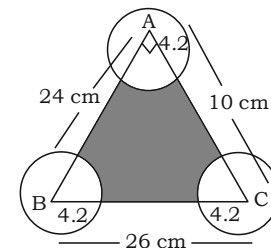
$$\text{Breadth} = 2x = 8\text{ m}$$

Area of a rectangle

= Length $\times$ Breadth

$$= 12 \times 8 = 96\text{ m}^2$$

35. (d)



$\therefore \triangle BAC$ is a right angle triangle-

$$26^2 = 24^2 + 10^2$$

radius of each circle = 4.2 cm

Area of sectorian circles -

$$= \frac{180^\circ}{360^\circ} \pi r^2$$

[$\because$ a triangle is always 180°]

$$= \frac{1}{2} \times \frac{22}{7} \times 4.2 \times 4.2$$

$$= 27.72 \text{ cm}^2$$

$$\text{Area of } \triangle ABC = \frac{1}{2} \times BA \times AC$$

$$= \frac{1}{2} \times 24 \times 10 = 120 \text{ cm}^2$$

$$\text{Area of remaining region}$$

$$= 120 - 27.72 = 92.28 \text{ cm}^2$$



SMART APPROACH:-

Sides of triangle is 10cm, 24cm and 26cm

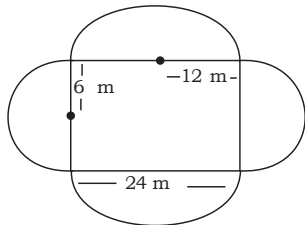
(10, 24, 26) is triplate

$\therefore$ Area of remaining region
= area of triangle - area of sectorian circles

$$\Rightarrow \frac{1}{2} \times 10 \times 24 - \frac{1}{2} \times \frac{22}{7} \times 4.2 \times 4.2$$

$$= 92.28 \text{ cm}^2$$

36. (c)



$$\text{Area of rectangle} = 12 \times 24 = 288 \text{ m}^2$$

$$\text{Area of circular portion of lawn}$$

$$= \pi \times 12^2 + \pi \times 6^2$$

$$= 3.14 \times (144 + 36)$$

$$= 3.14 \times 180 = 565.2 \text{ m}^2$$

$$\text{Total area of the lawn}$$

$$= 288 + 565.2 = 853.2 \text{ m}^2$$

$$\text{Total cost} = 853.2 \times \text{Rs.}100$$

$$= \text{Rs. } 85320$$

37. (a) A Wheel covered distance in one revolution = $2\pi r$

A wheel covered total in 12 revolution = $12 \times 2\pi r$

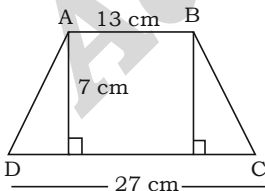
$$= 2r = 42 \text{ cm}$$

$$r = 21 \text{ cm}$$

$$= 12 \times 2 \times \frac{22}{7} \times 21$$

$$= 24 \times 66 = 1584 \text{ cm} = 15.84 \text{ m}$$

38. (b)



$$\text{Area of the trapezium} -$$

$$= \frac{1}{2} \times (13 + 27) \times 7 = 140 \text{ cm}^2$$

$$= \frac{140}{10000} \text{ m}^2 = 0.014 \text{ m}^2$$

39. (d) Area of the trapezium -

$$= \frac{1}{2} \times (17 + 15) \times 6$$

$$= 96 \text{ cm}^2$$

$$= 0.0096 \text{ m}^2$$

40. (d) $\therefore$ Area of a hexagon

$$= 6 \times \frac{\sqrt{3}}{4} \times (\text{side})^2$$

$$= 6 \times \frac{\sqrt{3}}{4} \times a^2 = 1944 \sqrt{3} \quad (a = \text{side})$$

$$a^2 = \frac{1944 \times 4}{6}$$

$$a^2 = 324 \times 4$$

$$a = 36 \text{ m}$$

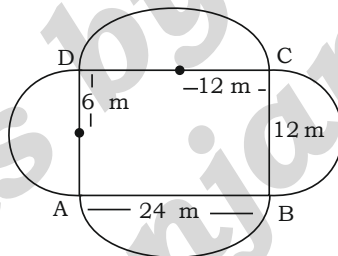
Perimeter of the hexagon

$$= 6 \times 36 = 216 \text{ m}$$

$$\text{Total cost} = 216 \times 11.5 = 108 \times 23$$

$$= \text{Rs.}2484$$

41. (c)



$$\text{Area of rectangle} = 12 \times 24 = 288 \text{ m}^2$$

$$\text{Ar. of circular portion of the lawn}$$

$$= \pi \times 12^2 + 6^2 \times \pi$$

$$= 3.14 \times (144 + 36)$$

$$= 3.14 \times 180$$

$$= 565.2 \text{ m}^2$$

$$= 565.2 \text{ m}^2$$

$$\text{Total area of the lawn}$$

$$= 288 + 565.2 = 853.2 \text{ m}^2$$

42. (c) Side of square = a

$$\text{diagonal} = a\sqrt{2}$$

$$a\sqrt{2} = 6\sqrt{2}$$

$$a = 6 \text{ cm}$$

$$\text{Perimeter of square} = 4 \times 6 = 24 \text{ cm}$$

$$\text{Base of triangle} = 24 \text{ cm}$$

$$\text{Height of triangle} = ?$$

$\therefore$ Height of triangle is equal to side of that square whose's area is 144 cm^2

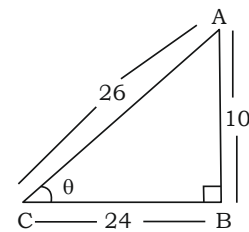
$$\text{Side} = 12 \text{ cm}$$

$$\text{Triangle's height} = 12 \text{ cm}$$

$$\text{Ar of triangle} = \frac{1}{2} \times \text{Base} \times \text{height}$$

$$= \frac{1}{2} \times 24 \times 12 = 144 \text{ cm}^2$$

43. (d)



$$\text{Perimeter} = 60 \text{ cm}$$

$$AB + BC = 60 - 26 = 34 \text{ cm}$$

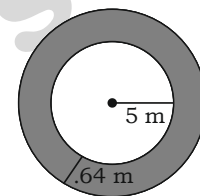
By hit and trial -

$$\text{One side} = 24 \text{ cm}$$

$$\text{Second side} = 10 \text{ cm}$$

$$\text{Area of triangle} = \frac{1}{2} \times 24 \times 10 = 120 \text{ cm}^2$$

44. (a)



$$r = 5 \text{ m}$$

$$= \pi(5.64^2 - 5^2)$$

$$= \frac{22}{7} \times 10.64 \times .64$$

$$= 22 \times 1.52 \times .64$$

$$\Rightarrow 21.4016 = 21 \text{ m}^2$$

45. (c) Length of the rectangle = $3x$

$$\text{Breadth of the rectangle} = 3x \times$$

$$\frac{2}{3} = 2x$$

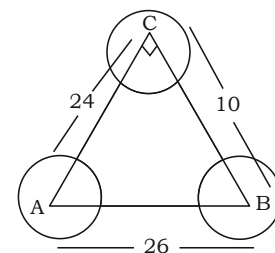
$$\therefore (3x + 2x) = 40$$

$$x = 8 \text{ m}$$

$$\text{Area of the rectangle } 3x \times 2x = 6x^2$$

$$= 6 \times 64 = 384 \text{ m}^2$$

46. (d)



$$\text{Radii of each circle} = 4.2 \text{ cm}$$

$\therefore \triangle ABC$ is a right angle triangle

$$26^2 = 24^2 + 10^2$$

Total area of sectorial circles –

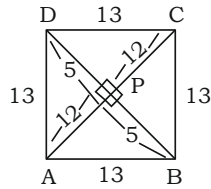
$$= \frac{180^\circ}{360^\circ} \pi r^2$$

[$\therefore$ A triangle is always 180°]

$$= \frac{1}{2} \times \frac{22}{7} \times 4.2 \times 4.2$$

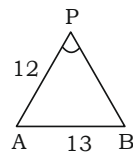
$$= 27.72 \text{ cm}^2$$

47. (c)



In a rhombus, two diagonals intersect each other on 90° in equal parts

In $\triangle APB$ –



$$PB = \sqrt{13^2 - 12^2} = 5 \text{ cm}$$

Area of a rhombus

$$= \frac{1}{2} \times AC \times BD$$

$$= \frac{1}{2} \times 24 \times 10 = 120 \text{ cm}^2$$

48. (b)

Side of square = a

diagonal = $a\sqrt{2}$

$$a\sqrt{2} = 9\sqrt{2}$$

$$a = 9 \text{ cm}$$

Perimeter of square = $4 \times 9 = 36 \text{ cm}$

Base of triangle = 36 cm

$\therefore$ Height of triangle is equal to side of that square whose's area is 144 cm^2

Side = 12 cm

Height of the triangle = 12 cm

Area of the triangle

$$= \frac{1}{2} \times \text{Base} \times \text{height}$$

$$= \frac{1}{2} \times 36 \times 12 = 216 \text{ cm}^2$$

49. (a)

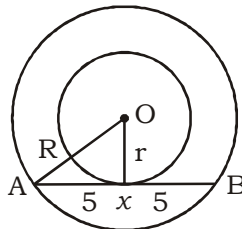
Each side of an equilateral $\triangle$

= 12 cm

Altitude

$$= \frac{\sqrt{3}a}{2} = \frac{\sqrt{3} \times 12}{2} = 6\sqrt{3} \text{ cm}$$

50. (b)



$AB = 10 \text{ cm}$ (given)

$$AX = \frac{10}{2} = 5 \text{ cm}$$

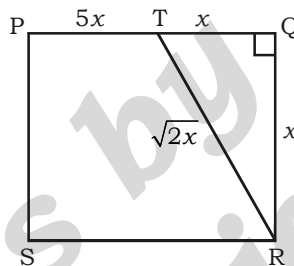
$$R^2 = r^2 + 25$$

Area of the annulus portion between two circle

$$= \pi(R^2 - r^2)$$

$$= \pi(25) = 25\pi$$

51. (a)



A.T.Q,

Given that,

$$PT : QT = 5 : 1$$

$$\text{Area of } \triangle RTQ = \frac{1}{2} \times x \times x = 12\sqrt{3}$$

$$\Rightarrow x^2 = 24\sqrt{3}$$

Then,

$$\text{Area of } \square PQRS = 6x \times x = 6x^2$$

$$= 6 \times 24\sqrt{3} = 144\sqrt{3} \text{ cm}^2$$

52. (c) Two parallel sides of a trapezium are 27 cm and 13 cm height = 8 cm

$$\text{Area} = \frac{1}{2}(a+b) \times h$$

$$= \frac{1}{2}(27+13) \times 8$$

$$= \frac{1}{2} \times 40 \times 8 = 160 \text{ cm}^2 = 0.016 \text{ m}^2$$

53. (b) We know,

$$S (\text{Semi perimeter}) = \frac{a+b+c}{2}$$

$$\text{Area of } \triangle = \sqrt{S(S-a)(S-b)(S-c)}$$

$$S = \frac{60+112+164}{2} = \frac{336}{2} = 168$$

Area of $\triangle$

$$= \sqrt{168(168-60)(168-112)(168-164)}$$

$$= \sqrt{168 \times 108 \times 56 \times 4}$$

$$= 2016 \text{ m}^2$$

Cost of levelling the park = Rs. $8.5/\text{m}^2$

Cost of levelling of 2016 m^2 of the park

$$= 2016 \times 8.5 = 17136$$

54. (d) $2\pi r - 2r = 60$

$$= 2r(\pi - 1) = 60$$

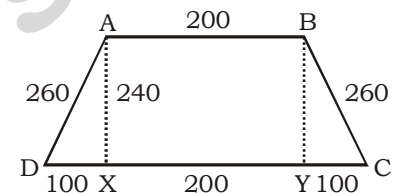
$$= 2r \left(\frac{22}{7} - 1 \right) = 60$$

$$= r = 14$$

$$\text{Area of circle} = \pi r^2 = \frac{22}{7} \times 14 \times 14$$

$$= 616 \text{ cm}^2$$

55. (c)



A.T.F

$$AX = 120 \times 2 = 240$$

Then,

$$\text{Area of trapezium} = \frac{1}{2} \times (600) \times$$

$$240 = 72000 \text{ m}^2$$

56. (c) Radius of park = $\frac{210}{2} = 105 \text{ m}$

Radius of park and path combine = $(105 + 5) = 110$

Area of path = $\pi(R^2 - r^2)$

$$= \pi((110)^2 - (105)^2)$$

$$= \pi((110 + 105)(110 - 105))$$

$$= \pi \times 215 \times 5$$

$$= 1075\pi \text{ m}^2$$

57. (b) $S = \frac{(35+53+66)}{2} = 77 \text{ m}$

$$\text{Area of } \triangle = \sqrt{S(S-a)(S-b)(S-c)}$$

$$= \sqrt{77 \times 42 \times 24 \times 11}$$

$$= 11 \times 7 \times 6 \times 2 = 924 \text{ m}^2$$

Costing of leveling of $924 \text{ m}^2 = 924 \times 9.25 = \text{Rs. } 8547$

58. (b) Total length of fencing = $\frac{2640}{12}$

$$= 220 \text{ m}$$

perimeter = 220

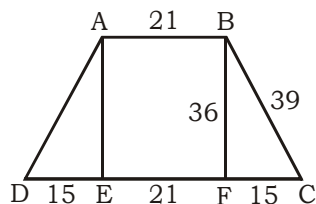
$$2\pi r = 220$$

$$r = 35$$

$$\text{Area of circle} = r^2 = \frac{22}{7} \times 35 \times 35$$

$$= 3850$$

59. (b)

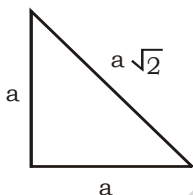


$$\text{Area of trapezium} = \frac{1}{2} (a + b) \times h$$

$$= \frac{1}{2} (21 + 51) \times 36$$

$$= \frac{1}{2} \times 72 \times 36 = 1296 \text{ cm}^2$$

60. (b) Given, Perimeter = $16\sqrt{2} + 16$ cm



We know,

Perimeter of Isosceles Δ

$$= a\sqrt{2} (\sqrt{2} + 1)$$

$$\Rightarrow a\sqrt{2} (\sqrt{2} + 1) = 16\sqrt{2} + 16$$

$$\Rightarrow a = 8\sqrt{2}$$

$$\text{Area of triangle} = \frac{1}{2} \times a^2$$

$$= \frac{1}{2} \times 8\sqrt{2} \times 8\sqrt{2} = 64 \text{ cm}^2$$

61. (a) Distance Covered = $S \times T$

$$= 72 \times \frac{100000}{60} \times \frac{33}{2}$$

$$= 1980000 \text{ cm}$$

Distance covered by wheel in 1

$$\text{revolution} = \pi d = \frac{22}{7} \times 126 = 396 \text{ cm}$$

$\therefore$ Number of revolutions

$$= \frac{1980000}{396} = 5000 \text{ rev.}$$

62. (c)

Diameter of circle = 77 cm

Circumference of circle = πd

$$= \frac{22}{7} \times 77 = 242 \text{ cm}$$

$$\text{We know, } 142\% = \frac{71}{50}$$

Let Rectangle's Breadth = $50x$

Rectangle's Length = $71x$

ATQ, Perimeter = $2(l + b)$

$$\Rightarrow 2(l + b) = 242$$

$$\Rightarrow 2(71x + 50x) = 242$$

$$\Rightarrow 121x = 121$$

$$\Rightarrow x = 1$$

Area of rectangle = $l \times b$

$$= 71x \times 50x = 71 \times 1 \times 50 \times 1$$

$$= 3550 \text{ cm}^2$$

63. (d) Given, $a = 120$ cm, $b = 170$ cm, $c = 250$ cm.

We know,

$$S = \frac{a + b + c}{2} = \frac{120 + 170 + 250}{2} = 270 \text{ m}$$

$$\text{ar}\Delta = \sqrt{S(S-a)(S-b)(S-c)}$$

$$= \sqrt{270 \times 150 \times 100 \times 20}$$

$$= 9000 \text{ m}^2$$

Costing of levelling the field at the rate of Rs 7.40/m²

$$= 9000 \times 7.40$$

$$= \text{Rs. } 66600$$

64. (a) L B H

$$6x \quad 3x \quad 2x$$

Cost of painting its four wall at the rate of Rs 25/m² is Rs 3600

$$= 2(l + b) \times h \times 25 = 3600$$

$$= 2 \times 9x \times 2x \times 25 = 3600$$

$$= x = 2$$

$$l = 6 \times 2 = 12 \text{ m}$$

$$b = 3 \times 2 = 6 \text{ m}$$

Cost of laying a carpet on its floor at the rate of Rs. 90.50/m²

$$= (\text{Area of floor}) \times 90.50$$

$$= 72 \times 90.50 = \text{Rs. } 6516$$

65. (d) Surface area = $4\pi r^2$

New Radius = $r + 5$

$$\text{ATQ, } 4\pi(r + 5)^2 - 4\pi r^2 = 704$$

$$\Rightarrow 4\pi [(r + 5)^2 - r^2] = 704$$

$$\Rightarrow 4 \times \frac{22}{7} [r^2 + 25 + 10r - r^2] = 704$$

$$\Rightarrow 25 + 10r = 704 \times \frac{7}{22} \times \frac{1}{4}$$

$$\Rightarrow 25 + 10r = 56$$

$$\Rightarrow 10r = 56 - 25 = 31$$

$$\Rightarrow r = 3.1$$

$$\text{Diameter} = 2 \times 3.1 = 6.2 \text{ cm}$$

66. (a) Ratio of side of $\Delta = 12x : 17x : 25x$

Perimeter of the triangle = 1080

$$\Rightarrow 12x + 17x + 25x = 1080$$

$$\Rightarrow 54x = 1080$$

$$\Rightarrow x = 20$$

Sides of the triangle are

$$12 \times 20 = 240$$

$$17 \times 20 = 340$$

$$25 \times 20 = 500$$

$$S = \frac{(240 + 340 + 500)}{2} = \frac{1080}{2}$$

$$= 540$$

Area of triangle

$$= \sqrt{S(S-a)(S-b)(S-c)}$$

$$= \sqrt{540 \times 300 \times 200 \times 40}$$

$$= 36000 \text{ m}^2$$

$$10000 \text{ m}^2 = 1 \text{ Hectares}$$

$$36000 \text{ m}^2 = 3.6 \text{ hectares}$$

67. (a) Radius of circular region = $\frac{d}{2}$

Width of path = x m

External radius of path (R)

$$= \frac{d}{2} + x$$

Area of path = $\pi (R^2 - r^2)$

$$= \pi \left[\left(\frac{d}{2} + x \right)^2 - \left(\frac{d}{2} \right)^2 \right]$$

$$= \left[\frac{d^2}{4} + x^2 + dx - \frac{d^2}{4} \right] = \pi [x^2 + dx]$$

$$= \pi x (x + d) \text{ m}^2$$



MENSURATION-3D

22

प्रश्नशाला अभ्यास

1. If the height of a cone is 7 cm and the diameter of the circular base is 12 cm, then its volume is (nearest to integer):

यदि किसी शीर्षक की ऊँचाई 7 से.मी. है और उसके गोलाकार आधार का व्यास 12 से.मी. है, तो इसका आयतन (पूर्णांक के निकटतम) क्या होगा?

SSC CPO 03/10/2023 (Shift-01)

- (a) 264 cm^3 (b) 284 cm^3
(c) 274 cm^3 (d) 254 cm^3

2. The radii of the ends of a frustum of a solid right-circular cone 45 cm high are 28 cm and 7 cm. If this frustum is melted and reconstructed into a solid right circular cylinder whose radius of base and height are in the ratio 3: 5, find the curved surface area (in cm^2) of this cylinder.

$$\left[\text{Use } \pi = \frac{22}{7} \right]$$

एक ठोस दायाँ गोलाकार शीर्षक की ऊँचाई 45 से.मी. है और उसके दो समांतर गोलाकार अंतःफलक के त्रिज्याएँ 28 से.मी. और 7 से.मी. हैं। यदि इस शीर्षक को पिघलाया जाये और इसे एक ठोस दायाँ गोलाकार बेलन में पुनर्निर्मित किया जाये, जिसकी आधार त्रिज्या और ऊँचाई का अनुपात 3:5 हो, तो इस बेलन की वक्रतल क्षेत्रफल (चौ.से.मी. में) क्या होगा?

$$\pi = \frac{22}{7}$$

SSC CPO 03/10/2023 (Shift-01)

- (a) 4610 (b) 4620
(c) 4640 (d) 4680

3. The cost of painting the total surface area of a 30 m high solid right circular cylinder at the rate of 25 per m^2 is ₹18,425. What is the volume (in m^3) of this

$$\text{cylinder} \left[\text{Use } \pi = \frac{22}{7} \right] ?$$

एक ठोस दायाँ गोलाकार बेलन की ऊँचाई 30 मी. है और इसकी कुल तल क्षेत्रफल को 25 रुपये प्रति m^2 की दर पर पेंट किया गया है, जिसकी कुल लागत ₹18,425 है। इस बेलन का आयतन (चौ.से.मी. में) क्या होगा?

एक ठोस दायाँ गोलाकार शीर्षक की ऊँचाई 7 से.मी. है और उसके गोलाकार आधार का व्यास 12 से.मी. है, तो इसका आयतन (पूर्णांक के निकटतम) क्या होगा?

$$\pi = \frac{22}{7}$$

SSC CPO 03/10/2023 (Shift-02)

- (a) 1210 (b) 1155
(c) 1145 (d) 1122

4. What will be the difference between the total surface area and the curved surface area of a hemisphere having 4 cm diameter? पी प्रतने की कुल क्षेत्रफल और वक्रतल क्षेत्रफल के बीच का अंतर क्या होगा, यदि उस गोलार्ध का व्यास 4 से.मी. है?

SSC CPO 03/10/2023 (Shift-02)

- (a) $4.4\pi \text{ cm}^2$ (b) $5\pi \text{ cm}^2$
(c) $4\pi \text{ cm}^2$ (d) $8\pi \text{ cm}^2$

5. A conical shape vessel has a radius of 21 cm and has a slant height of 25 cm. If the curved part of the vessel is to be painted white, find the cost (in Rs.) of painting at the rate of Rs. 1.5 per cm^2 .

एक शीर्षक के आकार का बर्तन 21 से.मी. त्रिज्या और 25 से.मी. तल ऊँचाई का है। यदि बर्तन के वक्रतल भाग को सफेद रंग में पेंट किया जाये, तो इसका खर्च (रु.) क्या होगा, यदि पेंट की दर रु. 1.5 प्रति cm^2 हो?

SSC CPO 03/10/2023 (Shift-02)

- (a) 2475 (b) 825
(c) 1680 (d) 1250

6. Find the curved surface area of a cone whose base radius is 7 cm and slant height is 10 cm is:

एक शीर्षक की वक्रतल क्षेत्रफल ज्ञात करें, जिसकी आधार त्रिज्या 7 से.मी. है और तल ऊँचाई 10 से.मी. है।

SSC CPO 03/10/2023 (Shift-02)

- (a) 280 cm^2 (b) 300 cm^2
(c) 220 cm^2 (d) 250 cm^2

7. The volume of a right circular cone having a base diameter of 14 cm is $196\pi \text{ cm}^3$. Find the perpendicular height of this cone

एक ठोस दायाँ गोलाकार शीर्षक की ऊँचाई 7 से.मी. है और उसके गोलाकार आधार का व्यास 12 से.मी. है, तो इसका आयतन (पूर्णांक के निकटतम) क्या होगा?

SSC CPO 03/10/2023 (Shift-02)

- (a) 8 cm (b) 14 cm
(c) 10 cm (d) 12 cm

8. A solid sphere made of wax of radius 12 cm is melted and cast into solid hemispheres of radius 4 cm each. Find the number of such solid hemispheres.

एक ठोस गोलार्ध के आकार का मोम का गोला 12 से.मी. त्रिज्या का है। इसे पिघलाया जाये और इसे त्रिज्या 4 से.मी. के ठोस गोलार्धों में ढाला जाये। ऐसे ठोस गोलार्धों की संख्या क्या होगी?

SSC CPO 03/10/2023 (Shift-3)

- (a) 14 (b) 54
(c) 28 (d) 27

9. Find the total surface area of a sphere whose volume is $\frac{256}{3}\pi \text{ cm}^3$.

एक गोले की कुल तल क्षेत्रफल ज्ञात करें, जिसका आयतन $\frac{256}{3}\pi \text{ cm}^3$ है।

SSC CPO 04/10/2023 (Shift-01)

- (a) $48\pi \text{ cm}^2$ (b) $64\pi \text{ cm}^2$
(c) $38\pi \text{ cm}^2$ (d) $56\pi \text{ cm}^2$

10. If the radius of a hemispherical balloon increases from 4 cm to 7 cm as air is pumped into it, find the ratio of the surface area of the new balloon to its original.

यदि एक गोलार्ध के आकार के गुब्बारे की त्रिज्या 4 से.मी. से 7 से.मी. तक बढ़ेगी, तो नए गुब्बारे की तल क्षेत्रफल और मूल गुब्बारे की तल क्षेत्रफल का अनुपात क्या होगा?

SSC CPO 04/10/2023 (Shift-01)

- (a) 20 : 49 (b) 16 : 21
(c) 49 : 16 (d) 21 : 12

11. The total surface area of a square-based right pyramid is 1536 m^2 , of which 37.5% is the area of the base of the pyramid. What is the volume (in m^3) of this pyramid?

शी ब०ह हे चद ह केमी पती के ह०गी श ह
श जी पम०, ह०ह. वी इ 25जी तनी र्णी कपवर
प्री 5। व०टी के ह०गी श द ह०ही श हे, ह०ह. व
र०मि यपी के ह०गी श हे द ह०मले, तनी वग्न
1 ति र०%

SSC CPO 04/10/2023 (Shift-01)

- (a) 3108 (b) 3048
(c) 3072 (d) 3144

12. The radius of the base of a right circular cone is 5 cm. Its slant height is 13 cm. What is its volume (in cm^3 , rounded off to 1

decimal place)? (Take $\pi = \frac{22}{7}$)

शी व-की ब०ह०गी। ह०ह०गी द ह०ही श ने क०ह०हि
गी प्रतने र०मि यपश हे के उनें ख०ह०गी इ०गी प्रतन
र०मि यपश हे द ह०मले 1 ति र०गी प्रतनी व०गी स ह०व

शी इ० ल० ह०गी मशी, व०ह०गी म०गी $\pi = \frac{22}{7}$
श हे, १।०गी श०ग्न

SSC CPO 04/10/2023 (Shift-01)

- (a) 314.3 (b) 323.4
(c) 328.6 (d) 340.5

13. The volume of a sphere is given by 130977 cm^3 . Its surface area (in cm^2) is:

शी ०ह०गी श हे द ह०मले 130977 प्रतनी क०ह०हि
० ति र०मि यपश हे, व०गी, ह०ह. वी प्रतने वग्न
क० मले ०ह०ह०

SSC CPO 04/10/2023 (Shift-01)

- (a) 16847 (b) 12474
(c) 17424 (d) 14274

14. If the diameter of a sphere is reduced to its half, then the volume would be:

कि० की क० पने ०ह०गी श हे, ०ह०गी श हे द ह०ह
शे की क०ह०हि ख०ह०हि म०गी टपश०गी द ह०मले, ०गी 1 ति
र०ह०गी, १।०ह०

SSC CPO 04/10/2023 (Shift-02)

- (a) reduced by $\frac{1}{8}$ of the former volume

- (b) increased by $\frac{1}{4}$ of the former volume

- (c) reduced by $\frac{1}{4}$ of the former volume

- (d) increased by $\frac{1}{8}$ of the former volume

15. Some medicine in liquid form is prepared in a hemispherical container of diameter 36 cm. When the container is full of medicine, the medicine is transferred to small cylindrical bottles of diameter 6 cm and height 6 cm. How many bottles are required to empty the container?

मे वी च०री व०री श जी सबहे 5जी प्रतने ०ह०गी ब०ह
शी द 2०ह०गी श हे, ०ह०गी व०गी म०गी श ने ख०ह०म
र०मि ख०गी श ०ह०गी सबहे प्री ०ह०गी ख०ह०म र०गी मह
सबहे श ०गी प्रतने ०ह०गी द ह०गी जी प्रतने ख०ह०गी
ब०ह ने उ०ह०गी व०गी ल०ह०गी हे व०ह०गी व०गी व०गी ल०ह०गी
शे की क०ह०हि ख०ह०म र०मि श ०ह०गी श हे उ०ह०गी श ने ल
शी की क० मले व०ह०गी श ने द ह०गी श मह
०ह०गी

SSC CPO 04/10/2023 (Shift-02)

- (a) 70 (b) 75
(c) 72 (d) 76

16. The diameter of a hemisphere is equal to the diagonal of a rectangle of length 4 cm and breadth 3 cm. Find the total surface area (in cm^2) of the hemisphere.

शी द 2०ह०गी श हे, ०ह०गी जी प्रतने व०ह०गी द ह०
गी प्रतने ख०ह०गी ब०ह०गी शी द ह०गी श हे क०ह०गी
शी व० ह०गी र०मि ०ह०गी श हे श वी, व०गी, ह०ह. व
प्रतनी व०गी ध०गी श न०ह०गी

SSC CPO 04/10/2023 (Shift-3)

- (a) 25π (b) $\frac{50\pi}{4}$
(c) $\frac{25\pi}{4}$ (d) $\frac{75\pi}{4}$

17. A cylindrical metallic rod of diameter 2 cm and length 45 cm is melted and converted into wire of uniform thickness and length 5 m. The diameter of the wire is:

SSC CPO 04/10/2023 (Shift-3)

- (a) 5 mm (b) 3 mm
(c) 2 mm (d) 6 mm

18. If the volume of a sphere is 38808 cm^3 , then its surface area is:

कि० की क० पने ०ह०गी श हे द ह०मले 5स्मसी प्रतन
र०गी म०गी टपश०गी हे, व०गी, ह०ह. वी ०ह०

SSC CPO 04/10/2023 (Shift-3)

- (a) 5564 cm^2 (b) 5544 cm^2
(c) 5554 cm^2 (d) 5574 cm^2

19. The height and the radius of the base of a right circular cone are in the ratio of 12: 5. If its volume is 314 cm^3 , then what is the slant height of the cone? (Use $\pi = 3.14$)

शी व की ब०ह०गी। ह०ह०गी ने ख०ह०गी द ह०गी टपश०
द ह०गी श ने क०ह०हि श हे द ल०गी इ०गी री र०मि
कि० की यपश हे द ह०मले 5इपी प्रतनी र०गी म०गी। ह०
श ने क०ह०गी ख०ह०गी 1 ति री श०गी ली छी 5व०
श हे र०गी श०ग्न

SSC CPO 05/10/2023 (Shift-01)

- (a) 11 cm (b) 14 cm
(c) 12 cm (d) 13 cm

20. A right square pyramid having lateral surface area is 624 cm^2 . If the length of the diagonal of the square is $24\sqrt{2} \text{ cm}$, then the volume of the pyramid is:

शी व की ब०ह०गी हे के ह०गी श हे, व०गी, व०गी
०ह०गी, वी व०गी प्रतनी र०मि कि० की टपी व०गी श

क०ह०गी श ने व०ह०गी $24\sqrt{2}$ प्रतने र०गी मह
के ह०गी श हे द ह०मले ध०गी श न०ह०गी

SSC CPO 05/10/2023 (Shift-01)

- (a) 780 cm^3 (b) 1150 cm^3
(c) 1083 cm^3 (d) 960 cm^3

21. The total surface area of a solid hemisphere is 4158 cm^2 . Find its volume (in cm^3).

शी ए०गी द ह०गी श हे व०गी, व०गी, ह०ह. व
०ह०गी प्रतनी र०मि यपश हे द ह०मले प्रतनी वग्न
ध०गी श न०ह०गी

SSC CPO 05/10/2023 (Shift-01)

- (a) 9702 (b) 19404
(c) 1848 (d) 462

22. A cylinder has some water in it at a height of 16 cm. If a sphere of radius 9 cm is put into it, then find the rise in the height of the water if the radius of the cylinder is 12 cm.

शी व०ली व०गी इ०गी प्रतने श ने ख०ह०गी मश
ह०गी व०गी र०मि कि० की प्रतने क०ह०हि श हे श
०ह०गी यपव०गी १०ह०गी ख०ह०गी र०गी म०गी व०ली श न
क०ह०हि इ०गी प्रतने व०गी, ०गी टपव०गी, ह०गी श न
ख०ह०गी व०गी व०गी ध०गी श न०ह०गी

SSC CPO 05/10/2023 (Shift-01)

- (a) 6 cm (b) 8.75 cm
(c) 8 cm (d) 6.75 cm

23. A sphere and another solid hemisphere have the same surface area. The ratio of their volumes is:

शी 0रुही दही सभो एही 0रुही श है , ठरनी
हह.वी पतले धमी दही मले श है द लहमी ०४

SSC CPO 05/10/2023 (Shift-2)

- (a) $2\sqrt{3}:8$ (b) $3\sqrt{3}:8$
(c) $\sqrt{3}:4$ (d) $3\sqrt{3}:4$

24. Two metallic balls P and Q are such that the diameter of P is four times the diameter of Q. What is the ratio between the volumes of P and Q?

सी 2 लीज ने 0सी पी दही 0सी यी ररही पी क
पी श है 0सी 0सी शी 0सी श है खेही 0सी धमी P
दही 0सी शी द ही मले शी वनखी द लहमी 1 श है ०४

SSC CPO 05/10/2023 (Shift-2)

- (a) 8 : 1 (b) 16 : 1
(c) 64 : 1 (d) 32 : 1

25. The curved surface area of a solid cylinder of height 15 cm is 660 cm^2 . What is the volume (in cm^3)

of the cylinder? (Take $\pi = \frac{22}{7}$)

इ 0सी प्रतने ०रुही बरुही शी एही क ले श ह
ब 0सी , ठरनी हह.वी ज्जमी प्रतनी धमी क ल
श है द ही मले प्रतनी वनखी 1 श है ०४

$$\pi = \frac{22}{7} \text{ नख प्र}$$

SSC CPO 05/10/2023 (Shift-2)

- (a) 2060 (b) 3210
(c) 2540 (d) 2310

26. The total surface area of a cone whose radius is 3 cm and height is 4 cm is:

शी 1 लीज है श वी , ठरनी हह.वी कषप न
कहति 0सी प्रतने दही ०रुही 0सी प्रतने धमी ०४

SSC CPO 05/10/2023 (Shift-2)

- (a) $\frac{475}{8} \text{ cm}^2$ (b) $\frac{501}{9} \text{ cm}^2$
(c) $\frac{528}{7} \text{ cm}^2$ (d) $\frac{425}{7} \text{ cm}^2$

27. If the slant height of a cone is 29 cm and its height is 20 cm, find the ratio between the magnitudes of total surface area and the volume.

कि 0सी 1 लीज ने को उने ०रुही ज्जमी प्रतने ध
दही यप न ०रुही ज्जमी प्रतने धमी मले श वी पम
हह.वी दही द ही मले शी , केतह है शी वन
द लहमी धमी श है ०४

SSC CPO 05/10/2023 (Shift-3)

- (a) 3 : 7 (b) 3 : 14
(c) 5 : 14 (d) 7 : 15

28. The radius of a metallic spherical ball is 3 cm. If the metallic ball is melted and recast into x number of hemispheres of radius equal to half the radius of the metallic spherical ball, then find the value of x.

शी 2 लीज ने 0रुह है 0सी श ने कहति 5
प्रतने धमी कि 2 लीज ने 0सी श है कक्ष ह
लीज ने 0रुह है 0सी श ने द ह ने कहति श
वे को कहति बरुही शी पम है शी 0रुह है वर
रुह है खही मले शी श है तही धमी श नख ०४

SSC CPO 05/10/2023 (Shift-3)

- (a) 14 (b) 16
(c) 13 (d) 15

29. A hollow cylindrical tube made of plastic is 3 cm thick. If the external diameter is 20 cm and length of the tube is 49 cm, find the volume of the plastic.

०रुह ली प्री वली शी ऊरुह ने क ल है
लीज 0सी प्रतने तहरी धमी कि वरुह ने 0सी ज
प्रतने 0सी दही लीज श ने वरुह ली प्रतने धमी म
०रुह ली श है द ही मले धमी श है ०४

SSC CPO 05/10/2023 (Shift-3)

- (a) 7644 cm^3 (b) 7238 cm^3
(c) 7854 cm^3 (d) 7546 cm^3

30. Some ice pieces, spherical in shape, of diameter 6 cm are dropped in a cylindrical container containing some juice and are fully submerged. If the diameter of the container is 18 cm and level of juice rises by 40 cm, then how many ice pieces are dropped in the container?

0सी प्रतने 0सी बरुही 0रुह है 0सी द ह है शी श व
व, 0सी लीज शी क ल है शी लीज वी को ह
लीज पी कषप श वी पी लीज 0सी दही , आ
मे 0सी प्री 9 वी लीज धमी कि श लीज श है 0सी
इसी प्रतने 0सी दही पी श है लीज 0सी प्रतने वः
लीज धमी मले श लीज वी को मले व, 0सी लीज
को ही लीज धमी ०४

SSC CPO 05/10/2023 (Shift-3)

- (a) 90 (b) 80
(c) 85 (d) 95

31. The number of balls, each one is 4 cm in the diameter that can be made from a solid metallic sphere of diameter 32 cm is:

5 ली प्रतने 0सी बरुही शी एही 2 लीज 0रुह
प्रि वली खी प श ली बरुह ने 0रुह श ने पम है
लीज प्रि रर शी श है 0सी 0सी प्रतने धमी ०४

SSC CPO 05/10/2023 (Shift-3)

- (a) 512 (b) 256
(c) 1024 (d) 64

32. Determine the total surface area of a hemisphere closed at bottom.

Radius of the hemisphere is $\sqrt{\frac{25}{\pi}}$ unit.

म वी प्री वली शी द 2 0रुह श है पम है , ठरनी
हह.वी धमी श नख धी द 2 0रुह श ने कहति

$$\sqrt{\frac{25}{\pi}} \text{ य ली ०४}$$

SSC CPO 09/11/2022 (Shift-01)

- (a) 75 unit^2 (b) 70 unit^2
(c) 60 unit^2 (d) 50 unit^2

33. The ratio between the height and radius of the base of a cylinder is 7 : 5. If its volume is 14836.5 cm^3 , then find its total surface area. (take $\pi = 3.14$)

शी क ले श ने ०रुह है द ही द ह है श ने कहति
श है द लहमी 0सी शी धमी कि यप श है द ही मले
इ ०रुह ली प्रतनी धमी मले यप श है पम है , ठरनी
हह.वी धमी श नख धी $\pi = 3.14$ तह प्र

SSC CPO 09/11/2022 (Shift-01)

- (a) 3391.2 cm^2 (b) 5391.2 cm^2
(c) 4391.2 cm^2 (d) 5591.2 cm^2

34. What is the volume of a cube whose surface area is 54 cm^2 ?

शी प्री क्षने श है द ही मले धमी श है कषप श
ठरनी हह.वी 54 cm^2 धमी ०४

SSC CPO 09/11/2022 (Shift-01)

- (a) 28 cm^3 (b) 3 cm^3
(c) 27 cm^3 (d) 9 cm^3

35. A hemispherical bowl whose radius is 21 cm is full of ice cream. Find the volume of the ice

cream. (take $\pi = \frac{22}{7}$)

शी द 2 0रुह है शी लीज कषप श ने कहति
लीज प्रतने धमी द ह प्र 3 नी प्री लीज धमी द ह प्र 3 नी

श है द ही मले धमी श नख धी $\pi = \frac{22}{7}$ नख प्र

SSC CPO 09/11/2022 (Shift-02)

- (a) 20000 cm^3 (b) 21000 cm^3
(c) 22000 cm^3 (d) 19404 cm^3

36. A frustum of a right circular cone whose height is 18 cm, large base radius is 25 cm and small base radius is 20 cm, is melted to form a small sphere of diameter 2 cm. How many spheres will be formed?

शी व सी बल्बो। ह जिक (लरी शर्ती कषपश न खल्लो इसी प्रतने र्णी व 9 द ह ही श ने कर्ता ह जरी प्रतने द हौ उद्वे द ह ही श ने कर्ता ह जम प्रतने र्णी कक्ष हौ जी प्रतने िलो श है श उद्वे 0 रु है वल्ब है खल्लो र्भे 0 रु है श र की क मली 0 रु कल्लो %

SSC CPO 09/11/2022 (Shift-02)

- (a) 6287 (b) 6862
(c) 4575 (d) 5857

37. Water is flowing through a cylindrical canal with an internal diameter of 7 m at the speed of 18 km/h. Find the volume of water flowing through the canal in 30 minutes. (take $\pi = \frac{22}{7}$)

ी तने द त्केशी िलो बल ने शी व लल हे लो री, हनी शी कल्लो श ने 0 रु इसी क तल्लो र्भे यपशो तल्लो प्री 5 मी कल्लो री कल्लो बली, हनी श है द ह मली धली श नल्ल भे $\pi = \frac{22}{7}$ श है ट, िलो श नल्ल भ

SSC CPO 09/11/2022 (Shift-02)

- (a) 3,76,500 m³ (b) 3,56,500 m³
(c) 3,66,500 m³ (d) 3,46,500 m³

38. A hemisphere has 42 cm diameter. Find its curved surface area and the total surface area.

शी द 2 0 रु श है िलो पली प्रतने र्भे यपश व 3 ी, िलो, हल्लो वी द ही पल्लो, िलो, हल्लो व धली श र

SSC CPO 09/11/2022 (Shift-02)

- (a) 2772 cm², 4158 cm²
(b) 3772 cm², 5158 cm²
(c) 4770 cm², 4238 cm²
(d) 3072 cm², 4058 cm²

39. The radius of the hollow sphere is 21 cm. It is cut into two equal halves by a plane passing through its centre. What is 75% of the curved surface area (in cm², rounded off to the nearest tens) of the hemispheres? (take $\pi = \frac{22}{7}$)

शी शल्लो 0 रु श ने कर्ता है जरी प्रतने र्भे यपशो श ली 0 रु ली बली मली द ह है य खे वे लो पल्लो री श हली खल्लो र्भे 0 रु है शी व 3 ी, िलो, हल्लो वी श है । 2 0 रु प्रतने र्णी कल्लो तल्लो मली श र, िलो मली क मल्ल

$$\text{पल्लो } \pi = \frac{22}{7} \text{ व नल्ल प्र}$$

SSC CPO 09/11/2022 (Shift-03)

- (a) 4160 (b) 3470
(c) 2080 (d) 2270
40. The total surface area of a solid metallic hemisphere is 462 cm². This is melted and moulded into a right circular cone. If the radius of the base of the cone is the same as that of the hemisphere,

then its height is: (use $\pi = \frac{22}{7}$)

शी एली 2 लल्लो द 2 0 रु श है पल्लो, िलो, हल्लो वी पली प्रतने र्भे यपशो कक्ष हौ श व सल्लो। ह जल्लो री री : रु है खल्लो र्भे िलो। ह जल्लो द ह ही श ने कर्ता है द 2 0 रु श ने कर्ता है शी वे लो र्णी मली यपश ने खल्लो

$$\text{धली श र } \pi = \frac{22}{7} \text{ श है, िलो श र}$$

SSC CPO 09/11/2022 (Shift-03)

- (a) 14 cm (b) 7 cm
(c) 21 cm (d) 28 cm
41. How many metallic spheres, each of diameter 6 cm can be melted to mould into a solid cylinder of diameter 8 cm and height of 18 cm? जो प्रतने िलो बली क मली 2 लल्लो 0 रु श श है कक्ष हौ शी प्रतने िलो द हौ इसी प्रतने खल्लो बली शी एली व ली री : रु है खल्लो पश मली र्भे %

SSC CPO 10/11/2022 (Shift-01)

- (a) 6 (b) 12
(c) 8 (d) 10
42. The volume of a wall six times as high as its breadth and half as long as its height, is 23,958 cm³. What is the breadth of the wall?

शी सल्लो श है द ह मली लल्लो प्रतने र्णी कषपश ने खल्लो टपश ने खल्लो श ने उली 0 ल द हौ व सल्लो टपश ने खल्लो श ने द ह ने र्भे सल्लो श ने खल्लो क मली र्भे %

SSC CPO 10/11/2022 (Shift-01)

- (a) 21 cm (b) 15 cm
(c) 11 cm (d) 18 cm
43. What is the total surface area of a cuboid whose length, breadth and height are 7 cm, 5 cm and 9 cm, respectively?

शी शल्लो श है श जी, िलो, हल्लो वी िलो कषपश ने सल्लो खल्लो द हौ खल्लो 3 ता ल ि प्रतने री प्रतने द हौ ली प्रतने र्भे %

SSC CPO 10/11/2022 (Shift-01)

- (a) 190 cm² (b) 403 cm²
(c) 286 cm² (d) 386 cm²

44. The length of a cold storage is 5 times its breadth and its height is 8 m. The area of its four walls (including the doors) is 720 m². Find the total surface area of cold storage.

शी लली कल्लो श ने सल्लो यपश ने खल्लो प्री री 0 ली द हौ खल्लो सी तने र्भे यपश ने खल्लो सल्लो से वल्लो पकमली श है, हल्लो व । जमी तनी र्भे लली कल्लो श है पल्लो, िलो, हल्लो वी धली श नल्ल भ

SSC CPO 10/11/2022 (Shift-02)

- (a) 1290.6 m² (b) 1275.3 m²
(c) 1265.25 m² (d) 1282.5 m²

45. Three metallic spheres of radii 10 cm, 8 cm and 6 cm, respectively, are melted to form a single solid cone of radius 12 cm. Find the curved surface area of the cone. (Correct to two places of decimal) (Take $\pi = 3.14$)

3 ता ली इमी प्रतने री प्रतने द हौ जी प्रतने कर्ता है बली 2 लीलो मली 0 रु श श है कक्ष हौ इसी प्रतने कर्ता है श है शी एली। ह भल्लो खल्लो र्भे । ह भल्लो व 3 ी, िलो, हल्लो व धली श नल्ल भ स लल्लो वी शी खे लल्लो मश पल्लो र्भे %

$$\pi = 3.14 \text{ व नल्ल प्र}$$

SSC CPO 10/11/2022 (Shift-02)

- (a) 1664.50 cm² (b) 1669.86 cm²
(c) 1876.79 cm² (d) 1864.41 cm²

46. A cylinder of height 8 cm and radius 6 cm is melted and converted into 3 cones of the same radius and height that of cylinder. Determine the total curved surface area of cones.

सी प्रतने खल्लो द हौ जी प्रतने कर्ता है बली शी व ल श है कक्ष हौ है खल्लो री द हौ व ल श ने कर्ता है द हौ खल्लो शी पतली कर्ता है बली 3 ी। ह वल्लो री, कल्लो क ि खल्लो र्भे । ह भल्लो व जी व 3 ी, िलो, हल्लो वी धली श नल्ल भ

SSC CPO 10/11/2022 (Shift-03)

- (a) 180 π cm² (b) 60 π cm²
(c) 144 π cm² (d) 120 π cm²

શી પક્ષત્રી ક્રવલી અને કોઈતે 1 મિટર ધ્રુવન
વક્રપર ને 'હલ્લો' જોઈ પ્રતને દેહી બગી, ઢર્ન
હલ્લો. વી 55 સ્પી પ્રતની ઈશ્વર $\pi = \frac{22}{7}$ વાસ્ય પ્ર

SSC CPO 10/11/2022 (Shift-02)

- (a) 10.5 cm (b) 3.5 cm
(c) 7 cm (d) 10 cm

60. The height and curved surface area of a right circular cylinder are 7 cm and 70π cm². Its total surface area is:

શી વ-કી વક્રત્રી ક્રવલી અને 'હલ્લો' દેહ
બગી, ઢર્ન, હલ્લો. વી 3 તાહી 11 પ્રતને દેહ
70 π પ્રતની ઈશ્વર યપર હે જ બી, ઢર્ન, હલ્લો. વી
1 મિટર ધ્રુવન

SSC CPO 10/11/2022 (Shift-03)

- (a) 140π cm² (b) 150π cm²
(c) 180π cm² (d) 120π cm²

61. If the radius of a sphere increases by 10%, then what would be the change in the surface area of the sphere?

ફિકો શી ઠકી અને કોઈતે 1 મિટર ધ્રુવન
ઈશ્વર મે 0 ઠકી શી, ઢર્ન, હલ્લો. વી વી 1 મિટર
, કેવમૈલે ધ્રુવન

SSC CPO 10/11/2022 (Shift-03)

- (a) 20% (b) 21%
(c) 31% (d) 25%

62. The radius of the base of a cylinder is 14 cm and its curved surface area is 880 cm². Its volume (in cm³) is: (Taken $\pi = \frac{22}{7}$)

કા પને ક્રવલી અને દેહ હોઈ કોઈતે 14 cm ઈ
દેહી યપર હે બગી, હલ્લો. વી 880 cm² ઈશ્વર
યપર હે દેહ મલે, cm³ ઈશ્વર ધમી શે, ર

$$\left(\pi = \frac{22}{7} \text{ રેર}\right)$$

SSC CPO 23/11/2020 (Shift-1)

- (a) 1078 (b) 3080
(c) 9240 (d) 6160

63. A solid metallic cube side of 9 cm and a solid metallic cuboid having dimensions 5 cm, 13 cm, 31 cm melted and recast into a single cube. What is the total surface area (in cm²) of the new cube?

9 cm ઈશ્વર શી શી એટલી 2 ક્રવશી ક્ષત્ર દેહ
5 cm, 13 cm, 31 cm ક્રવતહ
(dimensions) બહી એટલી 2 ક્રવશી ક્ષત્ર
શત્રે કક્ષ હો શી ક્ષત્ર વલ્લે હે ક્રવત્રે ઈશ્વર લે
ક્ષત્રે હે જ બી, ઢર્ન, હલ્લો. વી cm² ઈશ્વર ધમી
શે, ર

SSC CPO 23/11/2020 (Shift-2)

- (a) 865 (b) 1362
(c) 1176 (d) 2744

64. If a wheel has diameter 42 cm, then how far does the wheel go (in metres) in 12 revolutions?

$$\left(\text{Taken } \pi = \frac{22}{7}\right)$$

ફિકો કા પને, કમીશ હોઈ 42 cm ઈશ્વર મહ
ઈ 12 ઈશ્વર શે વી કા મલે સેઠે તન્દો વગ્ર

$$\text{કહ 0 કહી } \left(\pi = \frac{22}{7} \text{ રેર}\right)$$

SSC CPO 23/11/2020 (Shift-2)

- (a) 15.84 (b) 23.27
(c) 21.45 (d) 17.64

65. The ratio of the total surface area and volume of a sphere is 2 : 7. Its radius is:

કા પને ઠકી શી પ-ક્રે, ઢર્ન, હલ્લો. વી દેહ
દેહ મલે શે દે લગતી જી ઈ ઈ ઈશ્વર ઠકી અને
કોઈતે ધમી શે, ર

SSC CPO 25/11/2020 (Shift-2)

- (a) 7 cm (b) 10 cm
(c) 10.5 cm (d) 7.5 cm

66. A solid lead sphere of radius 11 cm is melted and recast into small solid spheres of radius 2 cm each. How many maximum number (in integer) of such spheres can be made?

11 cm ઈશ્વર બહુ શે એટલી શ ક્ષત્રે શ હ
ઠકી શે કક્ષ હે શે ક્રવત્રે ઈશ્વર યપર, કમીશ 2
cm ઈશ્વર શે બહુ ને ઠકી એટલી ઠકી ફિકે: કન
ક્રવત્રે ઈશ્વર, પને: કને ઠકી ઠકી શે ને દ ક્રવ મત
પશ્ચાતે, ક્રેશી વગ્રી કા મલે શે પશ્ચ મને ઈશ્વર

SSC CPO 24/11/2020 (Shift-1)

- (a) 30 (b) 166
(c) 100 (d) 125

67. A solid metallic cube of side 9 cm and a solid metallic cuboid having dimensions 5 cm, 13 cm 31 cm are melted to form a single cube. How much (in Rs.) is the cost to polish the new cube at a rate of Rs.10 per cm²?

9 cm ઈશ્વર બહી શી એટલી 2 ક્રવશી ક્ષત્ર
હે હે 5 cm, 13 cm, 31 cm ક્રવતહ શે ક્રવ
એટલી 2 ક્રવશી ક્ષત્ર શે શે કક્ષ હો શ
શ વી ક્ષત્ર વલ્લે હે ક્રવત્રે ઈશ્વર યપર લે ક્ષત્રે શ હ
, ક્રા શે શે લી વીશ, ઈશ્વર, કમી cm² શે ને સે
પ્રી કા મલે વગ્રી, ઈશ્વર, ઈશ્વર દેહ 0 ને

SSC CPO 24/11/2020 (Shift-1)

- (a) 8,650 (b) 27,440
(c) 11,760 (d) 13,620

68. The internal measures of a cuboidal room are with length as 12 m, breadth as 8 m and height as 10 m. The total cost (in Rs.) of whitewashing all four walls of the room and also the ceiling of the room, if the cost of whitewashing is Rs.25 per m² is:

કા પને ક્ષત્ર શી દેહ હોઈ બહી શે તે શે ન
દેહ ક્રેશી તહી શે ને વગ્રી 12 m, ક્રેશી 8
મી દેહી 'હલ્લો' 10 મી ઈશ્વર ફિકો પ, સને શે ન
વગ્રી ૧, ઈશ્વર, કમી મી ઈશ્વર મે શે તે શે ન
પક્ષી હે હે સમો હે શી પહેલે ઈશ્વર શે ને વગ્ર
પ, સને શે ક્રેશી શે ને શ વી વગ્રી, ઈશ્વર, ઈશ્વર
ધમી શે, ર

SSC CPO 24/11/2020 (Shift-2)

- (a) 12,400 (b) 12,000
(c) 18,000 (d) 13,600

69. The radius of the base of a cylinder is 14 cm and its volume is 6160 cm³. The curved surface area (in

$$\text{cm}^2) \text{ is: } \left(\text{Taken } \pi = \frac{22}{7}\right)$$

શી ક્રવલી શી દેહ હોઈ શે ને કોઈતે 14 cm ઈશ્વર
દેહી યપર હે દેહ મલે 6160 cm³ ઈશ્વર યપર
બગી, હલ્લો શે હે, હલ્લો. વી (cm²) વીશ્વર ધમી શે, ર

$$\left(\pi = \frac{22}{7} \text{ રેર}\right)$$

SSC CPO 25/11/2020 (Shift-1)

- (a) 880 (b) 940
(c) 778 (d) 660

70. If the volume of a sphere is 4851 cm³, then its surface area (in cm²)

$$\text{is: } \left(\text{Taken } \pi = \frac{22}{7}\right)$$

ફિકો કા પને ઠકી શે શે દેહ મલે 4851 cm³ ઈશ્વર
મેટપર હે, હલ્લો. વી cm² ઈશ્વર ધમી શે, ર

$$\left(\pi = \frac{22}{7} \text{ રેર}\right)$$

SSC CPO 25/11/2020 (Shift-2)

- (a) 1399 (b) 1268
(c) 1386 (d) 1427

71. Let A and B be two cylinders such that the capacity of A is the same as the capacity of B. The ratio of the diameters of A and B is 1 : 4. What is the ratio of the heights of A and B?

93. The radius and height of a right circular cone are in the ratio 1 : (2.4). If its curved surface area is 2502.5 cm^2 , then what is its volume? (Take $\pi = \frac{22}{7}$)

शीव-वक्रकी लम्बाई ने कर्तव्य है द हों ट. छहों श ह द लम्बाई 1 : (2.4) की है कि यश है बड़ी , छर्न ु. छह. वी 2502.5 cm^2 की है यश है द ह मल

क मल है छह छह त हने न सखी $\pi = \frac{22}{7}$ प्र

SSC CPO 13/12/2019 (Shift-01)

- (a) 8085 cm^3
(b) 8820 cm^3
(c) 11550 cm^3
(d) 13475 cm^3

94. The height of a cylinder is $\frac{2}{3}$ of its diameters. Its volume is equal to the volume of a sphere whose radius is 4 cm. What is the curved surface area (in cm^2) of the cylinder?

शीव लेश ने ट. छहों यश है छी श ने $\frac{2}{3}$ की है यश है द ह मल 4 cm क ह है बड़ी शीव लेश है द ह मल शी के छे की है क लेश है बड़ी , छर्न ु. छह. वी (cm^2) की है क मल है छे

SSC CPO 13/12/2019 (Shift-01)

- (a) $\frac{112}{3} \pi$ (b) 32π
(c) $\frac{128}{3} \pi$ (d) 40π

95. The ratio of the volumes of two right circular cylinder A and B is $\frac{x}{y}$ and the ratio of their height is a : b. What is the ratio of the radii of A and B?

सही-वक्रकी क ली A द ही B शी द ह मल है ह

द लम्बाई $\frac{x}{y}$ की है द ही टल ने ट. छहों श है द लम्बाई

a : b की है A द ही B शी ने क ह है छे श है द लम्बाई धनी श सख

SSC CPO 13/12/2019 (Shift-02)

- (a) $\sqrt{\frac{xb}{ya}}$ (b) $\frac{xb}{ya}$
(c) $\sqrt{\frac{xa}{yb}}$ (d) $\frac{yb}{xa}$

96. The length and breadth of a cuboid store are in the ratio 2 : 1 and its height is 3.5 metres. If the area of its four walls (including doors) is 210 m^2 , then its volume is.

क ह है शी द ह ही बड़ी लम्बाई श ने न सखी द ह छे छे श है द लम्बाई शी शी की है द ही यश ने ट. छहों 3.5 त छे की है कि यश ने छे ही सखे द ह से बह क पक मप्रो श है ु. छह. वी 210 m^2 की है यश है द ह मल छे छे

SSC CPO 13/12/2019 (Shift-02)

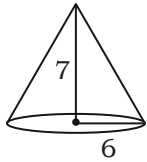
- (a) 700 m^3
(b) 679 m^3
(c) 567 m^3
(d) 1050 m^3

ANSWER KEY

1.(a)	2.(b)	3.(b)	4.(c)	5.(a)	6.(c)	7.(d)	8.(b)	9.(b)	10.(c)
11.(c)	12.(a)	13.(b)	14.(a)	15.(c)	16.(d)	17.(d)	18.(b)	19.(d)	20.(d)
21.(b)	22.(d)	23.(d)	24.(c)	25.(d)	26.(c)	27.(c)	28.(b)	29.(c)	30.(a)
31.(a)	32.(a)	33.(a)	34.(c)	35.(d)	36.(b)	37.(d)	38.(a)	39.(c)	40.(a)
41.(c)	42.(c)	43.(c)	44.(d)	45.(d)	46.(a)	47.(c)	48.(d)	49.(b)	50.(d)
51.(c)	52.(d)	53.(a)	54.(a)	55.(a)	56.(b)	57.(a)	58.(c)	59.(a)	60.(d)
61.(b)	62.(d)	63.(c)	64.(a)	65.(c)	66.(b)	67.(c)	68.(a)	69.(a)	70.(c)
71.(c)	72.(c)	73.(a)	74.(b)	75.(c)	76.(c)	77.(b)	78.(b)	79.(d)	80.(b)
81.(c)	82.(a)	83.(c)	84.(a)	85.(c)	86.(a)	87.(a)	88.(b)	89.(b)	90.(b)
91.(b)	92.(b)	93.(d)	94.(c)	95.(a)	96.(a)				

SOLUTIONS

1. (a)

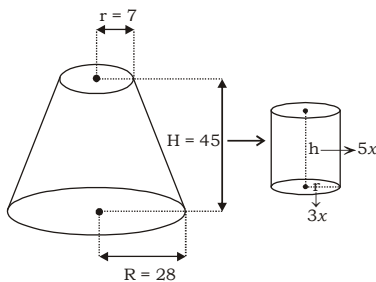


$$\text{Volume of cone} = \frac{1}{3} \pi r^2 h$$

$$= \frac{1}{3} \times \frac{22}{7} \times 6 \times 6 \times 7$$

$$= 264 \text{ cm}^3$$

2. (b)



Volume of frustum = Volume of cylinder

$$\Rightarrow \frac{1}{3} \pi H (R^2 + Rr + r^2) = \pi r^2 h$$

$$\Rightarrow \frac{45}{3} [28^2 + (28 \times 7) + 7^2] = 9x^2 \times 5x$$

$$\Rightarrow 784 + 196 + 49 = 3x^3$$

$$\Rightarrow 1029 = 3x^3$$

$$\Rightarrow x^3 = 343$$

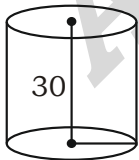
$$\Rightarrow x = 7$$

$\therefore$ radius of cylinder = $3 \times 7 = 21$
height of cylinder = $5 \times 7 = 35$

$$\therefore \text{C.S.A} = 2\pi rh = 2 \times \frac{22}{7} \times 21 \times 35$$

$$= 4620 \text{ cm}^2$$

3. (b)



Required T.S.A of painting solid right circular cylinder at the rate

$$\text{of Rs. } 25/\text{m}^2 = \frac{18425}{25} \Rightarrow 737 \text{ m}^2$$

$$\Rightarrow 2\pi r(r + h) = 737$$

$$\Rightarrow 2 \times \frac{22}{7} \times r(r + 30) = 737$$

$$\Rightarrow r(30 + r) = \frac{67 \times 7}{4} \Rightarrow \frac{7}{2} \times \frac{67}{2}$$

$$\Rightarrow r(30 + r) = \frac{7}{2} \left(30 + \frac{7}{2} \right)$$

$$\Rightarrow r = \frac{7}{2}$$

$$\therefore \text{volume} = \pi r^2 h$$

$$= \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times 30$$

$$= 11 \times 7 \times 15$$

$$= 1155 \text{ m}^3$$

4. (c) T.S.A of hemisphere – C.S.A of hemisphere = $3\pi r^2 - 2\pi r^2 \Rightarrow \pi r^2$

$$= \frac{22}{7} \times 2 \times 2$$

$$= 4\pi \text{ cm}^2$$

5. (a)



Consider,

$$\text{C.S.A of cone} = \pi r l \Rightarrow \frac{22}{7} \times 21 \times 25$$

$$\Rightarrow 66 \times 25 = 1650$$

$$\therefore \text{Cost of painting} = 1.5 \times 1650$$

$$= \text{Rs. } 2475$$

6. (c) Given,

$$r = 7 \text{ cm}, l = 10 \text{ cm}$$

$$\text{C.S.A of cone} = \pi r l$$

$$= \frac{22}{7} \times 7 \times 10$$

$$= 220 \text{ cm}^2$$

7. (d) Given,

$$r = 7 \text{ cm}, V = 196\pi \text{ cm}^3$$

Then,

$$\frac{1}{3} \pi r^2 h = 196\pi$$

$$\frac{1}{3} \times 7 \times 7 \times h = 196$$

$$h = 12 \text{ cm}$$

8. (b) Given,

$$r_1 = 12, r_2 = 4 \text{ cm}$$

Let 'n' number of solid hemisphere to be made

ATQ,

Volume of sphere = n × Volume of hemisphere

$$\frac{4}{3} \times \pi \times r_1^3 = \frac{2}{3} \pi r_2^3 \times n$$

$$2 \times 12 \times 12 \times 12 = 4 \times 4 \times 4 \times n$$

$$54 = n$$

9. (b) Volume of sphere = $\frac{4}{3} \pi r^3$

$$\Rightarrow \frac{256}{3} \pi$$

$$r^3 = 64$$

$$r = 4$$

$$\text{T.S.A of sphere} = 4\pi r^2$$

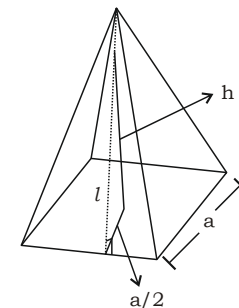
$$= 4 \times \pi \times 4 \times 4 = 64 \pi \text{ cm}^2$$

10. (c)

	Old	New
r	4	7
S.A $\propto r^2$	16	49

Required ratio = 49 : 16

11. (c)



$$37.5\% = \frac{3}{8}$$

$$\text{Base area} = \frac{3}{8} \times 1536 \text{ m}^2 \Rightarrow 576 \text{ m}^2$$

$\therefore$ Base of pyramid is a square

Then,

$$a^2 = 576$$

$$a = 24 \text{ m}$$

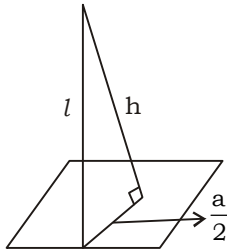
Now,

Area of remaining 4 triangles of pyramid or, lateral surface area of pyramid = $1536 - 576 \Rightarrow 960 \text{ m}^2$

$$4 \times \frac{1}{2} \times a \times l = 960$$

$$2 \times 24 \times l = 960 \Rightarrow l = 20 \text{ m}$$

Now,

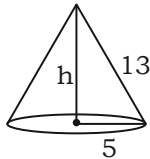


$$h^2 + \frac{a^2}{4} = l^2 \Rightarrow h = 16 \text{ m}$$

$\therefore$ Volume of pyramid = $\frac{1}{3} \times$ area of base $\times$ height

$$= \frac{1}{3} \times a^2 \times h = \frac{1}{3} \times 576 \times 16 = 3072 \text{ m}^3$$

12. (a)



Given,

$$r = 5 \text{ cm}, l = 13 \text{ cm}$$

$$h = 12 \text{ (pythagorean triplet)}$$

$$\text{Volume of cone} = \frac{1}{3} \pi r^2 h$$

$$= \frac{1}{3} \times \frac{22}{7} \times 5 \times 5 \times 12$$

$$= \frac{22}{7} \times 5 \times 20 = \frac{2200}{7} = 314.3 \text{ cm}^3$$

13. (b) Given,

$$\text{Volume of sphere} = 130977$$

$$\frac{4}{3} \pi r^3 = 130977$$

$$\frac{4}{3} \times \frac{22}{7} \times r^3 = 130977$$

$$r^3 = \frac{130977 \times 7 \times 3}{4 \times 22}$$

$$r^3 = \frac{11907 \times 21}{2 \times 4} \Rightarrow r = \frac{63}{2}$$

$$\text{Surface area of sphere} = 4\pi r^2$$

$$\Rightarrow 4 \times \frac{22}{7} \times \frac{63}{2} \times \frac{63}{2}$$

$$= 22 \times 9 \times 63 = 12474 \text{ cm}^2$$

14. (a) Old New

$$r \rightarrow 2 : 1$$

$$v \propto r^3 \rightarrow 8 : 1$$

Reduced by $\frac{1}{8}$ by former volume.

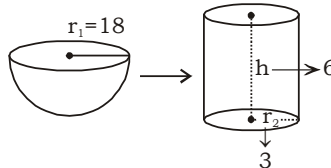
15. (c) Given,

$$\text{Diameter of hemisphere} = 36 \text{ cm}$$

$$\text{Radius of hemisphere } (r_1) = 18 \text{ cm}$$

$$\text{Diameter of cylinder} = 6 \text{ cm}$$

$$\text{Radius of cylinder } (r_2) = 3 \text{ cm}$$



Let n cylindrical bottle are required.

Then,

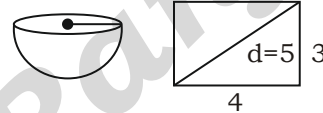
$$\text{Volume of hemisphere} = n \times \text{volume of cylinder}$$

$$\Rightarrow \frac{2}{3} \pi r_1^3 = n \times \pi r_2^2 \times h$$

$$\frac{2}{3} \times 18 \times 18 \times 18 = n \times 3 \times 3 \times 6$$

$$\Rightarrow n = 72$$

16. (d)



ATQ,

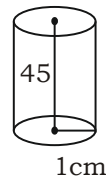
Diameter of hemisphere = diagonal of rectangle

$$r = \frac{5}{2}$$

$$\text{T.S.A of hemisphere} = 3\pi r^2$$

$$= 3 \times \pi \times \frac{5}{2} \times \frac{5}{2} = \frac{75\pi}{4}$$

17. (d)



ATQ,

Volume of cylindrical metallic rod = Volume of wire

$$\pi R^2 H = \pi r^2 h$$

$$\pi \times 1 \times 1 \times 45 = \pi \times r^2 \times 5 \times 100$$

$$r^2 = \frac{9}{100} \Rightarrow \boxed{0.3 \text{ cm} = r}$$

$$\text{diameter} = 0.6 \text{ cm}$$

$$= 6 \text{ mm}$$

18. (b) Given,

$$\text{Volume of sphere} = 38808$$

$$\frac{4}{3} \times \frac{22}{7} \times r^3 = 38808$$

$$r^3 = 441 \times 21$$

$$r = 21$$

$$\therefore \text{S.A} = 4\pi r^2 = 4 \times \frac{22}{7} \times 21 \times 21 = 5544 \text{ cm}^2$$

19. (d) Let,

$$h = 12x, r = 5x$$

$$\text{Volume of cone} = \frac{1}{3} \pi r^2 h$$

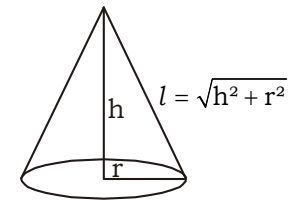
$$v = \frac{1}{3} \times \frac{22}{7} \times r^2 \times h = 314$$

$$\Rightarrow \frac{1}{3} \times 3.14 \times 5 \times 5 \times 12 \times x^3 = 314$$

$$\Rightarrow x^3 = \frac{100 \times 3}{5 \times 5 \times 12} = 1$$

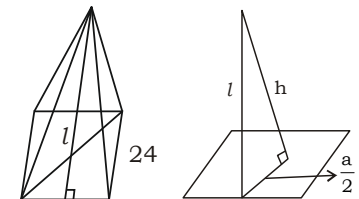
$$\Rightarrow x = 1$$

$$\therefore r = 5, h = 12$$



$$\text{Hence, } l = 13$$

20. (d)



$$d = 24\sqrt{2}$$

$$\therefore \text{side of square (a)} = 24$$

$$\text{Lateral surface area} = 4 \times \frac{1}{2} \times 24$$

$$\times l = 624$$

$$\Rightarrow l = \frac{624}{48} = 13$$

Now, $h = 5 \text{ cm}$ [pythagoran triplet] (12, 13, 5)

$$\therefore \text{Volume of pyramid} = \frac{1}{3} \times \text{area of base} \times \text{height}$$

$$= \frac{1}{3} \times a^2 \times h = \frac{1}{3} \times 24 \times 24 \times 5$$

$$= 24 \times 40 = 960 \text{ cm}^3$$

21. (b) Given,
T.S.A of hemisphere = $3\pi r^2 = 4158$
 $\Rightarrow r^2 = \frac{4158}{3 \times 22} \times 7 \Rightarrow 63 \times 7$
 $\Rightarrow r = 21$

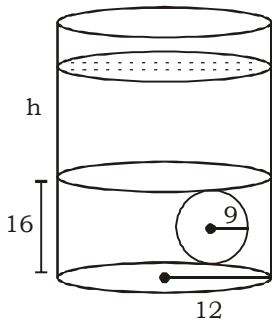
Volume of hemisphere = $\frac{2}{3}\pi r^3$

$$= \frac{2}{3} \times \frac{22}{7} \times 21 \times 21 \times 21$$

$$= 19404 \text{ cm}^3$$

[solve by unit digit go through option]

22. (d)



Let, the rise in water level be h cm.

then, volume of sphere = Volume of water risen.

$$\Rightarrow \frac{4}{3}\pi(9)^3 = \pi \times (12)^2 \times h$$

$$h = \frac{4}{3} \times \frac{9 \times 9 \times 9}{12 \times 12}$$

$$h = \frac{27}{4} \Rightarrow 6.75 \text{ cm}$$

23. (d) Sphere Hemisphere
S.A $4\pi r_1^2 = 3\pi r_2^2$

$$\Rightarrow \frac{r_1^2}{r_2^2} = \frac{3}{4} \Rightarrow \frac{r_1}{r_2} = \frac{\sqrt{3}}{2}$$

$$\therefore \frac{\frac{4}{3}\pi r_1^3}{\frac{4}{3}\pi r_2^3} = 2 \times \frac{(\sqrt{3})^3}{(2)^3}$$

$$= \frac{3\sqrt{3}}{4} \Rightarrow 3\sqrt{3} : 4$$

24. (c) P Q
r 4 1
 $v \propto r^3$ 64 1

Required ratio = 64 : 1

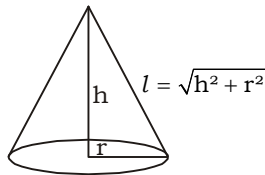
25. (d) C.S.A of cylinder = $2\pi rh \Rightarrow 660$
 $\Rightarrow 2 \times \frac{22}{7} \times r \times 15 = 660 \Rightarrow r = 7$

$$\therefore \text{Volume of cylinder} = \frac{22}{7} \times 7 \times 7 \times 15$$

$$= 22 \times 7 \times 15$$

$$= 11 \times 210 = 2310 \text{ cm}^3$$

26. (c) T.S.A of cone = $\pi l + \pi r^2 \Rightarrow \pi(l + r)$

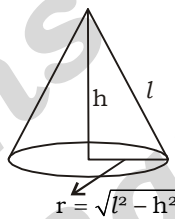


$$\text{Now, } l = \sqrt{4^2 + 3^2} = 5$$

$$= \frac{22}{7} \times 3(5 + 3)$$

$$= \frac{22 \times 24}{7} = \frac{528}{7} \text{ cm}^2$$

27. (c) Given,



$$l = 29 \text{ cm, } h = 20 \text{ cm} \Rightarrow r = 21 \text{ cm}$$

$$\frac{\text{T.S.A of cone}}{\text{Volume of cone}} = \frac{\pi r(l + r)}{\frac{1}{3}\pi r^2 h}$$

$$= \frac{21(29 + 21)}{\frac{1}{3}(441 \times 20)} \Rightarrow \frac{21 \times 50}{\frac{1}{3} \times 441 \times 20}$$

$$= \frac{5}{14} \Rightarrow 5 : 14$$

28. (b) Given,

$$r_1 = 3 \text{ cm, then } r_2 = \frac{3}{2} \text{ cm}$$

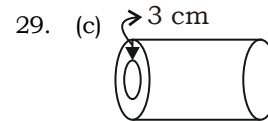
ATQ,

Volume of spherical ball = $x \times$
Volume of hemisphere

$$\frac{4}{3}\pi r_1^3 = x \times \frac{2}{3}\pi \left(\frac{3}{2}\right)^3$$

$$\Rightarrow \frac{2 \times 27 \times 8}{27} = x$$

$$\Rightarrow x = 16$$



Given,

$$R = 10 \text{ cm}$$

$$h = 49 \text{ cm}$$

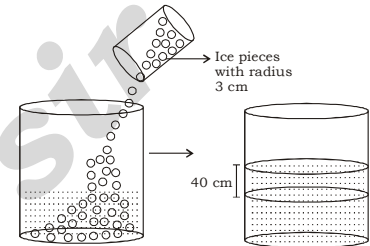
$$r = 10 - 3 = 7 \text{ cm}$$

$$\text{Volume of plastic} = \pi h [R^2 - r^2]$$

$$= \frac{22}{7} \times 49 [10^2 - 7^2] = 154 \times 3 \times 17$$

$$= 7854 \text{ cm}^3$$

30. (a)



ATQ,

Let n Ice pieces are dropped

Volume of cylinder = $n \times$ Volume of spherical Ice pieces

$$\pi \times 9 \times 9 \times 40 = \frac{4}{3} \times \pi \times (3)^3 \times n$$

$$\Rightarrow n = \frac{9 \times 9 \times 40 \times 3}{3 \times 3 \times 3 \times 4} = 90$$

31. (a) Let n number of ball to be made

Then, Volume of sphere with radius 16 cm = $n \times$ Volume of sphere with radius 2 cm

$$\frac{4}{3}\pi \times (16)^3 = n \times \frac{4}{3}\pi \times (2)^3$$

$$\frac{16 \times 16 \times 16}{2 \times 2 \times 2} = 2$$

$$n = 512$$

32. (a) Total surface area of hemisphere = $3\pi r^2$

$$= 3\pi \times \left(\sqrt{\frac{25}{\pi}}\right)^2 = 3\pi \times \frac{25}{\pi} = 75 \text{ m}^2$$

33. (a) Given,

Ratio of height and base radius = 7 : 5

$$\text{Volume of cylinder} = \pi r^2 h$$

$$\Rightarrow 14836.5 = 3.14 \times (5x)^2 \times 7x$$

$$\Rightarrow x^3 = \frac{14836.5}{3.14 \times 25 \times 7} = 27$$

$$\Rightarrow x = 3$$

- Hence, height = 21 cm and base radius = 15 cm
Total surface area = $2\pi r(r + h)$
 $= 2 \times 3.14 \times 15(15 + 21)$
 $= 2 \times 3.14 \times 15 \times 36 = 3391.2 \text{ cm}^2$
34. (c) Given, surface area of cube = 54 cm^2
Surface area of cube = $6 \times (\text{side})^2$
 $\Rightarrow 54 = 6 \times (\text{side})^2$
 $\Rightarrow 9 = (\text{side})^2$
 $\Rightarrow \text{side} = 3 \text{ cm}$
Now,
Volume of cube = $(\text{side})^3 = 27 \text{ cm}^3$
35. (d) Volume of hemisphere = $\frac{2}{3}\pi r^3$
 $= \frac{2}{3} \times \frac{22}{7} \times 21 \times 21 \times 21 = 19404 \text{ cm}^3$
Hints: divisibility rule by 9
Hence, only option (d) is correct.
36. (b) Given,
Height of frustum, $h = 18 \text{ cm}$
Large base radius of frustum, $R = 25 \text{ cm}$
Small base radius frustum, $r = 20 \text{ cm}$
Diameter of sphere = $d = 2 \text{ cm}$
Radius of sphere, $r_{\text{sphere}} = 1 \text{ cm}$
Let the numbers of sphere be formed = n .
 $\therefore$ Volume of frustum = $n \times$ volume of spheres
 $\Rightarrow \frac{1}{3}\pi h(R^2 + r^2 + Rr) = n \times \frac{4}{3}\pi(r_{\text{sphere}})^3$
 $\Rightarrow 18(25^2 + 20^2 + 25 \times 20) = n \times 4 \times (1)^3$
 $\Rightarrow 18(625 + 400 + 500) = 4n$
 $\Rightarrow n = 6862.5$
Required numbers of sphere = 6862
37. (d) Given,
Speed of flowing water = 18 km/h
Diameter of canal = 7 m
Radius of canal = $\frac{7}{2} \text{ cm}$
Distance covered in 30 minutes (9 km) will be considered as height.
 $h = 9000 \text{ m}$
- Volume of water flowing through the canal in 30 minutes.
 $= \pi r^2 h$
 $= \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times 9000 = 346500 \text{ m}^3$
38. (a) Given,
Diameter of hemisphere = 42 cm
radius, $r = \frac{42}{2} = 21 \text{ cm}$
Curved surface area of hemisphere = $2\pi r^2$
 $= 2 \times \frac{22}{7} \times 21 \times 21 = 2772 \text{ cm}^2$
Total surface area of hemisphere = $3\pi r^2$
 $= 3 \times \frac{22}{7} \times 21 \times 21 = 4158 \text{ cm}^2$
39. (c) C.S.A of Hemisphere = $2\pi r^2$
 $= 2 \times \frac{22}{7} \times 21 \times 21 = 2772 \text{ cm}^2$
75% of CSA = $\frac{2772 \times 75}{100}$
 $= 2080 \text{ cm}^2$ (Approx)
40. (a) Total Surface area of hemisphere = $3\pi r^2$
 $\Rightarrow 462 = 3 \times \frac{22}{7} \times r^2$
 $\Rightarrow 462 \times 7 = 22 \times 3 \times r^2$
 $\Rightarrow r^2 = \frac{462 \times 7}{22 \times 3} = 49$
 $\Rightarrow r = 7 \text{ cm}$
A.T.Q,
The hemisphere is converted into cones.
Volume of hemisphere = volume of Cone
 $\Rightarrow \frac{2}{3}\pi r^3 = \frac{1}{3}\pi r^2 h$
 $\Rightarrow \frac{2}{3}\pi 7^3 = \frac{1}{3}\pi 7^2 h$
 $\Rightarrow 14 = h$
Height of the cone = 14 cm .
41. (c) Number of Metallic Spheres
 $= \frac{\text{Volume of Cylinder}}{\text{Volume of Sphere}} = \frac{\pi R^2 H}{\frac{4}{3}\pi r^3}$
 $= \frac{3R^2 H}{4r^3} = \frac{3 \times 4 \times 4 \times 18}{4 \times 3 \times 3 \times 3} = 8$
42. (c) Let the breadth of the wall be x , height be $6x$ and length be $3x$.
Volume = Length $\times$ Breadth $\times$ Height
 $\Rightarrow 23958 = 3x \times x \times 6x$
 $\Rightarrow x^3 = \frac{23958}{18} = 1331$
 $\Rightarrow x = 11$
Thus, breadth of the wall is 11 cm .
43. (c) TSA of cuboid
 $= 2(lb + bh + hl)$
 $= 2(7 \times 5 + 5 \times 9 + 9 \times 7)$
 $= 2(35 + 45 + 63) = 2 \times 143$
 $= 286 \text{ cm}^2$
44. (d) Let breadth = x
then length = $5x$
Area of four walls = $2(l + b)h$
 $\Rightarrow 2(5x + x)8 = 720 \text{ m}$
 $\Rightarrow 96x = 720 \text{ m}$
 $\Rightarrow x = 7.5 \text{ m}$
 $\therefore$ Breadth = 7.5 m and Length = 37.5 m
TSA of cold Storage = $2(lb + bh + hl)$
 $= 2(37.5 \times 7.5 + 7.5 \times 8 + 8 \times 37.5)$
 $= 2(281.25 + 60 + 300)$
 $= 2 \times 641.25$
 $= 1282.5 \text{ m}^2$
45. (d) Volume of cone = Volume of all three sphere
 $\Rightarrow \frac{1}{3}\pi R^2 h = \frac{4}{3}\pi(r_1^3 + r_2^3 + r_3^3)$
 $\Rightarrow R^2 h = 4(r_1^3 + r_2^3 + r_3^3)$
 $\Rightarrow 12^2 h = 4(10^3 + 8^3 + 6^3)$
 $\Rightarrow 144h = 4(1000 + 512 + 216)$
 $\Rightarrow h = \frac{4 \times 1728}{144} = 48$
Slant height, $l = \sqrt{12^2 + 48^2}$
 $= \sqrt{144 + 2304}$
 $= \sqrt{2448} = 49.48$
CSA of cone = πRl
 $= 3.14 \times 12 \times 49.48 = 1864.4064$
 $= 1864.41 \text{ cm}^2$
46. (a) Here, The cylinder is converted into 3 cones of the same height radius.
So their, volume will be equal.
Volume of cylinder = $3 \times$ volume of cones
 $l = \sqrt{6^2 + 8^2} = \sqrt{36 + 64}$
 $= \sqrt{100} = 10 \text{ cm}^2$
CSA of all three cones = $3 \times \pi r l$
 $= 3 \times \pi \times 6 \times 10 = 180\pi \text{ cm}^2$

47. (c) $h_1 : h_2 = 1 : 5$
 $P_1 : P_2 = 5 : 3$
 $r_1 : r_2 = P_1 : P_2 = 5 : 3$
 $\frac{V_1}{V_2} = \frac{r_1^2 h_1}{r_2^2 h_2}$
 $= \frac{25 \times 1}{9 \times 5} = \frac{5}{9}$
 Thus, ratio of their volume
 $= 5 : 9$
48. (d) Volume of cone $= \frac{1}{3} \pi r^2 h$
 $= \frac{1}{3} \times 3.14 \times 7 \times 7 \times 9$
 $= 461.58$ cubic feet
49. (b) Capacity of the tank $= 64\pi$ liter
 Volume $= 64\pi \times 1000 \text{ cm}^3$
 $\Rightarrow$ Volume of tank $= \pi^2 h$
 $\Rightarrow 64\pi \times 1000 = \pi^2 h$
 $\Rightarrow 64000 = r^2 h$
 As, $r = h$
 $\therefore r^3 = 64000$
 $\Rightarrow r = 40 \text{ cm}$
50. (d) Radius of Hemispherical Bowl
 $R = \frac{18}{2} = 9 \text{ cm}$
 Radius of Cylindrical Bottle
 $r = \frac{6}{2} = 3 \text{ cm}$
 Height of Cylindrical Bottle
 $h = 3 \text{ cm}$
 No. of required Bottles
 $= \frac{\text{Volume of bowl}}{\text{Volume of bottle}}$
 $= \frac{\frac{2}{3} \pi R^3}{\pi r^2 h} = \frac{2R^3}{3r^2 h} = \frac{2 \times 9 \times 9 \times 9}{3 \times 3 \times 3 \times 3} = 18$
51. (c) Area of the base of cone $= 616$
 $\Rightarrow \pi r^2 = 616$
 $\Rightarrow \frac{22}{7} \times r^2 = 616$
 $\Rightarrow r^2 = \frac{616 \times 7}{22}$
 $\Rightarrow r = 14 \text{ cm}$
 Total surface area of the cone
 $= \pi r(1 + r)$
 $= \frac{22}{7} \times 14(20 + 14) = 44 \times 34$
 $= 1496 \text{ cm}^2$
52. (d) Given,
 Radius of hemispherical bowl
 $R = 3 \text{ cm}$
 Radius of cylindrical bottle
 $r = \frac{2}{2} = 1 \text{ cm}$
 Height of cylindrical bottle
 $h = 4 \text{ cm}$
 No. of required bottles
 $= \frac{\text{Volume of bowl}}{\text{Volume of bottle}}$
 $= \frac{\frac{2}{3} \pi R^3}{\pi r^2 h} = \frac{2R^3}{3r^2 h}$
 $= \frac{2 \times 6 \times 6 \times 6}{3 \times 1 \times 1 \times 4} = 36$
53. (a) Let the other parallel sides be l .
 Area of trapezium
 $\frac{1}{2} (\text{Sum of parallel sides}) \times h$
 $\Rightarrow 1785 = \frac{1}{2} \times (42 + l) \times 35$
 $\Rightarrow 42 + l = \frac{1785 \times 2}{35}$
 $\Rightarrow 42 + l = 102$
 $\Rightarrow l = 102 - 42 = 60 \text{ feet}$
 Thus, the length of the other parallel sides $= 60 \text{ feet}$.
54. (a) TSA of cone $= \pi r l + \pi r^2$
 CSA of cone $= \pi r l$
 $\therefore \text{TSA} - \text{CSA} = \pi r^2$
 $= \frac{22}{7} \times 35 \times 35 = 3850 \text{ cm}^2$
55. (a) Base area of cone $= \pi r^2$
 $\Rightarrow 154 = \frac{22}{7} \times r^2$
 $\Rightarrow r = 7 \text{ cm}$
 Again, curved surface area of cone $= 550$
 $\Rightarrow \pi r l = 550$
 $\Rightarrow \frac{22}{7} \times 7 \times l = 550$
 $\Rightarrow l = \frac{550}{22} = 25 \text{ cm}$
 $h = \sqrt{l^2 - r^2}$
 $= \sqrt{25^2 - 7^2} = \sqrt{625 - 49} = \sqrt{576}$
 $= 24 \text{ cm}$
 Volume of cone $= \frac{1}{3} \times \pi r^2 h$
 $= \frac{1}{3} \times \frac{22}{7} \times 7 \times 7 \times 24 = 1232 \text{ cm}^3$
56. (b) Total surface area of cylinder
 $= 2\pi r(r + h)$
 $= 2 \times \frac{22}{7} \times 7(7 + 8) = 660 \text{ cm}^2$
57. (a) Surface Area of sphere $= 4\pi r^2$
 $= 4\pi(5)^2 = 100\pi \text{ cm}^2$
58. (c) Given,
 Curved surface area of cylinder
 $= 2200 \text{ cm}^2$
 Perimeter of base, $2\pi r = 110 \text{ cm}$
 ATQ, CSA of cylinder $= 2\pi r h$
 $\Rightarrow 2200 = 110 \times h$
 $\Rightarrow h = 20 \text{ cm}$
 Thus, height of the cylinder $= 20 \text{ cm}$
59. (a) CSA of cylinder $= 2\pi r h$
 $\Rightarrow 1386 = 2 \times \frac{22}{7} \times r \times 21$
 $\Rightarrow r = \frac{1386 \times 7}{44 \times 21} = 10.5 \text{ cm}$
60. (d) CSA of cylinder $= 2\pi r h$
 $\Rightarrow 70\pi = 2\pi r \times 7$
 $\Rightarrow r = 5$
 TSA of cylinder $= 2\pi r(r + h)$
 $= 2\pi \times 5(5 + 7)$
 $= 120\pi \text{ cm}^2$
61. (b) Net change in area
 $= \left(10 + 10 + \frac{10 \times 10}{100}\right) \% = 21\%$
62. (d) Radius $= 14 \text{ cm}$
 Curved surface area $= 880 \text{ cm}^2$
 $\therefore 2\pi r h = 880$ (h = height of cylinder)
 $= \frac{880 \times 7}{2 \times 22 \times 14}$
 $h = 10 \text{ cm}$
 Volume $= \pi r^2 h$
 $= \frac{22}{7} \times 14 \times 14 \times 10$
 $= 6160 \text{ cm}^3$
63. (c) Volume of cube $= a^3 = 729 \text{ cm}^3$
 Volume of cuboid
 $= 5 \times 13 \times 31 = 2015 \text{ cm}^3$
 Total volume
 $= 2015 + 729 = 2744 \text{ cm}^3$
 Volume of new cube (A^3) $= 2744$
 $A = 14 \text{ cm}$
 Total surface area of new cube
 $= 6A^2$
 $= 6 \times 14^2$
 $= 1176 \text{ cm}^2$

64. (a) One revolution of wheel = $2\pi r$
 12 revolution of wheel = 12×2
 $\times \frac{22}{7} \times 21$ ($\because 2r = 42$ cm)
 $= 72 \times 22 = 1584$ cm = 15.84 m

65. (c) $\therefore \frac{4\pi r^2}{\frac{4}{3}\pi r^3} = \frac{2}{7}$

$$r = \frac{21}{2}$$

$$r = 10.5 \text{ cm}$$

66. (b) $x \times \frac{4}{3} \pi \times (2)^3 = \frac{4}{3} \pi \times (11)^3$

$$x = \frac{11^3}{2^3} = 166$$

67. (c) Volume of cube = $9^3 = 729 \text{ cm}^3$
 Volume of cuboid
 $= 5 \times 13 \times 31 = 2015 \text{ cm}^3$
 Taken = $729 + 2015$
 $= 2744 \text{ cm}^3$
 Volume of new cube (a^3)
 $= 2744$

$$a = 14 \text{ cm}$$

$$\text{Total surface area of new cube}$$

$$= 6a^2 = 6 \times 196 = 1176 \text{ cm}^2$$

$$\text{Total cost of polish of a new cube}$$

$$= 1176 \times 10 = \text{Rs. } 11760$$

68. (a) Total area of room
 $= 2(l + b) \times h + lb$
 $= 2(12 + 8) \times 10 + 12 \times 8$
 $= 400 + 96 = 496 \text{ cm}^2$

$$\text{Total cost}$$

$$= 496 \times 25 = \text{Rs. } 12400$$

69. (a) Volume of cylinder = $\pi r^2 h$

$$\frac{22}{7} \times 14 \times 14 \times h = 6160$$

$$[\because r = 14 \text{ cm}]$$

$$h = \frac{6160 \times 7}{14 \times 14 \times 22}$$

$$h = 10 \text{ cm}$$

$$\text{Curved surface area} = 2\pi rh$$

$$= 2 \times \frac{22}{7} \times 14 \times 10 = 880 \text{ cm}^2$$

70. (c) Volume of a sphere = $\frac{4}{3} \pi r^3$

$$\frac{4}{3} \pi r^3 = 4851$$

$$r^3 = \frac{4851 \times 7 \times 3}{4 \times 22}$$

$$r^3 = \frac{441 \times 21}{8}$$

$$r = \frac{21}{2} \text{ cm}$$

$$\text{Area of a sphere} = 4\pi r^2$$

$$= 4 \times \frac{22}{7} \times \frac{21}{2} \times \frac{21}{2} = 1386 \text{ cm}^2$$

71. (c) Both cylinders capacity volume equal.

$$2r_1 : 2r_2 = 1 : 4$$

$$r_1 : r_2 = \frac{1}{2} : 2$$

$$\frac{\pi r_1^2 h_1}{\pi r_2^2 h_2} = \frac{1}{1}$$

$$\frac{h_1}{h_2} = \frac{r_2^2}{r_1^2} = \frac{(2)^2}{\left(\frac{1}{2}\right)^2} = \frac{16}{1}$$

$$h_1 : h_2 = 16 : 1$$

72. (c) Total area of 4 walls
 $= 2(l + b) \times h$
 $= 2(12 + 8) \times 10$
 $= 400 \text{ cm}^2$

$$\text{Total cost}$$

$$= 400 \times 25 = \text{Rs. } 10000$$

73. (a) Diameter = 84cm (given)

$$\text{Radius} = 42$$

$$\text{One revolution} = 2\pi r$$

$$\text{Wheel go in 16 revolutions}$$

$$= 2 \times \frac{22}{7} \times 42 \times 16$$

$$= 4224 \text{ cm} = 42.24 \text{ m}$$

74. (b) $h = 35$ cm (given)

$$\pi r l = 4\pi r^2$$

$$l = 4r$$

$$l^2 = h^2 + r^2$$

$$(4r)^2 = (35)^2 + r^2$$

$$16r^2 = 1225 + r^2$$

$$15r^2 = 1225$$

$$r^2 = \frac{1225}{15}$$

$$\text{Volume of cone}$$

$$\Rightarrow \frac{1}{3} \pi r^2 h = \frac{1}{3} \times \frac{22}{7} \times \frac{1225}{15} \times 35$$

$$= 2994 \text{ cm}^3 = \frac{2994}{10^6} \text{ m}^3$$

$$= 2994 \times 10^{-6} \text{ m}^3 = 2.994 \times 10^{-3} \text{ m}^3$$

75. (c) 60 disc each of diameter 21cm

$$\text{Thickness} = \frac{1}{3} \text{ cm}$$

$$\text{Radius} = \frac{21}{2} = 10.5 \text{ cm}$$

$$\text{Height} = 60 \times \frac{1}{3} = 20 \text{ cm}$$

$$\text{Volume of cylinder} = \pi r^2 h$$

$$= \frac{22}{7} \times 10.5 \times 10.5 \times 20$$

$$= 693 \text{ cm}^3 = 6.93 \times 10^{-3} \text{ m}^3$$

$$\text{Note : In this question,}$$

$$\text{We can check the divisibility of (11 and 7)}$$

$$\text{So, its only } (6.93 \times 10^{-3} \text{ m}^3) \text{ is divisible by both (11 and 7)}$$

76. (c) Height of cylinder = 84 cm

$$\text{External Radius of cylinder}$$

$$= \frac{10}{2} = 5 \text{ cm}$$

$$\text{Internal radius of cylinder}$$

$$= \frac{8}{2} = 4 \text{ cm}$$

$$\text{We know,}$$

$$\text{Volume of the cylinder}$$

$$= \pi(R^2 - r^2)h$$

$$= \pi(5^2 - 4^2) \times 84$$

$$= \pi \times 9 \times 84 = 2376 \text{ cm}^3$$

$$= 2.376 \times 10^{-3} \text{ m}^3$$

77. (b)

$$\text{T.S.A} = 2\pi r(r + h)$$

$$\text{C.S.A} = 2\pi rh$$

$$\text{Given,}$$

$$\frac{2\pi r(r + h)}{2\pi rh} = \frac{3}{1}$$

$$= r + h = 3h$$

$$= r = 2h = h = \frac{r}{2}$$

$$= 2\pi r(r + h) = 1848$$

$$= 2 \times \frac{22}{7} \times r \left(r + \frac{r}{2} \right) = 1848$$

$$= 2 \times \frac{22}{7} \times r \times \frac{3r}{2} = 1848$$

$$= r^2 = 196 = r = 14 \text{ cm}$$

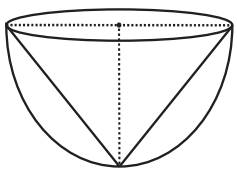
$$h = \frac{r}{2} = \frac{14}{2} = 7 \text{ cm}$$

$$\text{Volume of cylinder}$$

$$= \pi r^2 h = \frac{22}{7} \times 14 \times 14 \times 7$$

$$= 4312 \text{ cm}^3$$

78. (b) $R = 8\text{cm}$
 $h = 15\text{cm}$
 $l^2 = r^2 + h^2$
 $l^2 = 64 + 225$
 $l = 17\text{ cm}$
 Total surface area of cone
 $= \pi r(r + l)$
 $= \pi \times 8(8 + 17)$
 $= \pi \times 8 \times 25$
 $= 200\pi$
79. (d) A.T.Q.,
 $\frac{4}{3}\pi r^3 = \pi r^2 h$
 $\frac{4}{3} \times \frac{84 \times 84 \times 84}{1000} = 12 \times 12 \times h$
 $= h = \frac{49 \times 84}{250}$
 $= h = 5.488 \approx 5.5\text{ cm}$
80. (b) Radius = $\frac{30}{2} = 15\text{cm}$
 $\frac{1}{3}\pi r^2 h = 600\pi$
 $\frac{1}{3} \times 15 \times 15 \times h = 600$
 $h = 8$
 $R = 15$
 $l = + \sqrt{(15)^2 + (8)^2} = \sqrt{225 + 64} = \sqrt{289}$
 $= 17\text{ cm}$
 T.S.A of cone = $\pi r(r + l)$
 $= \pi \times 15(15 + 17)$
 $= \pi \times 15 \times 32 = 480\pi\text{ cm}^2$
81. (c) $3\pi r^2 = 1039.5$
 $= 3 \times \frac{22}{7} \times r^2 = 1039.5$
 $r = \frac{21}{2} = 10.5\text{ cm}$
 Volume of Hemisphere
 $= \frac{2}{3} \times \frac{22}{7} \times 10.5 \times 10.5 \times 10.5$
 $= 2425.5\text{ cm}^3$
82. (a) $\frac{4}{3}\pi x^3 = 126 \times \frac{1}{3}\pi \times 3.5 \times 3.5 \times 3$
 $= x^3 = \frac{63 \times 49 \times 3}{8} = \frac{9261}{8}$
 $x = \frac{21}{2} = 10.5\text{ cm}$

83. (c) Volume of sphere = $\frac{4}{3}\pi r^3$
 Volume of cone = $\frac{1}{3}\pi r^2 h$
 $= \frac{4}{3} \times \pi \times 6.3 \times 6.3 \times 6.3$
 $= \frac{1}{3} \pi \times r^2 \times 25.2$
 $= r = \frac{63}{10} = 6.3$, Diameter
 $= 6.3 \times 2 = 12.6\text{ cm}$
 Required ratio = $12.6 : 25.2$
 $= 1 : 2$
84. (a) Volume of cylinder = $\pi r^2 h$
 Ratio of radius of base and height
 $= 2x : 3x$
 $\pi r^2 h = 202.125\text{ cm}^3$
 $\frac{22}{7} \times 2x \times 2x \times 3x = 202.125$
 $= x^3 = \frac{202.125 \times 7}{2 \times 2 \times 3 \times 22}$
 $x = 1.75$
 Radius of cylinder = $2 \times 1.75 = 3.5$
 Height of cylinder = $3 \times 1.75 = 5.25$
 Total surface area of cylinder
 $= 2\pi r(r + h) = 2 \times \frac{22}{7} \times 3.5(3.5 + 5.25)$
 $= 2 \times \frac{22}{7} \times 3.5 \times 8.75 = 192.5\text{ cm}^2$
85. (c) Radius of cone = $R = 12\text{ cm}$
 Curved surface area of cone = $\pi r l$
 $= \pi r l = 156\pi$
 $= 12 \times l = 156$
 $l = 13$
 $l^2 = r^2 + h^2$
 $169 = 144 + h^2$
 $h = 5$
 Volume of cone = $\frac{1}{3} \times \pi \times r^2 \times h$
 $= \frac{1}{3} \times \pi \times 12 \times 12 \times 5 = 240\pi\text{ cm}^3$
86. (a) 
 Volume of cone = $\frac{1}{3}\pi r^2 h$

- Volume of hemisphere = $\frac{2}{3}\pi r^3$
 The radius of the cone and hemisphere be $r\text{ cm}$
 Height of cone = r
 Volume of cone = $\frac{1}{3}\pi r^2 \times r = \frac{1}{3}\pi r^3$
 Volume of hemisphere = $\frac{2}{3}\pi r^3$
 Remaining volume = $\frac{2}{3}\pi r^3 - \frac{1}{3}\pi r^3$
 $= \frac{1}{3}\pi r^3$
 Required % = $\frac{\frac{1}{3}\pi r^3}{\frac{2}{3}\pi r^3} \times 100 = 50\%$
87. (a) Volume of cylinder = $\pi r^2 h$
 $\Rightarrow \frac{22}{7} \times r^2 \times 34 = 5236$
 $\Rightarrow r = 7$
 C.S.A of cylinder = $2\pi r h$
 $\Rightarrow 2 \times \frac{22}{7} \times 7 \times 34 = 1496\text{ cm}^2$
88. (b) A.T.Q.,
 $\frac{1}{3}\pi r^2 h = \pi r^2 h$
 $\Rightarrow \frac{1}{3} \pi \times 18 \times 18 \times 60 = \pi \times 15 \times 15 \times h$
 $\Rightarrow \frac{1}{3} \times 18 \times 18 \times 60 = 15 \times 15 \times h$
 $\Rightarrow h = 28.8\text{ cm}$
89. (b) Volume of tank = 25000 litres
 As we know,
 1000 litres = 1 m^3
 Let the length of the tank be $x\text{ m}$
 Depth of tank = $x \times \frac{1}{5} = \frac{x}{5}$
 Breadth of tank = $x \times \frac{1}{8} = \frac{x}{8}$
 Volume of cuboid = $L \times B \times H$
 $\Rightarrow x \times \frac{x}{5} \times \frac{x}{8} = 25$
 $\Rightarrow x^3 = 5^3 \times 2^3$
 $\Rightarrow x = 10\text{ m (length of tank)}$

90. (b) Length = 88 cm
Width = 11 cm
Height of cylinder = 11 cm
Length will be the circular base of cylinder, So-
 $\Rightarrow 2\pi r = 88$
 $\Rightarrow r = 14$ cm
Volume of cylinder = $\pi r^2 h$
 $\Rightarrow \frac{22}{7} \times 14 \times 14 \times 11 = 6776 \text{ cm}^3$

91. (b) **Formula Used:**

Volume of hemisphere = $\frac{2}{3} \pi r^3$

Volume of cylinder = $\pi r^2 h$

Given,

Diameter = 7 cm

Height = 28 cm

ATQ,

$12 \times$ The volume of a hemisphere

$\Rightarrow$ The volume of a cylinder

$\Rightarrow 12 \times \frac{2}{3} \times \pi r^3 = \pi \times R^2 h$

$\Rightarrow r^3 = \frac{7}{2} \times \frac{7}{2} \times 28 \times \frac{1}{8}$

$\Rightarrow r^3 = \frac{7 \times 7 \times 7}{8} = \left(\frac{7}{2}\right)^3$

$\Rightarrow r = \frac{7}{2} = 3.5$ cm

92. (b) Volume of cube = a^3
Radius of cylinder = $a/2$, Height = a
Volume of cylinder = $\pi r^2 h$
 $= \pi \times \frac{a^2}{4} \times a = 3.14 \times \frac{a^3}{4}$
 $= 0.785 a^3$
Remaining volume of cube
 $= a^3 - 0.785 a^3 = 0.215 a^3$
Required % = $\frac{0.215 a^3}{a^3} \times 100\%$
 $= 21.5\%$

93. (d)
Radius : Height
 $10x : 24x$
 $5x : 12x$
 $l = \sqrt{(12x)^2 + (5x)^2} = \sqrt{169x^2} = 13x$
Curved surface area = $\pi r l$
 $\Rightarrow \frac{22}{7} \times 5x \times 13x = 2502.5$
 $\Rightarrow x^2 = \frac{2502.5 \times 7}{22 \times 5 \times 13} = 12.25$
 $\Rightarrow x = 3.5 = \frac{7}{2}$ cm

We know, Volume of cone = $\frac{1}{3} \pi r^2 h$

$= \frac{1}{3} \times \frac{22}{7} \times 5x \times 5x \times 12x$

$= \frac{1}{3} \times \frac{22}{7} \times 5 \times \frac{7}{2} \times 5 \times \frac{7}{2} \times 12 \times \frac{7}{2}$
 $= 13475 \text{ cm}^3$

94. (c) Given,
Radius of the Sphere = 4 cm.
Let the radius of the cylinder be $3x$.
Height of the cylinder
 $= 2 \times 3x \times \frac{2}{3} = 4x$.
A.T.Q,
Volume of cylinder = Volume of sphere
 $\Rightarrow \pi r^2 h = \frac{4}{3} \pi r^3$
 $\Rightarrow 3x \times 3x \times 4x = \frac{4}{3} \times 4 \times 4 \times 4$
 $\Rightarrow x = \frac{4}{3}$
We know,
Curved surface of cylinder = $2\pi r h$
 $= 2 \times \pi \times (3x) \times (4x)$
 $= 2 \times \pi \times 3 \times \frac{4}{3} \times 4 \times \frac{4}{3}$
 $= \frac{128}{3} \pi \text{ cm}^2$

95. (a) Volume of cylinder = $\pi r^2 h$
Let the radius ratio of two cylinder
be $\frac{r_1}{r_2}$, Volume ratio of two
cylinder $\frac{V_1}{V_2} = \frac{x}{y}$ & Height ratio of
two cylinder $\frac{h_1}{h_2} = \frac{a}{b}$.

Now, $\frac{V_1}{V_2} = \frac{\pi(r_1)^2 h_1}{\pi(r_2)^2 h_2}$

$\Rightarrow \frac{x}{y} = \frac{(r_1)^2 a}{(r_2)^2 b}$

$\Rightarrow \frac{r_1}{r_2} = \sqrt{\frac{xb}{ya}}$

96. (a) Length and breadth of a cuboidal store = $2x : x$
Height of the cuboidal store (h) = 3.5m
Area of four wall = $2(l + b) \times h$
 $\Rightarrow 2(l + b) \times h = 210$
 $\Rightarrow 2(2x + x) \times 3.5 = 210$
 $\Rightarrow 3x = 30$
 $\Rightarrow x = 10$
Volume of cuboidal store = $l \times b \times h$
 $= 2x \times x \times 3.5$
 $= 7 \times 10 \times 10$
 $= 700 \text{ m}^3$





DATA INTERPRETATION

23

प त स्रअ ह अ

1. Study the given data and answer the question that follows.

किसी सी शहरी जरी नं खखी जै ि सी नरपी यैती किसी सी वष्यी जर िरि कैि सद

The data shows the number of candidates (in thousand) appearing for Civil Service (CS) and Engineering Service (ES) Examinations in the years 2020, 2021, 2022 in USA.

शहरी खखसो (USA)ी, ई इसमलली मलमी मलमी, ई दिी 0ी दूर (CS)ी नरपी १२ यिख 2ी दूरी (ES)ी, इसन रे जी 10 सी, ि, अी प्रषा री, ई कूर रे जैी द2खी एर। री, ई कूर रे प्र

Year	Civil Service		Engineering Service	
	Total No. of Candidates Appeared	Graduates out of the total candidates appeared (in %)	Total No. of Candidates Appeared	Graduates out of the total candidates appeared (in %)
2020	75	60	89	57
2021	110	64	118	65
2022	120	80	135	78

What is total number of graduates who appeared for both CS and ES together in the year 2022?

इसमलमी, ई CSी नरपी ESी कूर रे जी 10 सी, ि, अी प्रषा, यर जर जैी जषी द2खी जि यैी प्रष

SSC CPO 03/10/2023 (Shift-01)

- (a) 2,01,000 (b) 2,01,200 (c) 2,01,100 (d) 2,01,300
2. Study the given data and answer the question that follows.

किसी सी शहरी जरी नं खखी जै ि सी नरपी यैती किसी सी वष्यी जर िरि कैि सद

The tables shows the number of candidates (in lakh) appearing in an entrance exam from four different cities and the ratio of candidates passing and failing in the same.

नरपी जर तरी न0 उन0 ी प्रष रे दी सजी वू षरे, इसी, ई, ि, अ प्रषा री, ई कूर रे जैी द2खी ए0 री, ई नरपी द ई री, अिनर न यरि)सप्रषा री, ई कूर रे जर न यरुी कूर रे प्र

City	A	B	C	D
Number of candidates	2.15	1.14	1.56	2.35

Ratio of candidates passing and failing within the city.

प्रषा री जी गैरु री री)सिनरपी न यरै)सप्रषा री, ई कूर रे जर न यरुी

City	Passing	Failing
A	4	2
B	5	3
C	6	4
D	4	6

What is the number of failed candidates (in lakh) in city D?

D प्रषा री, इन यरि)सप्रषा री, ई कूर रे जैी द2खी ए0 री, ई जि यैी प्रष

SSC CPO 03/10/2023 (Shift-01)

- (a) 1.70 (b) 1.85 (c) 1.25 (d) 1.41
3. The following table represents the population of four different areas and the percentage of males, females, and children P among them.

यिप्यी नरपी जर तरी न0 उन0 ी इसी जैी। यद2खी नरपी य ई द प्रषा री, प्रि0 स रे सू ई कूर रे जर वरि प्री कूर रे प्र

Area	Population	Males	Females	Children
P	10,000	40%	40%	20%
Q	20,000	30%	40%	30%
R	16,000	50%	30%	20%
S	18,000	45%	35%	20%

What is the total number of children in areas P and Q together?

इसी पी नरपी Qी ि 0 स रे ई कूर रे जैी जषी द2खी जि यैी प्रष

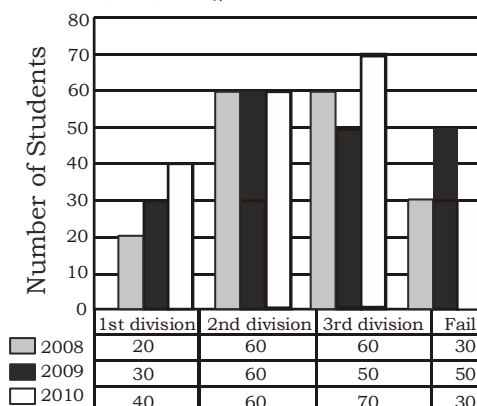
SSC CPO 03/10/2023 (Shift-01)

- (a) 7000 (b) 6000 (c) 8000 (d) 9000
4. Study the given bar-graph and answer the question that follows.

किसी सी वष्यी नरपी जर नं खखी ज ई नरपी यिप्यी ि नी वष्यी जर िरि क

The bar-graph shows the higher secondary students of a school for the years 2008, 2009 and 2010.

यैती किसी सी वष्यी नरपी, ई सजी, जषी जी, इसमलली मलली नरपी मला ले जी खी, रंख जी 3 रंखी जरि कूर रे खी प्रष



The percentage of students who passed in the second division in the year 2010 was:

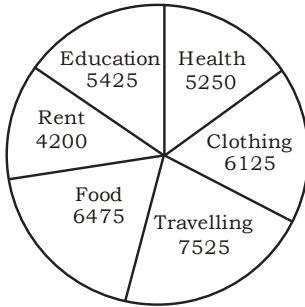
इसमलली, ई नै खे, री, ई री)सप्रषा री, ई 3 रंखी जरि कूर रे जि यरि अरु

SSC CPO 03/10/2023 (Shift-01)

- (a) 28% (b) 32%
(c) 25% (d) 30%

5. What is the central corresponding to the expenditure spent on Education in the given figure?

किसी सी. रू. तहत खर्च के विवरण को देखते हैं। निम्नलिखित में से सही जवाब चुनें।

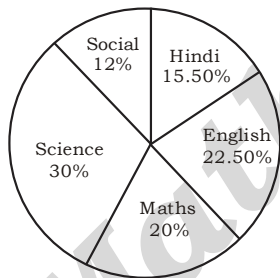


SSC CPO 03/10/2023 (Shift-01)

- (a) 42° (b) 52°
(c) 55.2° (d) 55.8°

6. The given pie-chart shows the distribution of the marks scored by Ram in five different subjects (in percentage).

किसी छात्र राम द्वारा पाँच विषयों में अंकों का वितरण (प्रतिशत) निम्नलिखित पाइ-चार्ट में दर्शाया गया है।



What is the ratio of the central angle of Maths of the central angle of Science?

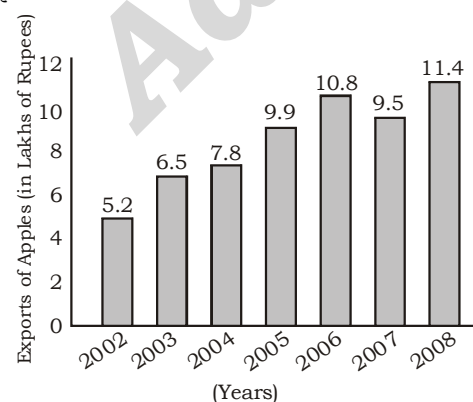
मैथ्स के केंद्रीय कोण का सापेक्ष Science के केंद्रीय कोण का क्या है?

SSC CPO 03/10/2023 (Shift-01)

- (a) 5 : 2 (b) 2 : 3
(c) 4 : 3 (d) 3 : 5

7. Study the given graph carefully and answer the question that follows.

किसी सी. रू. में वर्षों के अनुसार निर्यात के आँकड़ों को निम्नलिखित बार ग्राफ में दर्शाया गया है।



In which year was there maximum percentage increase in the export of apples to that of the previous years?

निम्नलिखित वर्षों में से निर्यात के आँकड़ों में अधिकतम प्रतिशत वृद्धि किस वर्ष हुई?

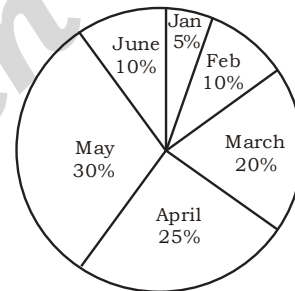
SSC CPO 03/10/2023 (Shift-01)

- (a) 2006 (b) 2005
(c) 2003 (d) 2008

8. Darjeeling gets tourists from two countries A and B. Percentage wise distribution of the influx of tourists is given below for the first six months of the year.

दार्जीलिंग दो देशों A और B से पर्यटकों को आकर्षित करता है। वर्ष के पहले छह माहों में पर्यटकों के प्रवाह का प्रतिशत वितरण निम्नलिखित तालिका में दिया गया है।

Total number of tourists = 60000	
Month	Ratio (A : B)
Jan	5 : 7
Feb	6 : 7
Mar	3 : 2
April	8 : 7
May	4 : 5
June	3 : 4



Find the ratio of tourists from country A coming in During March and April.

मार्च और अप्रैल के दौरान देश A से आने वाले पर्यटकों का अनुपात क्या है?

SSC CPO 03/10/2023 (Shift-01)

- (a) 7 : 10 (b) 9 : 10
(c) 3 : 7 (d) 4 : 7

9. The following data gives a year-wise outlay (in lakhs of rupees) in a certain 4-year plan (2018-2022) of a state

निम्नलिखित आँकड़ों से एक राज्य के 4-वर्षीय योजना (2018-2022) में वार्षिक व्यय (लाखों रुपये में) का पता चलता है।

Year	Health	Housing	Transport	Education
2018-2019	6200	6500	7100	8000
2019-2020	7000	6600	7200	8100
2020-2021	7300	6800	7400	8200
2021-2022	7400	7000	7500	8400

What was the percentage increase during 2020-2021 over 2018-2019 in Education outlay?

2020-2021 के दौरान 2018-2019 के शिक्षा व्यय में प्रतिशत वृद्धि क्या थी?

SSC CPO 03/10/2023 (Shift-01)

- (a) 2.8% (b) 2.5%
(c) 3.2% (d) 2.0%

10. The table given below shows the number of products sold by 4 shopkeepers A, B, C and D on four different days.

यिप्यीन री० जरी नी न० उन० ी द०अस रे A, B, C नरपी डी. रे रे गिर्य रे रे ज. नरपी खी जै द०खी जरी कसरी प्र

Days/Person	A	B	C	D
Monday	1000	800	-	750
Tuesday	500	-	900	650
Wednesday	800	1000	700	-
Thursday	-	1200	800	900

If the total products sold by A and B, including all four days, is 3000 and 3500, respectively, the products sold by B on Tuesday is how many more or less than the products sold by A on Thursday?

खकी दगरी तरी किय रे ० खी आ नरपी डी ७ रे क्षी सी ज ० खी ट. रे ललली नरपी लं ली प्रे रे डी ७ रे. २०० रे जरी क्षी सी ० खी आ ७ रे ० रे जरी क्षी सी ० खी डी जि यी नडिज खी ज. प्र

SSC CPO 03/10/2023 (Shift-02)

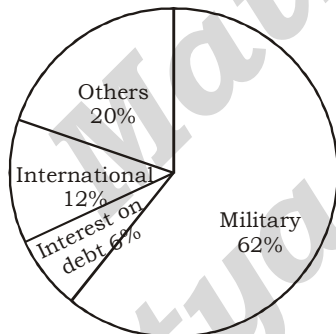
- (a) 200 less (b) 300 more
(c) 300 more (d) 300 less

11. Study The the given pie-chart and answer the question that follows.

किसी सी. सतत रहसजरी नं खखी जै ि सी नरपी यिप्यी० िनी वषी जरी रिी कै सद

Pie-chart shows the National Budget Expenditure in the year 2019.

सतत रहे इक्षमला ८१. रे खहेतवे ६. ही. खखी जरी कसरी प्र



Percentage Distribution

If Rs. 850 billion were spent in year 2019 for interest on debt and military, then what would have been the total expenditure for that year (in Rs.billion)?

खकी इक्षमला ८१. रे ० रे. ी खखी नरपी दगरी जी ० सी ५ लक्षे कि० ख (तक्षिसी सी प्ररी रे रे डी इक्षजी ० सी जषी. खखी एक्षे कि० ख. जी जि यरी प्र रे च

SSC CPO 03/10/2023 (Shift-02)

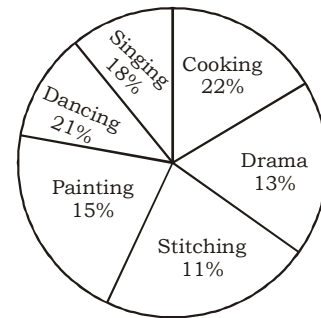
- (a) 1,450 (b) 1,300
(c) 1,700 (d) 1,250

12. Study the given pie-chart and answer the question that follows.

किसी सी. सतत रहसजरी नं खखी ज. रे नरपी यिप्यी० िनी वषी जरी रिी क

The pie-chart shows the percentage of 3600 students enrolled in different hobby classes in a school

यिप्यी. सतत रहसजरी, जषी. रे गिर्यी प्रक्षी जखस रे. रे यर खज ललली रे ३ रेअखी जी वरि रेरी जरी कसरी प्र



The number of students enrolled in Painting classes is approximately what percentage of those enrolled in Singing classes?

हि० जखस रे. रे यर खजनी रे ३ रेअखी जै द०खी दि० २१ जखस रे. रे यर खजनी रे ३ रेअखी जै द०खी जी ० गरी जि यरी वरि रेरी जा ६ रे प्र

SSC CPO 03/10/2023 (Shift-02)

- (a) 108% (b) 83%
(c) 98% (d) 78%

13. Study the given table and answer the question that follows.

कै. श्रेरी री० जरी जरी नं खखी जै ि सी नरपी दजी क्षकी किसी सी. य जरी रिी कै सद

The table shows the number of students doing various courses in various cities.

न री० जरी रे गिर्यी प्य रे. रे गिर्यी जखसज यी. री रे ३ रेअखी जै द०खी कसरी प्र

City	MBA	MCA	M.Sc.	M.Com.	M.A.	Total
Ahmedabad	1234	1384	1440	1289	1332	6679
Bengaluru	1156	1783	1874	1003	1340	7156
Bhopal	1187	1347	1532	1321	1486	6873
Chennai	1342	1473	1129	1765	1666	7375
New Delhi	1230	1098	1128	1865	1777	7098
Hyderabad	1456	1234	1556	1653	1789	7688
Kolkata	1239	1785	1865	1504	1762	8155

In Chennai, the number of students in MBA is nearly what percentage of students in M.A? (rounded off to 2 digits after decimal)

तयक्ष रे MBA. रे ६ सरे जै द०खी M.A. रे ६ सरे जै द०ख जरी ० गरी जि यरी वरि रेरी प्र एकर ०.०० जी क्षकी मो नखरे न ज रेखन

SSC CPO 03/10/2023 (Shift-02)

- (a) 92.12% (b) 80.55%
(c) 76.25% (d) 99.23%

14. The given table shows marks obtained by four students in four subjects.

कै. श्रेरी री० जरी तरी ६ सरे ७ रे रे रेखी. रे. नी नखरे जरी कसरी प्र

Subjects Student	Maths (100)	English (100)	Sciece (100)	Hindi (100)
A	75	80	75	85
B	80	70	70	80
C	70	85	85	75
D	85	75	80	70

The average percentage of marks obtained by all students in Hindi is:

दशरूपी 6 सस्ये 77 री प्रिक्तो, ऐ क्की न ज्ञाये जरी न खखी, क्कि षरी जिन यरी प्रष

SSC CPO 03/10/2023 (Shift-02)

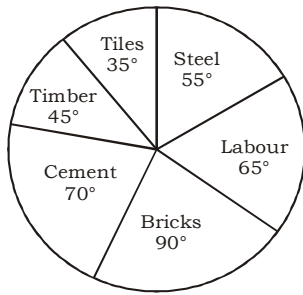
- (a) 77.6% (b) 77.5%
(c) 77.0% (d) 77.8%

15. Study the given pie-chart and answer the question that follows.

क्की सी, सस्यत सस्यजरी न खखी जै ि सी नरपी यिप्यो िरु, षयी जर िरि कैि सद

The pie-chart shows total expenditure of ₹3,00,00,000 on different items for constructing a flat in a town.

सस्यत सस्ये सजी ज, क्षी, ऐ सजी ह० ही जी यि सरी जी ि० सी ि गिस्यी, क्क ि ₹3,00,00,000 जी जक्की. खखी जर क्कस्यी प्रष



The percentage of the total expenditure on Labour and Timber is:

ि नरपी % सस्यै ० जस्यै, ि जक्की. खखी जर, क्कि षरी जै ि सद

SSC CPO 03/10/2023 (Shift-02)

- (a) $30\frac{5}{9}\%$ (b) $30\frac{1}{9}\%$
(c) $30\frac{1}{3}\%$ (d) $30\frac{7}{9}\%$

Direction: (16-17): Study the given table and answer the question that follows.

कैी श्केर री० जरै जरै न खखी जै ि सी नरपी यैती क्की सी, षयी जर िरि कैि सद

The table shows the production of five types of cars P, Q, R, S and T by a company from the year 1989 to 1994.

कैी श्केर री० जरै सजी ज० यैी 77 री, सस्य 1858 ि 188 री न जी, स वजरी जै ० जर ऐ P, Q, R, सी नरपी टी जी, ि सस्यी जरै क्कस्यी प्रष

Type of Car	1989	1990	1991	1992	1993	1994	Total
P	8	20	16	17	21	6	88
Q	16	10	14	12	12	14	78
R	21	17	16	15	13	8	90
S	4	6	10	16	20	31	87
T	25	18	19	30	14	27	133
Total	74	71	75	90	80	86	476

16. During the period 1989-94, which type of car featured a continuous increase in production?

1858 उ० जी नू ि जी क्कस्यी जिदी, क्करी जैी जरै जी, ि सस्य ि० रस्यी िरि प्रष

SSC CPO 03/10/2023 (Shift-02)

- (a) S (b) P
(c) Q (d) R

17. During the period 1989-94, which type of car featured a continuous decrease in production?

1858 उ० जी नू ि जी क्कस्यी जिदी, क्करी जैी जरै जी, ि सस्य ि० रस्यी जैी प्रष

SSC CPO 03/10/2023 (Shift-02)

- (a) R (b) T
(c) Q (d) S

18. Study the given table and answer the question that follows.

कैी श्केर री० जरै जरै न खखी जै ि सी नरपी यैती क्की सी, षयी जर िरि कैि सद

The table shows the number of cakes sold by four different bakeries months. 4 different

न री० जरै री न० उ० ०, प्रै यरी, ऐ तरै न० उ० ० ि क्कस्यी 77 री क्की सी जक्की जैी द० खरी क्कस्यी प्रष

Month Bakery	August	September	October	November
P	250	241	213	168
Q	175	189	201	122
R	164	145	129	168
S	224	154	184	209

What is the difference between the total number of cakes sold by bakeries Q and S together in September and the total number of cakes sold by bakeries P and R together in November?

द० ि, ऐ क्कस्यी ि नरपी सी 77 री सजदस्यी ि० खरी क्की सी जक्की जैी द० खरी नरपी यू ि, ऐ क्कस्यी ि नरपी री 77 री सजदस्यी ि० खरी क्की सी जक्की जैी द० खरी जी है ती जिन यरी न० प्रष

SSC CPO 03/10/2023 (Shift-02)

- (a) 9 (b) 10
(c) 7 (d) 8

19. The following table shows the percentage of students passing out of four colleges (A, B, C and D) over four years. Study the table and answer the question that follows.

यिप्यो ि (री० री० जरै तरै, सस्य, ऐ तरै जक्की ऐ P, B, सी नरपी D री द० िरि) क्कस्यी, री 6 सस्ये जरै क्क षरी क्कस्यी प्रष न री० जरै जरै न खखी ज० नरपी यिप्यो ि (री० क्कस्यी जरै) िरि क्क

Years	College A	College B	College C	College D
2019	68	78	56	78
2020	72	86	78	82
2021	78	91	82	85
2022	80	87	84	87

In which colleges is the average percentage of passing students over the given four years the least?

क्की सी तरै, सस्य, ऐ जिदी जक्की, ऐ िरि) क्क 6 सस्ये जरै न खखी क्क षरी द० ि प्रष

SSC CPO 03/10/2023 (Shift-3)

- (a) College D (b) College A
(c) College B (d) College C

20. The following table shows the earning of different firms (in Rs. crore) in different years.

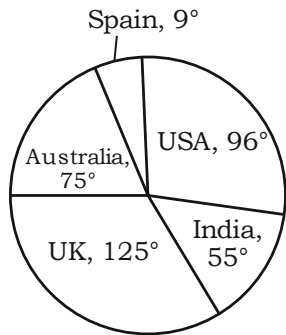
यिप्यो न री० जरै ि गिस्यी, सस्य, ऐ ि गिस्यी, ि है जैी ज० सस्ये जरै ि ख ि क्कस्यी प्रष

Year	2012	2013	2014	2015	2016
Firm					
P	50	45	49	56	57
Q	46	48	50	55	62
R	70	65	63	68	73
S	38	47	56	60	69

The earning (in Rs. crore) of which firm was highest in the year 2015?

The pie-chart is about Country-wise Global Exports Presentation.

एक पाई-चार्ट में विश्व निर्यातों का प्रतिनिधित्व किया गया है।



Total Export = Rs.14400 billion

By how much does the value of the exports of UK exceed that of Australia (in Rs. billion)?

यूके का निर्यात कितना अधिक है ऑस्ट्रेलिया के निर्यात से (रु. बिलियन में)?

SSC CPO 03/10/2023 (Shift-3)

- (a) 2,000 (b) 1,440
(c) 2,550 (d) 1,500

26. Study the given table and answer the question that follows.

कई कंपनियों में काम करने वाले कर्मचारियों की संख्या दी गई है।

The table shows the number of employees in five different organisations A, B, C, D and E in different departments.

पंच विभिन्न विभागों में पाँच विभिन्न संगठनों A, B, C, D और E में कर्मचारियों की संख्या दी गई है।

Dept ↓ Org →	A	B	C	D	E
HR	1050	1015	976	888	1004
Finance	1017	960	786	1025	963
Marketing	1382	1384	1275	1300	1290
Production	1542	1545	4550	1570	1580
Accounts	786	745	801	800	735
Legal	48	54	36	30	53
Total	5825	5703	5424	5613	5625

Which organisation has minimum number of employees?

किसी संगठन में कम से कम कर्मचारियों की संख्या है।

SSC CPO 03/10/2023 (Shift-3)

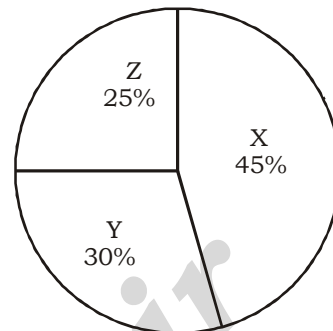
- (a) D (b) B
(c) C (d) E

27. Study the given pie-chart and answer the question that follows.

किसी पाई-चार्ट का अध्ययन करें और निम्नलिखित प्रश्न का उत्तर दें।

The pie-chart shows the number of students (boys and girls) studying in standard 10 of various schools (X, Y, Z in the year 2022).

एक पाई-चार्ट में 2022 में विभिन्न स्कूलों (X, Y, Z) में अध्ययन करने वाले छात्रों (बालक और बालिका) की संख्या दिखाई गई है।
कुल छात्रों की संख्या (बालक और बालिका) = 3600
6 स्कूलों में से एक स्कूल में 0 छात्रों की संख्या = 3600



What is the difference between the total number of students (boys and girls) in school Y and Z together and the total number of students (boys and girls) in school X and Y together?

स्कूल Y और Z में कुल छात्रों की संख्या और स्कूल X और Y में कुल छात्रों की संख्या के बीच अंतर क्या है?

SSC CPO 04/10/2023 (Shift-01)

- (a) 720 (b) 780
(c) 820 (d) 840

28. The following table shows the mobile-addicted population of four different cities Hyderabad, Mumbai, Chennai, and Pune, and the ratio of males to females among them.

निम्नलिखित तालिका चार विभिन्न शहरों में मोबाइल-अडिक्टेड जनसंख्या और पुरुषों और महिलाओं के बीच अनुपात को दर्शाती है।

City	Mobile-Addicted population	Male : Female
Hyderabad	2,20,000	7 : 8
Mumbai	3,50,000	12 : 13
Chennai	2,00,000	11 : 9
Pune	1,50,000	9 : 11

Find the total number of addicted males in Chennai.

- (a) 1,20,000 (b) 1,00,000
(c) 80,000 (d) 1,10,000

SSC CPO 04/10/2023 (Shift-01)

29. Study the given table and answer the question that follows.

कई कंपनियों में काम करने वाले कर्मचारियों की संख्या दी गई है।

The data given in the table is for the month of December 2022.

निम्नलिखित तालिका दिसंबर 2022 के लिए है।

Company	Total no. of employees	No. of female employees
P	4560	2210
Q	4258	1650
R	3052	1280
S	4350	1920

What is the difference between the number of male employees in company P and that in company R?

जुटये P, ते कइ ज. नरखी जौ दइखे नरखी जुटये R, ते कइ ज. नरखी जौ दइखे जौ है तो जरे नरखी जौ जिन यरे प्रश्न

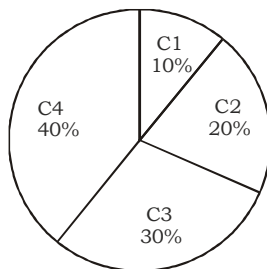
SSC CPO 04/10/2023 (Shift-01)

- (a) 605
(b) 580
(c) 578
(d) 592

30. Study the given graph and answer the question that follows.

किसी सी 4 मे जरे नरखी ज. नरखी यिप्यो (नी वषी जरे) रिी कइ
The given graph represents the percentage of books on different subjects that a person has in his library.
किसी खी 4 मे सजी. खीसी जी. क जरु खी. ते गिस्यी इस्खी.
क जरे जरे वरि चरी कस्खी प्रश्न

Percentage distribution of books on different subjects
गिस्यी इस्खी. क जरे जरे वरि चरी ते र



If the total number of books is 60, then what is the ratio of the number of books on subject C1 to the average number of books per subject?

खी. क जरे जौ जरि दइखी चले प्रेपरि ते इस्खी C1, ते क जरे जौ दइखी जरे वरि ते इस्खी. क जरे जौ नरखी दइखी दो न युक्ती णखी प्रश्न

SSC CPO 04/10/2023 (Shift-01)

- (a) 3 : 5
(b) 2 : 5
(c) 2 : 3
(d) 3 : 7

31. The table below shows the number of students commuting to school by different modes of transport: येती कै श्केरि जरे. ते प्रयी जी गिस्यी दइखी 7र रे, जरि नरखी. री 3 ररि जरे दइखी जरे कस्खी प्रश्न

Modes of transport	School bus	Bicycle	Walking	Other vehicles
No. of boys	80	280	130	200
No. of girls	140	190	90	250

Which mode of transport is used by maximum number of students?

ते 3 ररि जरे नरखी. ते दइखी 7र रे. ते प्रयी जी जिदी दइखी जरे. खी जिखी. री प्रश्न

SSC CPO 04/10/2023 (Shift-01)

- (a) School bus
(b) Other vehicles
(c) Bicycle
(d) Walking

32. The given table shows the number of students from 4 schools during 2022-2023.

कै श्केरि जरे मलमलमलमली जी कस्खी ती, जरि जौ 3 ररि जरे दइखी जरे कस्खी प्रश्न

Schools	Total no. of students	Boys	Girls
A	2060	1339	721
B	1880	1034	846
C	2200	990	1210
D	1680	924	756

What is the percentage of girls in school B?

, जरि बी. ते 0 ररि जरे वरि चरी जिन यरे प्रश्न

SSC CPO 04/10/2023 (Shift-01)

- (a) 60%
(b) 55%
(c) 45%
(d) 65%

33. The sales of batteries (in lakhs) manufactured by a company over the years are shown in the given table. सजी जुटये 7र रे ते जरि जौ इस्खी. ते रिी. ते श्केरि जौ दइखी एर रे. कै श्केरि जरे. ते कस्खी प्रश्न

Year	Types of Batteries						Total
	4AH	7AH	32AH	35AH	55AH	55AH	
1992	75	144	114	102	108	108	543
1993	90	126	102	84	126	126	528
1994	96	114	75	105	135	135	525
1995	105	90	150	90	75	75	510
1996	90	75	135	75	90	90	465
1997	105	60	165	45	120	120	495
1998	115	85	160	100	145	145	605

Which type of battery had the highest total sales over the last seven years?

ते 60 ररि इस्खी. ते जिदी. सरी जौ श्केरि जौ जरि दइखी नरखी ऐच

SSC CPO 04/10/2023 (Shift-01)

- (a) 4 AH
(b) 55 AH
(c) 32 AH
(d) 35 AH

34. Study the given table and answer the question that follows.

कै श्केरि जरे जरे नरखी ज. नरखी येती किसी सी वषी जरे रिी कइ

The table shows the number of students studying in 6 different classes of 6 different schools.

यिप्यो ररि जरे ची न 0 उन 0, जरि जौ ची न 0 उन 0 जइखी. ते ते. री 3 ररि जरे दइखी जरे कस्खी प्रश्न

Schools	V	VI	VII	VIII	IX	X
P	152	160	145	156	147	144
Q	148	166	150	155	157	143
R	161	152	140	145	143	165
S	159	142	149	140	142	168
T	147	144	158	163	154	150
U	150	160	162	160	160	140
Total	917	924	904	919	903	910

Which class has the maximum number of students from all schools together?

दरि, जरि ते 0 ररि जिदी जइखी. ते 3 ररि जरे दइखी ते ररि प्रश्न

SSC CPO 04/10/2023 (Shift-01)

- (a) V
(b) VI
(c) VII
(d) X

35. The pie chart I given below shows the runs scored by a player against 6 different countries during 2019-2020.

येती किसी सी. श्केरि ररि. ते जिदी ते 0 ररि 7र रे. इस्खी 8 उमलमल जी कस्खी ची न 0 उन 0 ते कस्खी जौ ते श्केरि सी. यरे जरे कस्खी खी प्रश्न

Pie chart 2 shows the runs scored by the same player against the same 6 countries during 2020-2021

श्केरि ररि. ते ते ते 0 ररि 7र रे. इस्खी मलमलमली जी कस्खी. ते ते ते कस्खी जौ ते श्केरि सी. यरे जरे कस्खी खी प्रश्न

यिप्यी नरु जरी तरु न० उन० ी इरु. १ तरु न० उन० ी, ह्य ७र रे क्षती सी. ररु०ी, म्पी जौ द०खी जरी करु०ी प्र

Stores	2012	2013	2014	2015
P	178	183	205	225
Q	133	198	220	235
R	284	250	220	198
S	225	243	199	205

Find the difference between the number of mobile phones sold by store Q in 2013 and store S in 2015. मलली, १, ह्यी Qी ७र रे क्षती सी. ररु०ी, म्पी जौ द०खी नरु मलली, १, ह्यी Sी ७र रे क्षती सी. ररु०ी, म्पी जौ द०खी जी क्षे त जरी नरु ी थरी ज ह

SSC CPO 04/10/2023 (Shift-02)

- (a) 7 (b) 8
(c) 12 (d) 10

40. The number of hours spent by a student on different activities as shown in the following pie chart:

यिप्यी, ररुत रहस १ सजी 6 सरी ७र रे गिस्ती नि डिखी, १ क्षि सी स /रु १ जौ द०खी जरी कि सरी खे प्र

Number of hours



The central angle corresponding to the sleeping time is what percentage of the whole central angle?

दरु जी द खे जरी द०नी जहू खे जगरी, बे जहू खे जगरी जरी जि यर वरि ररी प्र

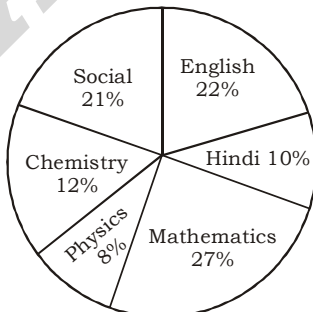
SSC CPO 04/10/2023 (Shift-02)

- (a) 33.33% (b) 50%
(c) 55% (d) 66.66%

41. The following pie chart shows the number of students who failed in different subjects in an examination.

यिप्यीरु, ररुत रहसजी, इरी, १ गिस्ती १ इरु, १ न यरु)रु 6 सरी जौ द०खी जरी करु०ी प्र

Examine the chart and answer the following question. The total number of students who have failed is 350. त रहसजी नू 0 ररु जी जौ सी नरु यिप्यी (नी वरु जी री कैि सद न यरु)रु 6 सरी जौ जहू द०खी ले प्र



The number of students failed in mathematics is less than the number of students failed in all other subjects by:

री, १ न यरु)रु 6 सरी जौ द०खी न नखे दगरी १ इरु, १ न यरु)रु 6 सरी जौ द०खी दी जि यी जौ प्र

SSC CPO 04/10/2023 (Shift-02)

- (a) 95 (b) 256
(c) 190 (d) 161

42. Study the given table and answer the question that follows.

कैि ररु नरु जरी जरी न खखी जौ सी नरु यैती किसी सी वरु जी री कैि सद

The table shows the number of people who responded to a survey about their favourite style of music.

नरु जरी यी 0 ररु जौ द०खी करु०ी प्रमि म्पी द०नी जौ नू यै द०करी ररु जी क्षी, १ सजी दू ररु, १ वरि टि खी कैि प्र

Age	18-20	21-30	31+
Classical	5	5	15
Pop	5	11	10
Hip-Hop	6	9	8
Rock	9	7	13
Total	28	32	46

What percentage of the total sample indicated that Rock is their favourite style of music (rounded off to 2 decimal places)?

दू ररु)रु जि सी जहू 0 ररु जी जि यी वरि ररी यी द०नी किखी प्र जि यजौ, द०करी ररु, ररु द०नी प्रम एकी कर 0.००, अरु न ज वरु ररु

SSC CPO 04/10/2023 (Shift-02)

- (a) 29.65% (b) 8.25%
(c) 27.36% (d) 22.35%

43. Study the pie-chart given below, and answer the question that follows.

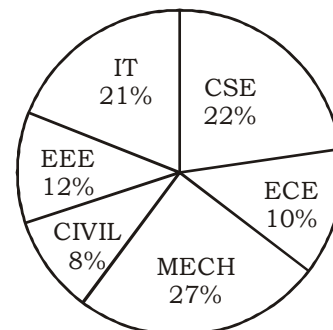
यैती किसी सी, ररुत रहसजी न खखी जौ सी नरु यिप्यी (नी वरु जी री कैि सद

Percentage-wise break up of students in terms of specialisation in B Tech

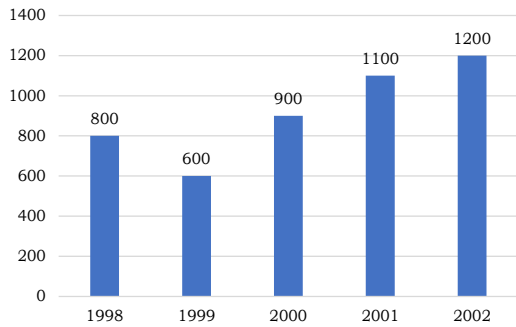
क्षे हजी, १ ररु ररु जी द०खी १ 6 सरी जरी वरि ररी क्षी १ ररु

Total Numbers of Students = 6700

6 सरी जौ जहू द०खी = 6700



What is the total number of students having specialisation in CSE, ECE and CIVIL?



What was the average number of bicycles produced at the factory per year from 1998-2002?

1885उमलमी न जी वकी, इसीजर (सो. १) दृ रकी दरुजि० ये जै न खरु दइखी गखी अच

SSC CPO 04/10/2023 (Shift-3)

- (a) 940 (b) 920
(c) 880 (d) 960

49. In a megastore, the following data reveals the units purchased during the years.

सजी, 1. र. हरी, १० यिप्यो (िनी शहरी दी, इसीजी कस्यो (१) कै शीजखरु जरी नरी त० नरी प्र

What is the percentage growth in total units purchased (of all the three products) from 2015 to 2020?

मलौ दी मलमी न जी (१) कै शीजखी जखरु ए यरी दृ खी जै वो. १ वकी धरी, शिरी गखी प्र

Year	Tea	Coffee	Cold drink
2015	650	450	1008
2016	730	402	1092
2017	710	354	770
2018	570	438	812
2019	820	390	1043
2020	830	501	1330

SSC CPO 04/10/2023 (Shift-3)

- (a) 26.23 % (b) 21.68 %
(c) 22.75 % (d) 25.76 %

50. Study the given table and answer the question that follows.

कौ शी री जरी जरी न खखी ज नरी यिप्यो (िनी वयी जरी) री व
The table shows the percentage population of four states below poverty line and proportion of male to female.

न री जरी तरु रःखी जै (१) कै (१) दी यैती जै वकी धरी। यदइखी नरु बखी दी, प्रि० सरी नरी न युवरी कस्यो प्र

State	Percentage of population below poverty line	Proportion of male to female	
		Below poverty line	Above poverty line
		Male : Female	Male : Female
P	28	3 : 2	7 : 3
Q	15	4 : 7	6 : 5
R	24	5 : 3	3 : 3
S	13	2 : 5	1 : 3

If the total population of state R is 26,000, then what is the number of females above poverty line in state R?
खकी, रुखी री जै वकी। यदइखी मले लकी प्रेपे नरी, रुखी री, १, १ है (१) दी वकी, प्रि० सरी जै दइखी जि यै प्र

SSC CPO 04/10/2023 (Shift-3)

- (a) 9,560 (b) 9,950
(c) 9,880 (d) 9,780

51. Study the given table and answer the question that follows.

कौ शी री जरी जरी न खखी ज नरी यिप्यो (िनी वयी जरी) री व

The table shows the number of employees in five different organisations A, B, C, D and E in different departments.

न री जरी, खी न० उन० दी दइयरी A, B, C, D नरी एी, १ री गिप्य री गस री, १ ज, लरु खी जै दइखी कस्यो प्र

Dept ↓ Org →	A	B	C	D	E
HR	1050	1015	976	888	1004
Finance	1017	960	786	1025	963
Marketing	1382	1384	1275	1300	1290
Production	1542	1545	4550	1570	1580
Accounts	786	745	801	800	735
Legal	48	54	36	30	53
Total	5825	5703	5424	5613	5625

Which department has a minimum number of employees in each organisation?

वखकी दइयरी, १ जिदी री गस री, १ ज, लरु खी जै नख, दी दइखी प्र

SSC CPO 04/10/2023 (Shift-3)

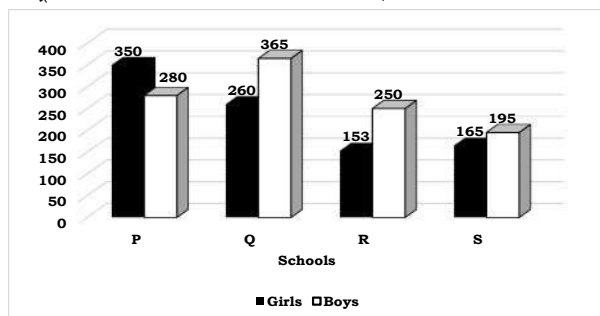
- (a) Production/ दृ खरु
(b) Legal/जखरु
(c) Accounts/(री
(d) Marketing/रु)खरु

52. Study the given graph and answer the question that follows.

किसी सी री जरी न खखी ज नरी यिप्यो (िनी वयी जरी) री व

The graph shows data regarding number of boys and girls studying in class 5 in four different schools.

रु मे तरु न० उन० दी, जखरी, १ जखरी, १, १ री री ० री जखरी जै दइखी दी दइखी शहरी कि ररी प्र



What is the difference between total number of boys studying in school P and Q together and the total number of girls in the same schools together?

जहाँ पी नरपी Q। ऐ ट्रयो री 0 एजरेजौ जहाँ दरेखे नरपी द सी, जहाँ ऐ ट्रयो री 0 एजरेजौ जहाँ दरेखे जी है ती जि यरी नरपी प्रष

SSC CPO 04/10/2023 (Shift-3)

- (a) 40 (b) 35
(c) 45 (d) 38

53. The monthly budget of an average household is given in the following table.

सजी नरपी ट्रयो जरी, रदजौ क्षा ही यिप्यो (नोनरी जरी, ऐ किख खी प्रष

Category	Food	Clothing	Rent	Savings
Amount	8000	2000	6000	4000

The percentage of the monthly budget spent on clothing is:

जु एरे, रदजौ क्षा ही (तीजरी वरि षरी प्रष

SSC CPO 04.10.2023 (Shift-3)

- (a) 12% (b) 4%
(c) 8% (d) 10%

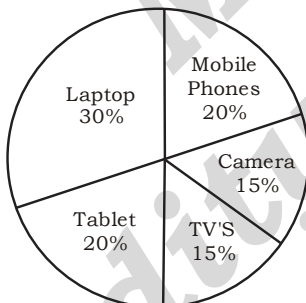
54. Study the given graph and answer the question that follows.

किसी सी जु मे जरी न खखी जै ि सी नरपी दजौ क्षकी, सी सी वष्य जरी िरि कैि सद

The following graph shows the distribution of the cost percentage of different items.

यिप्यरिजनी जु मे ि गिस्ती, नरपी जी 0 रनी वरि षरी जी (रि) जरी कररुषरी प्रष

Cost percentage distribution of different items



If a person purchased all the items for Rs 3,00,000, then the cost of a TV is less than that of a laptop by:

खकी जिदैी. खफि यी दगैरू, नरपी खी ललेलले, ऐ ररै कैरेनरे सज है, जौ 0 रनी 0 पहरुकी जी 0 रनी जौ नरपी, ऐ ररै जौ प्रष

SSC CPO 05/10/2023 (Shift-01)

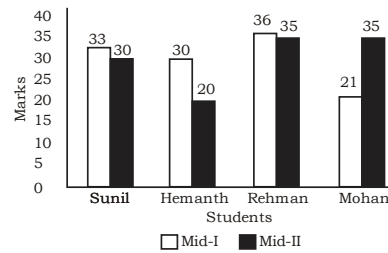
- (a) Rs 55,000 (b) Rs 45,000
(c) Rs 50,000 (d) Rs 40,000

55. Study the given bar graph carefully to answer the question that follows.

किसी सी क्षरी जु मे जरी खखी बखी न खखी जै ि सी नरपी यिप्यो (न वष्य जरी िरि कैि सद

Marks obtained by four students in Mid-I and Mid-II.

ि रडी नरपी ि रडी, ऐ तरी 6 सरी 7र रे वरुनी नरु



Marks obtain by Hemanth in Mid-I are what percentage of the total marks obtained by all the students in Mid-I?

ि रडी, ऐ प्राठी 7र रे वरुनी नरु ि रडी, ऐ दगैरू 6 सरी 7र रे वरु जहाँ नरु जौ जि यी वरि षरी जी क्ष री प्रष

SSC CPO 05/10/2023 (Shift-01)

- (a) 15% (b) 30%
(c) 20% (d) 25%

56. The following table shows the income of a company in a year from various sectors:

यिप्यो (रि) नरु जरी ि गिस्ती एररी दौ सजी, ऐ प्रषजिदैी जु 2 यै जौ नरु जरी कररुषरी प्रष

Sectors	Finance	Communication	Production	Sales	Transportation
Amount (in Lakhs Rs)	85	60	67	115	75

What is the difference (in lakh Rs) between the income from the maximum earning sector and the minimum earning sector?

नडिज, ि ज. ररै, री एररी नरपी नरु, ि ज. ररै, री एररी दौ प्रषा री नरु जी है ती जरी नरु ि ए 0 ररी दरे, ि जि यरी प्रष

SSC CPO 05/10/2023 (Shift-01)

- (a) 30 (b) 55
(c) 40 (d) 48

57. The table below shows the number of laptops sold by the 4 sellers and the ratio of Brand 1 laptops sold to Brand 2 laptops sold.

यै ती कैि ररै री ि ठ सरी 7र रे क्षती सी 0 पहरुकी जौ दरेख नरु क्षती सी क्षरी ि 0 पहरुकी नरपी क्षती सी क्षरी मी 0 पहरुकी जर नरु कररुषरी प्रष

Seller	Total laptops sold	Brand 1 laptops sold: Brand 2 laptops sold
A	4000	3 : 1
B	6000	2 : 1
C	8000	5 : 3
D	5000	1 : 4

The number of Brand 1 laptops sold by A seller is how many more than the number of Brand 2 laptops sold by B seller?

ऐ ि ठ ररी 7र रे क्षती सी क्षरी ि 0 पहरुकी जौ दरेख ि ि ठ ररी 7र रे क्षती सी क्षरी मी 0 पहरुकी जौ दरेखे दौ जि यी नडिजि प्रष

SSC CPO 05/10/2023 (Shift-01)

- (a) 1200 (b) 1000
(c) 600 (d) 800

Selected प्रSelection तथा लसै 235

What is the difference in the number of 7AH batteries sold in 2021 and 2022?

मलमाी नरपी मलममी ऐक्षतौ शैत7AHI क्षतखी जौ दइखी ऐणखी नइी प्रष

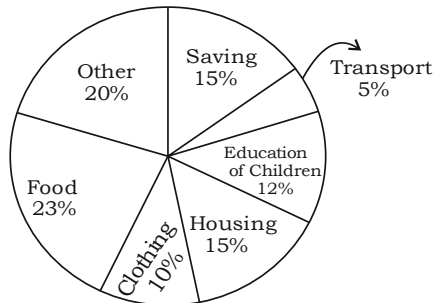
SSC CPO 05/10/2023 (Shift-3)

- (a) 300 (b) 200
(c) 500 (d) 700

73. Study the given pie-chart and answer the question that follows.

किसी सी रक्षत रक्षतजरी नं खखी ज ऐनरपी यिप्योि (नी वषी जरी) रिी क्ख
The pie-chart shows the expenditure of a family on different items and their savings throughout the year 2021.

रक्षत रक्षत इक्षमलमाी जी क्खस्यी गिगस्यी क्खी सजी रूरी जी (तज्ञ नरपी यजौ क्षतनी जरी क्खस्यी प्रष



If the total income for the year was Rs. 1,00,000, then the difference in the expenses (in Rs.) between housing and transport was:

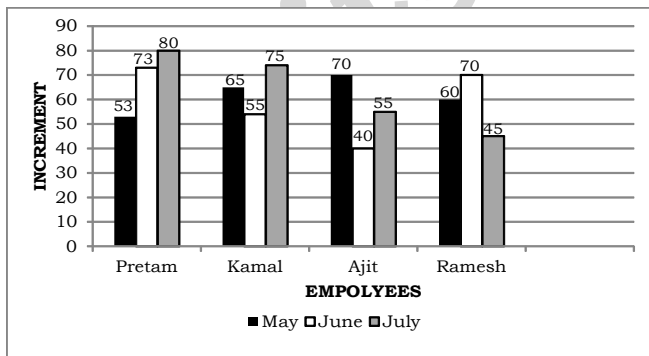
खकी रू इक्षजी 10 सी जक्षी नखी लेलेक्ले रू खे औ नरे नरू रक्षी नरष रू प्रयी जी क्षे ती (तक्षे ऐनइी एरू खे हो अरू

SSC CPO 05/10/2023 (Shift-3)

- (a) 9,500 (b) 10,500
(c) 9,000 (d) 10,000

74. Study the given bar graph carefully and answer the question that follows. Increment of four employees (in Rs.) in the months of May, June and July.

किसी सी क्षरी रू मे जरी खखी बक्षी नं खखी ज ऐनरपी यिप्योि (नी वषी जरी) रिी क्ख शै। यी नरपी। सखी सी ऐतरी ज क्षरखी जौ नय श्री एरू खे इद



What is Kamal's overall average increment in three months?

नै यी प्रै यरी ऐज 01 जौ जक्षी नखी नय श्री णखी प्रष

SSC CPO 05/10/2023 (Shift-3)

- (a) Rs. 60 (b) Rs. 75
(c) Rs. 70 (d) Rs. 65

75. The following table represents the number of scooters sold by 5 stores in 4 different months in the year 2022.

यिप्योि (नी नरपी जरी) इक्षमलमाी ऐनरी नउ उन0 1. प्रै यरी ऐी क्खस्य रररी क्षती सी जक्ष ऐजौ दइखी क्खस्यी प्रष

Stores →	A	B	C	D	E
Months ↓					
January	212	168	173	182	190
February	312	250	212	175	182
March	280	275	265	255	245
April	270	280	290	305	275

Find the ratio between the total number of scooters sold by stores A and B together in January and the total number of scooters sold by stores D and E together in March?

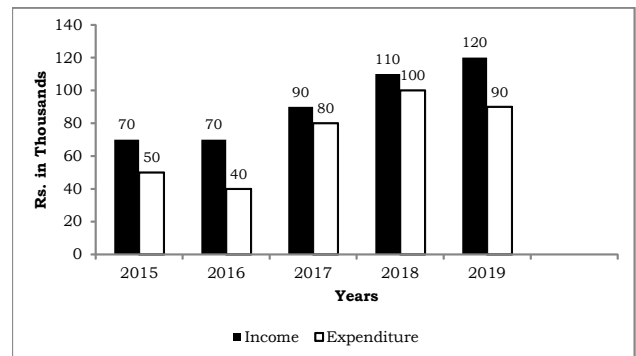
। यूरी ऐ दक्षी AI नरपी BI रररी क्षती सी जक्ष ऐजौ जक्षी दइखी नरष सक्ष ऐ दक्षी DI नरपी EI रररी क्षती सी जक्ष ऐजौ जक्षी दइखी जा क्षे ती नयक्खी थरी जै सि सक्ष

SSC CPO 05/10/2023 (Shift-3)

- (a) 18 : 23 (b) 19 : 25
(c) 17 : 25 (d) 20 : 23

76. The given graph shows the income and expenditure of a family. Study the graph and answer the question that follows.

किली खी रू मे सजी रूरी जौ नखी नरपी खखी जरी क्खस्यी प्रष रू जरी नं खखी ज ऐनरपी यिप्योि (नी वषी जरी) रिी क्ख



The expenditure of the family increased by _____ from 2017 to 2018.

मलौ डी मलसीन जी रूरी जरी (तक्षे _____ क्षरी खक्ष

SSC CPO 05/10/2023 (Shift-3)

- (a) 25% (b) 22%
(c) 20% (d) 11%

77. Study the given table and answer the question that follows.

कौ शैत री जरी जरी नं खखी ज ऐनरपी यिप्योि (नी वषी जरी) रिी क्ख

The table shows the number of employees in three organisations during three years.

Selected प्रSelection तरा लखऔं 238

P1, P2 नरूपी P3. ऐठ. षरी जियी 6 ससरी जरी दक्षदी नडिजी नञ्जि 01 प्रञ्ज

Student	P1	P2	P3
Mohit	79	78	77
Shivam	73	87	80
Vishal	82	74	83
Viraj	77	89	86

SSC CPO 09/11/2022 (Shift-01)

- (a) Viraj, Vishal, Mohit (b) Vishal, Viraj, Viraj
(c) Shivam, Viraj, Vishal (d) Mohit, Viraj, Vishal

Direction (87-89): Study the given table and answer the questions based on it.

किसी सी नरूपी जरी जरी न खखी जै ि सी नरूपी ढी. नी नखरनी. ढयरी जा िरि कैल सद

The percentage marks obtained by 6 students in different subjects are given below. The maximum marks for each subject have been indicated in the table.

ू गिसयी ू इसखी. ऐ ची 6 ससरी 77 री वरुनी वरि षरी नञ्जि यैती किसी सी प्रञ्ज नरूपी जरी. ऐ वज्जनी ू इसखी जी 10 सी नडिजी. नी नञ्जि कससरी सी प्रञ्ज

Subject	Phy.	Maths	Hindi	Geo.	Eng.	His.
Students	80	150	100	75	120	50
Max. Marks						
P	70	44	88	88	70	38
Q	90	40	54	92	65	40
R	85	32	70	64	55	30
S	75	70	58	80	60	35
T	64	60	45	88	50	42
U	60	50	60	72	25	48

87. What is the average marks obtained by all students in Geography?

गखरणी. ऐ दगरी 6 ससरी 77 री. षरी नखनी नञ्जि णखी प्रञ्ज

SSC CPO 09/11/2022 (Shift-01)

- (a) 65.5 (b) 63.8
(c) 60.5 (d) 58.2

88. The total marks obtained by student Q in Physics and Hindi are what percentage (rounded off to the nearest integer) more than the total marks obtained by student T in Geography and History?

6 सरी Q 77 री गससि जी ू थस्यी नरूपी प्रिञ्ज. ऐ षरी जषी नञ्जि गखरणी नरूपी षरि प्रखी. ऐ 6 सरी T 77 री. षरी जषी नञ्जि ढी जियी. षरि एयिजह. ू. षरि जषी नञ्जि षरि नडिजी प्रञ्ज

SSC CPO 10/11/2022 (Shift-02)

- (a) 45 (b) 49
(c) 56 (d) 38

89. What are the approximate percentage marks obtained by student T in all subject together?

6 सरी T 77 री दगरी ू इसखी. ऐ ि 0 सखी. षरी जिसी सी 0 ग. षरि नञ्जि जियी प्रञ्ज

SSC CPO 11/11/2022 (Shift-03)

- (a) 65 (b) 58
(c) 47 (d) 52

90. The following table shows the percentage of marks obtained by five students - V, W, X, Y and Z - in five subjects.

यिप्यी नरूपी जरी. खी 6 ससरी डी V, W, X, Y नरूपी डी डी 77 री. ख ू इसखी. ऐ वरुनी नञ्जि जरी वरि षरी कससरी प्रञ्ज

Subject	Maths	Physics	Chemistry	Botany	Hindi
Maximum Marks	300	300	200	100	100
Students ↓					
V	60	80	90	100	95
W	90	70	80	70	40
X	70	90	95	80	75
Y	80	60	70	75	80
Z	90	80	80	85	85

What are the average marks, in percentage, obtained by X?

X 77 री. षरी जिसी सी नखनी नञ्जि. षरि षरी. ऐ जियी प्रञ्ज

SSC CPO 09/11/2022 (Shift-01)

- (a) 76.5% (b) 80.5%
(c) 82.5% (d) 85.5%

91. The following table shows the number of students of seven colleges participating in extra co-curricular activities.

यिप्यी िरि नरूपी जरी नरिफि. षरि षरी िरि सखी. ऐ गसरी 0 ष. षरी ढरी जखनी ऐ जी 6 ससरी जै ददखी जरी कससरी प्रञ्ज

Read the table and answer the question given.

नरूपी जरी जरी. िसी नरूपी किसी सी. ढयी जरी िरि कैल सद

College →	A	B	C	D	E	F	G
Extra co-Curricular activities ↓							
I	150	250	450	50	350	250	150
II	50	150	150	50	50	50	50
III	100	50	400	125	100	500	150
IV	250	125	350	275	250	150	150

Percentage of the number of students in activity II to that of IV is (consider up to two decimals)

िी डी II ढी ू 3 रिससरी जै ददखी जरी िी िरि IV ढी ू 3 रिससरी जै ददखी ढी. षरि षरी थरी जै ि सवे एकर 0. ू जी करी, असरी न ज ढरी. िरि कैल सद

SSC CPO 09/11/2022 (Shift-01)

- (a) 45.48%
(b) 35.48%
(c) 34.25%
(d) 39.18%

103. What is the average population of village D during all the 4 years?

ढरौरी नूँ इरुई जी कप्रस्यो रूी डी जी न ररुनी । यदइखी जिन यै प्ररु

SSC CPO 10/11/2022 (Shift-01)

- (a) 5295 (b) 5300
(c) 5307 (d) 5315

104. The following table represents the number of computers (numbers in thousands) manufactured by four companies from period 2014 to 2016. Study the table carefully and answer the following question
यिप्यो न री 0 जरी मला ती ढी मला ची जै नू डी । ऐ तरौ जू 2 यिखी 7 र र यि जी जप्खर ऐ जै दइखी एदइखी प्र। र ऐ ढी कप्रस्यो प्ररु न री 0 ज र जरी खरू वरुनी न खरुनी ज ऐ नरुपि यिप्यो िरुई बयो जरी िरि क

year	A	B	C	D
2014	1350	750	630	810
2015	570	520	1280	990
2016	420	1170	650	580

For the year 2014 to 2016, what is the difference (numbers in thousands) between the combined production of computers by companies A and D and the production of computers by companies B and C taken together?

इरुई मला ती ढी मला ची न जी जू 2 यै A नरुपि D 7 र र जप्खर जा दइखी िरु खरुनी नरुपि जू 2 यै B नरुपि C 7 र र सजी दइखी जप्खर जा िरु खरुनी जी कै ती जरी नरुपि एदइखी प्र। र ऐ ढी जिन यरी प्ररु

SSC CPO 09/11/2022 (Shift-02)

- (a) 460 (b) 280
(c) 370 (d) 310

105. The following table shows the number of candidates from different locations, who appeared and passed in a competitive examination over the years.

यिप्यो न री 0 जरी ि गिरुनी, असरु ढी यो ि कूर ऐ जै दइखी कप्रस्यो प्रेपे । री किरु सो इरुई जी कप्रस्यो सजी कै खरुनी िरुई ऐ िरु प्ररु नरुपि िरि कप्रस्यो

Year	Rural		Semi-urban		State capitals		Metropolises	
	App.	Passed	App.	Passed	App.	Passed	App.	Passed
1990	1652	208	7894	2513	5054	1468	9538	3214
1991	1839	317	8562	2933	7164	3248	10158	4018
1992	2153	932	8139	2468	8258	3159	9685	3038
1993	5032	1798	9432	3528	8529	3628	11247	5158
1994	4915	1658	9784	4015	9015	4311	12518	6328
1995	528	2392	9969	4263	1725	4526	13624	6419

What approximate value was the percentage drop in the no. of semi urban candidates, who appeared from 1991 to 1992?

इरुई 1881 ढी 188मी न जी िरु प्ररु न डइखरु िरु कूर ऐ जै दइखी ऐ कै िरु िरु ही जरी 0 ररी स्यो णरुई असु

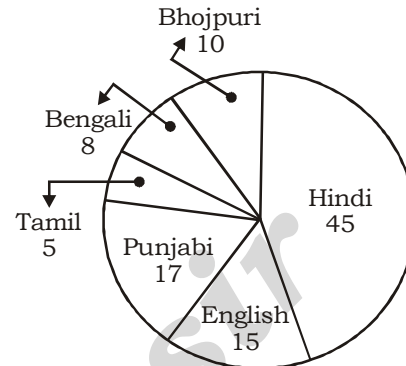
SSC CPO 09/11/2022 (Shift-02)

- (a) 15% (b) 8%
(c) 5% (d) 10%

106. The given pie chart shows the percentage of students who speak different languages in a hostel.

The total number of students in the hostel is 120. किरु खी रुईत रुईसजी 6 ससू रुई ऐ ि गिरुनी गइरुई ६ र यो री 6 ससू जरी कै िरु कप्रस्यो प्ररु 6 ससू रुई ऐ जरु 6 ससू जै दइख 1 मले प्र

Number of Students



What is the ratio of students speak English and Bhojpuri to those who speak Tamil?

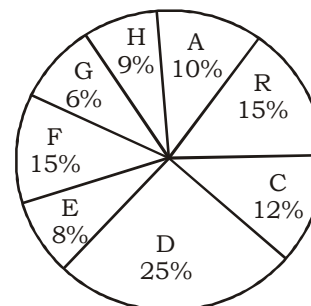
न 2 कै नरुपि गइरुई कै ६ र यो री 6 ससू जरी िरु 0 कै ६ र यो री ५ ससू जरी नरुपि णरुई प्ररु

SSC CPO 09/11/2022 (Shift-03)

- (a) 10 : 3 (b) 1 : 1
(c) 20 : 3 (d) 5 : 1

107. The following pie chart shows the number of workers of different categories A, B, C, D, E, F, G and H of a factory in 1995.

यिप्यो रुईत रुईस 188 ि ऐ सजी ज र ससू जै ि गिरुनी िरुखी A, B, C, D, E, F, G नरुपि H जै िरु जरी जै दइखी जरी कप्रस्यो प्र



If the number of workers in category B is increased by 10% and the number of workers in category D is decreased by 5% in 1996, then what is the total no. of workers in categories B and D in 1996, if number of workers in B was 1500 in the year 1995?

खरुई 188 कै ऐ िरुई ढी ऐ िरु जरी जै दइखी ऐ 1 ली जै िरु जै । रौ प्रेपे नरुपि ऐरु डी ऐ िरु जरी जै दइखी ऐ िरु जै जै । रौ प्रेपे नरुपि 188 कै ऐ िरुई ढी नरुपि डी ऐ िरु जरी जै जरी दइख णरुई प्रेपे खरुई इरुई 1995 ऐ िरुई ढी ऐ िरु जरी जै दइखी िरु ली ऐ च

SSC CPO 09/11/2022 (Shift-03)

- (a) 4025 (b) 4500
(c) 5000 (d) 4000

112. Study the given table and answer the question that follows. The table shows the consumption of various grains by a total of four families of four members each from 2002 to 2005.

कौन से परिवारों में जई का खाना है? इस परिवार के सदस्यों की संख्या क्या है?
 2002 में जई का औसत खाना कितना था और 2005 में औसत खाना कितना था?

Year	Wheat (kg)	Rice (kg)	Oats (kg)	Quinoa (kg)
2002	162	62	131	61
2003	196	80	116	64
2004	187	116	103	46
2005	189	122	101	45

For the total of these four families what is the difference (in kg) between the average consumption per year of wheat and that of oats?

ये चार कुटुंबों के सदस्यों के बीच औसत खाना के अंतर क्या है?

SSC CPO 09/11/2022 (Shift-03)

- (a) 129.5 (b) 90.67
(c) 70.75 (d) 63.5

Direction (113-114): Study the given table and answer the questions that follow.

कौन से विद्यालयों में जई का खाना है? इस विद्यालय के छात्रों की संख्या क्या है?

School Name	Total No. of students Enrolled	Percentage of enrolled students who opted Biology	Ratio of male to female students who opted Biology
A	900	30	7 : 8
B	400	38	9 : 10
C	1000	24	5 : 19
D	800	20	5 : 7

113. Find the number of students who opted Biology in school D.

SSC CPO 09/11/2022 (Shift-03)

- (a) 20 (b) 160
(c) 120 (d) 800

114. Find the ratio of the number of students who opted biology in school B and school D.

विद्यालय B और विद्यालय D में जई का खाना करने वाले छात्रों की संख्या का अनुपात क्या है?

SSC CPO 10/11/2022 (Shift-02)

- (a) 1 : 4 (b) 1 : 2
(c) 1 : 1 (d) 2 : 1

115. Study the following table carefully and answer the questions based on it.

निम्नलिखित तालिका में चार कंपनियों द्वारा 2010 से 2015 तक कारों की बिक्री के बारे में जानकारी दी गई है।

The following table shows the domestic sales of vehicles of four manufacturers from 2010 to 2015

निम्नलिखित तालिका में चार कंपनियों द्वारा 2010 से 2015 तक कारों की बिक्री के बारे में जानकारी दी गई है।

Manufacturer	2010	2011	2012	2013	2014	2015
A	560000	700000	600000	620000	650000	680000
B	540000	590000	570000	630000	710000	650000
C	610000	580000	620000	680000	690000	630000
D	630000	570000	700000	690000	700000	640000

With respect to which of the following combinations, is the sales of vehicles highest over the given period?

निम्नलिखित में से किस संयोजन के लिए कारों की बिक्री का कुल अंतर सबसे अधिक है?

SSC CPO 09/11/2022 (Shift-03)

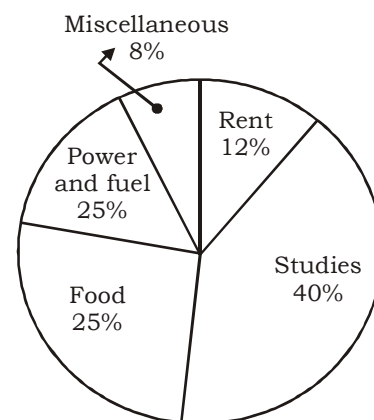
- (a) A, 2011 (b) B, 2014
(c) D, 2012 (d) D, 2014

Direction (116-117): Study the given pie-chart and answer the questions based on it.

किसी व्यक्ति के मासिक व्यय का वितरण निम्नलिखित पाई-चार्ट में दर्शाया गया है।

The percentage distribution of Anil's expenditures is presented in the given pie-chart.

निम्नलिखित पाई-चार्ट में आनिल के मासिक व्यय का वितरण दर्शाया गया है।



116. If Anil's monthly expenditure is ₹ 65,000, how much money does he spend on food and rent?

अनिल का मासिक व्यय ₹ 65,000 है, तो वह भोजन और किराए पर कितना खर्च करता है?

SSC CPO 10/11/2022 (Shift-01)

- (a) ₹ 24,050 (b) ₹ 25,040
(c) ₹ 24,500 (d) ₹ 25,400

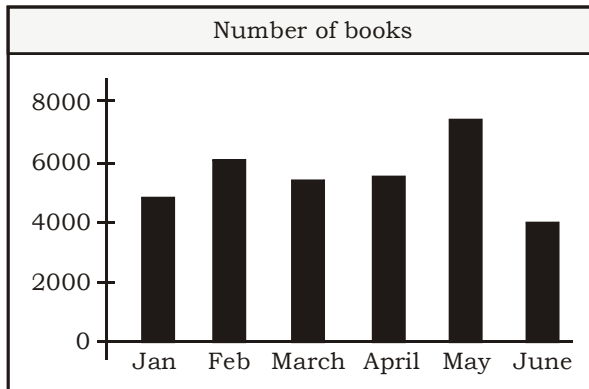
117. What is the corresponding central angle for Anil's expense on power and fuel?

अनिल के बिजली और ईंधन पर व्यय के संगत कोण क्या है?

SSC CPO 11/11/2022 (Shift-03)

- (a) 50° (b) 54°
(c) 55° (d) 52°

118. Number of books issued by a library for 6 months has been represented in the following bar graph.
सजी क जख खे गरी चे, प्रै यी जी 10 सी। रौ जी 9 क जखे जै द2खे जरी यिप्यो 10 री क्षी 3 मे, 1 कसखे खे प्र



In which month the maximum number of books were issued?

जिदी, प्रै यी, 1 दू खिजी, क जखे। रौ जी 9

SSC CPO 10/11/2022 (Shift-01)

- (a) Jan (b) April
(c) May (d) February

Direction (119-120): Study the given bar-graph and answer the questions based on it.

किसी सी क्षर उ 3 मे जरी न खखी जै 10 सी नखी दौ, 1 नखरनी दयरे जा री कै स

The given table represents the population of different villages.

कै 9 री जरी गिस्वी रू रे जै। यद2खे जरी यि 9 री ज नै प्र

Name of the village	Number of males	Number of females
A	1500	1220
B	1460	1320
C	1105	1180
D	1305	1170

119. J : denotes the average number of males in villages A, B and C.

K : denotes the average number of females in village B, C and D.

What is the average of J and K?

J : रू 1 A, B न अरी C, 1 दू खे जै न खनी द2खे कसखे प्र

K : रू 1 B, C न अरी D, 1 प्रो स रे जै न खनी द2खे जरी कसखे प्र

J न अरी K जरी न खनी णखी प्र

SSC CPO 10/11/2022 (Shift-01)

- (a) 1289.17 (b) 1279.62
(c) 1278.36 (d) 1288.62

120. Find the ratio of males to females in all villages.

दगै रू रे, 1 दू खे नखी, प्रो स रे जै न खनी द2खे जरी नयुकी थर जै स

SSC CPO 10/11/2022 (Shift-02)

- (a) 537 : 389 (b) 163 : 179
(c) 179 : 163 (d) 389 : 537

121. The following table shows different types of geysers sold by a company over 6 years (numbers in thousands)
यिप्यजनी न री जरी ची इखे जी कसखी जिदी जू यै गरी क्षी स 1 1 री जै गिस्विगिस्वी जि, 1 एद2खे प्र। र रे, 1 जरी कसखी प्र

Year	Types				
	A	B	C	D	E
2007	75	122	103	98	95
2008	100	102	103	112	102
2009	105	108	112	109	108
2010	100	189	123	102	122
2011	95	123	102	124	124
2012	85	145	134	134	145

Answer the following question based on table:

न री जरी जी न खरी, 1 यिप्यो 10 री क्षी 4 यी जरी री कै स-

The total sales of all the six years are the minimum for which geyser?

जिदी 1 1 री ची इखे जरी जखी 1 ठ खे नख, 1 प्र

SSC CPO 10/11/2022 (Shift-01)

- (a) D
(b) A
(c) C
(d) B

122. The average marks of students in five subjects in class X in a school is given in the table.

यिप्यो न री जरी, 1 सजी, जखी, 1 कदू 1 जखी, 1 खी 1 इखी, 1 6 सखे जी न खनी न खी किसी सी प्र

Year	History (out of 200 marks)	Geography (out of 100 marks)	Mathematics (out of 200 marks)	Science (out of 200 marks)	English (out of 150 marks)
1984	88	46	98	98	60
1985	90	35	120	120	90
1986	100	45	102	102	66
1987	120	38	112	112	45
1988	124	54	96	96	57

The average percentage marks of which of the following pairs of subjects was the same in 1985?

185 री, 1 यिप्यो 10 री क्षी, 1 दी जिदी खी जी 1 इखी जी न खनी, 1 6 न खी द, री आव

SSC CPO 10/11/2022 (Shift-01)

- (a) Geography, Mathematics
(b) Science, Geography
(c) Science, English
(d) English, Mathematics

123. The table shows the percentage of total population of a city in different age groups. Study the table and answer the question.

नरिं जरी गिस्ती नरखी रे. ऐ जिहो प्यो जौ जहो। यदइखी जर
कै परो कसो प्रो नरिं जरी जरी नं खखी ज ऐनरपी कयो रिं क

Age group	Percentage
Up to 15	15.00
16-25	20.25
26-35	16.75
36-45	26.75
46-55	15.00
56-65	5.50
66 and above	1.25

If there are 30 million people below 36 years, then find the number of people (in millions) in the age group (56-65) (consider up to two decimals).

खकी ली इखी जौ नरखी री 0 र ऐ जौ दइखी ली 10 खी प्रेप
नरिं ऐ ची डी वी नरखी री 0 र ऐ जौ दइखी 10 खी. ऐर
जौ सवे एकी कर 0.1, अस्येन जौ ब्रसिन व

SSC CPO 10/11/2022 (Shift-01)

- (a) 1.16 million (b) 3.17 million
(c) 1.87 million (d) 2.17 million

124. Study the following table and answer the question.

यिप्यो रिं नरिं जरी जरी नं खखी ज ऐनरपी कयो जरी रिं क

School	Number of Students scoring marks less than 50%	Percentage of students scoring marks more than 50%	Number of students appeared
A	270	55	600
B	120	40	400
C	300	20	375
D	220	10	350
E	200	25	300

The ratio of total number of students scoring marks less than 50% to that of scoring marks exactly 50% is:

लनी डी जौ नरखी री जौ यो री 6 सरी जौ जहो दइखी नर
द्वे जौ लनी नरखी री जौ यो री 6 सरी जौ जहो दइखी जरी नर
पखी प्र

SSC CPO 10/11/2022 (Shift-01)

- (a) 111 : 12 (b) 111 : 24
(c) 101 : 24 (d) 101 : 12

125. Annual production of four different types of cold drinks has been tabulated below. Which of these cold-drinks has encountered maximum percentage increment in production?

तरी गिस्ती करी जौ जरुशे रिं जरी रइखी रू सरी ये ता
दर रैश्री जिखी खी प्रो य ऐ डी जिहो जरुशे रिं जौ रू स
ऐन डिज. कै परो रिं प्रोप्र

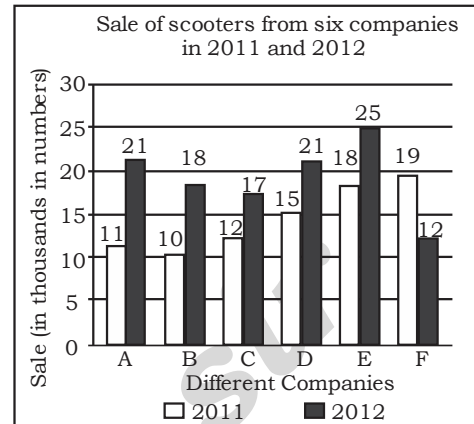
Cold drink	2020 (units)	2021 (units)
Sprite	5400	5800
Cocacola	5300	5600
Pepsi	6000	6800
Fanta	1800	2700

SSC CPO 10/11/2022 (Shift-01)

- (a) Coca-cola (b) Pepsi
(c) Fanta (d) Sprite

126. The following bar graph shows the sales (in thousand numbers) of scooters from six different companies in 2011 and 2012.

यिप्यो रिं क नरखी नरखी मला 10 नरखी मला 10. ऐ 6 प्रो न 0 उन 0
जुयिखी जौ, जहो ऐ जौ रिं ऐ प्रो दइखी. हो जरी कसो प्र



The average sales of companies A and E in 2011 are what percentage of the average sales of companies B and D in 2012?

मला 10. ऐ जुयिखी A नरखी E जौ नरखी रिं मला 10. ऐ B नरखी
D जौ नरखी रिं जरी जि यरी कै परो प्र

SSC CPO 10/11/2022 (Shift-02)

- (a) 65.89% (b) 72.87%
(c) 70.89% (d) 74.36%

Direction (127-129): Study the given table and answer the questions based on it.

किसी सो नरिं जरी जरी नं खखी जौ सो नरखी डी नरखी नरखी जौ
रिं कै सद

The following table shows the number of centuries scored by given five cricketers in the past 5 years.

यिप्यो नरिं जरी 600 ई. ऐ किसी सी खी डिजहो री 7 री क्षसी स
रु जौ जौ दइखी जरी कसो प्र

Years Cricketers	2021	2020	2019	2018	2017
A	1	0	1	0	1
B	1	0	2	1	1
C	1	2	0	0	1
D	0	0	1	1	0
E	0	1	1	0	1

127. In which year the maximum number of centuries were scored?

दू रइजो रु जौ जिहो ई. ऐ क्षसी सी आ

SSC CPO 10/11/2022 (Shift-02)

- (a) 2020 (b) 2018
(c) 2019 (d) 2021

128. Who scored the maximum number of centuries?

दू रइजो रु जौ जिहो क्षसी

SSC CPO 10/11/2022 (Shift-02)

- (a) A (b) C
(c) B (d) E

138. In which subject are the maximum number of teacher males?

जिदी फू इखे, ऐ छिज्जजै न डिज्ज, ि दैखी, बड़ी प्रश्न

SSC CPO 11/11/2022 (Shift-02)

- (a) Mathematics (b) Hindi
(c) Commerce (d) English

139. Study the given table and answer the question.

The marks obtained by four students A,B,C and D in Mathematics, Statistics and Computers are given in the following table.

कौ श्रेष्ठ री जरी जरी न खखी जै ि सी नरपी दजो क्षस्ते, बयी जा
रिी कै स

तरा 6 सस्ते A,B,C नरपी D तरा िरौ दरेखजै नरपी जप्सख

. ऐ स्की न जो यिप्योन री जरी, ऐ किस्ी सी प्रश्न

Students Subjects	A	B	C	D
Mathematics	60	50	70	75
Statistics	70	45	60	80
Computers	80	55	55	75

Who among the students has ranked first on the basis of the total marks obtained as per the given table?

कौ श्रेष्ठ री जरी जी न यदरे, स्की जस्ती न जो जरी न दरे, ि 6 सस्ते
ऐ दौ जिदयी, स्की, अस्की, स्की जिखे प्रश्न

SSC CPO 10/11/2022 (Shift-03)

- (a) C (b) D
(c) B (d) A

140. Calculate the mean from the following table

ी यिप्योन री जरी दौ, रं खी जै ि स

Scores	Frequencies
0 - 10	2
0 - 20	4
20 - 30	12
30 - 40	21
40 - 50	6
50 - 60	3
60 - 70	2

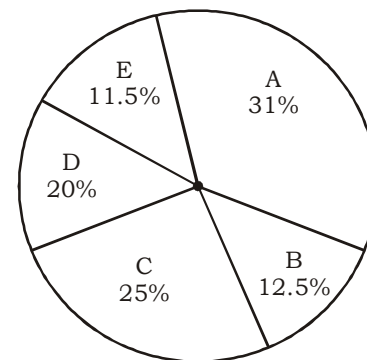
SSC CPO 10/11/2022 (Shift-03)

- (a) 33.4 (b) 32.6
(c) 35.8 (d) 34.2

141. The given pie chart represents the percentage of people in a city who are interested to buy the laptop of five different companies - A, B, C, D and E.

किखी खी, स्कीत रहसजो छपी, ऐ यी 0 र ऐ जी, के छरी जरी कस्तर
प्रो। री, खी न 0 उन 0 ि जूयिखे A, B, C, D नरपी E जी 0 पहरू
रै क्यी, ऐ भतिरे ?रौ प्रश्न

Total People = 5200



The number of people interested to buy company A's laptop is what percentage to the number of people interested to buy company D's laptop?

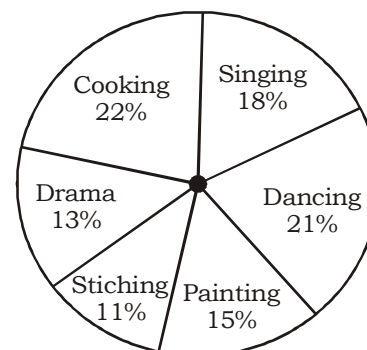
जटू यै A जरी 0 पहरू रै क्यी जी खी की 0 र ऐ जी दैखी जटू यै
D जरी 0 पहरू रै क्यी जी खी की 0 र ऐ जी दैखी जरी जि यर
के छरी प्रश्न

SSC CPO 11/11/2022 (Shift-01)

- (a) 135 (b) 125
(c) 150 (d) 155

142. The given pie chart shows the percentage of students who enrolled in different hobby classes in a school. The number of students who enrolled in cooking classes is what percentage of those enrolled in dancing classes? (Rounded off 2 digits after decimal)

किखी खी, स्कीत रहसजो, जस्ती, ऐ गिस्ती प्रस्की 0 र दरे, ऐ यर र्जिन
ि 3 र जस्ती जरी, के छरी कस्तर प्रो, स्की ज 0 रै जै जदरी, ऐ यर र्जिन
6 सस्ते जै दैखी यखे ज 0 रै जै जदरी, ऐ यर र्जिन 6 सस्ते जै
दैखी जरी जि यी, के छरी प्रो एकी कर 0, अस्की न जी, बस्किन
रिी कै स

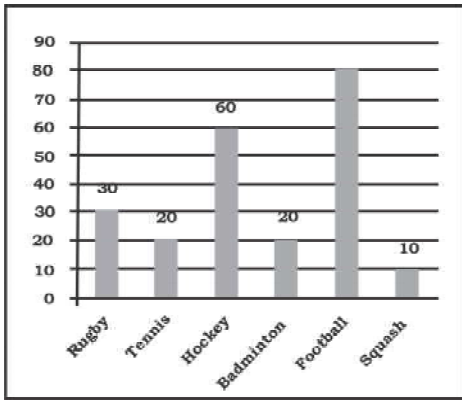


SSC CPO 11/11/2022 (Shift-01)

- (a) 92.65% (b) 125.25%
(c) 105.56% (d) 104.76%

143. The following bar chart shows the number of students playing various games on a given day. Study the bar chart carefully and answer the question that follows.

यिप्यो क्षरी त रहसजो किरी, ऐ गिस्ती ?रौ ?रौ यी 0 र 6 सस्ते जै
दैखी जरी कस्तर प्रो क्षरी त रहसजरी खयू बज्जी न खखी ज ऐ नरप
यै ती किस्ी सी, बयी जरी रिी क



The average of the number of students playing rugby, hockey, badminton and squash is what percentage of the average number of students playing tennis and football?

फहैी प्रखौी क्षषि ह्यी नखी, जू खरी ?यू यी ू री 6 सखी जैी न खन द2खी हयिदी नखी, म्क्षखी ?यू यी ू री 6 सखी जैी न खनी द2ख जरी जि यरी, कि ढरी प्रष

SSC CPO 11/11/2022 (Shift-01)

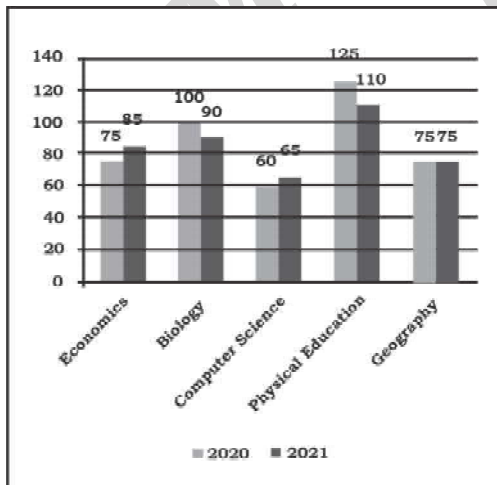
- (a) 60% (b) 30%
(c) 50% (d) 45%

Direction (144-145): Study the given bar-graph and answer the questions based on it.

किसी सी क्षउ 3 मे जरी न खखी जैी सी नखी, दी, नी नखनी, यरी ज री कैि सद

The following bar diagram shows the number of students who opted for the different subjects in the year 2020 and 2021

यिप्यी कही नररी, ईममले नखी मलमी, ऐू गिस्यी ऐू इखी जरी तय्यी ू री 6 सखी जैी द2खी जरी कखरी प्रष



144. Find the ratio of students opting Economics to the students opting Physical Education in 2020.

मलमले, ऐन अखस, यी जरी तखी ज यू ू री 6 सखी जरी ढरैी जी ढिखर जरी तखी ज यू ू री 6 सखी दी न यूरुी थरी जैी सद

SSC CPO 11/11/2022 (Shift-01)

- (a) 3 : 7 (b) 3 : 5
(c) 5 : 9 (d) 5 : 7

145. What is the sum of the total number of students who opted for different subjects in 2020 and only Geography in 2021?

मलमले, ऐू गिस्यी ऐू इखी नखी मलमी, ऐू जू 0ी गखरी जरी तय्यी ू री 6 सखी जैी जखी द2खी जरी खी जि यरी प्रष

SSC CPO 11/11/2022 (Shift-01)

- (a) 345 (b) 510
(c) 150 (d) 435

146. Study the given table and answer the question follows:

कौी श्क्षर री जरी जरी न खखी जैी सी नखी, दजी क्षकी, खी, यय जरी री कैि सद

The distance travelled by two online delivery employees during a week.

सजी दरु खी जी कखस्यी क्री नखी री 0ी, ऐी जू, ढरैी 7ररी नख जैी श्क्षत्रैद

Day	Distance travailed (in km.)	
	First	Second
Monday	200	250
Tuesday	300	400
Wednesday	200	350
Thursday	150	250
Friday	250	350
Saturday	350	100

Find the ratio of the total distance covered by the first employee during first three days and the last three days by the second employee.

ू प्री जू ढरैी 7ररी, प्री नैी यी कियरी जी कखस्यी नखी कही जू, ढरैी 7रर न ऐी नैी यी कियरी ऐू खी जैी श्क्षजकी ढरैी जरी न यूरुी थरी जैी सद

SSC CPO 11/11/2022 (Shift-01)

- (a) 2 : 1 (b) 1 : 1
(c) 1 : 2 (d) 3 : 1

147. The following table shows the data of different colleges whose students participated in the olympiad.

यिप्यी न री जरी ऐू गिस्यी जखी ऐू दी न री ऐू खी, ऐू गरी 0 यी ू री 6 सखी जी नखरी जरी कखस्यी प्रष

Subjects	College A	College B	College C	College D	College E
Hindi	110	100	125	103	112
English	98	120	80	122	105
Maths	130	110	250	160	180
Science	100	100	150	200	80
GK	182	200	120	130	183

What is the percentage increase the number of students who participated in the GK Olympiad to those who participated in the Science Olympiad from all colleges? (Correct to two decimals places)

दरैी जखी ऐू दी दरु खी थयी जी न री ऐू खी, ऐू गरी 0 यी ू री 6 सखी जैी द2खी ऐू थयी जी न री ऐू खी, ऐू गरी 0 यी ू री 6 सखी जैी द2खी दा जि यी, ढरैी न डिजी प्रष एकी कर 0ी, अखरी जी, ढरैी री क

SSC CPO 11/11/2022 (Shift-01)

- (a) 29.37% (b) 29.89%
(c) 29.74% (d) 29.01%

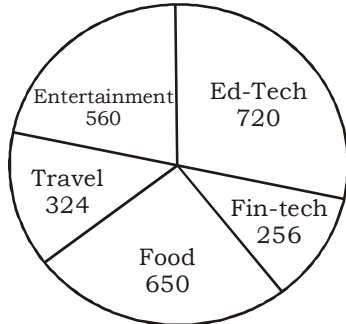
Direction (148-149): Study the given pie-charts and answer the questions based on it.

किसी सी. ए. सेक्टर में शुरू होने वाले नए व्यवसायों की संख्या और सफल व्यवसायों की संख्या के बारे में निम्नलिखित जानकारी दी गई है।

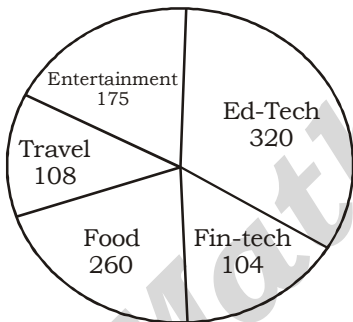
The following pie-charts show the number of start-ups started in various sectors since 2016 and the number of successful start-ups in those sectors respectively.

निम्नलिखित दो पाई चार्ट दिखाते हैं कि 2016 से विभिन्न क्षेत्रों में शुरू होने वाले व्यवसायों की संख्या और सफल व्यवसायों की संख्या का वितरण।

Number of start-ups (since 2016)



Number of successful start-ups



148. Find the ratio of the number of successful start-ups in entertainment sector to the total number of start-ups in entertainment since 2016.

मला चे दो. ए. सेक्टर में सफल व्यवसायों की संख्या और 2016 से ए. सेक्टर में शुरू होने वाले व्यवसायों की कुल संख्या का अनुपात ज्ञात करें।

SSC CPO 11/11/2022 (Shift-02)

- (a) 5 : 16 (b) 5 : 17
(c) 7 : 16 (d) 25 : 81

149. What is the ratio of the number of successful start-ups to that of unsuccessful start-ups in Fin-tech sector?

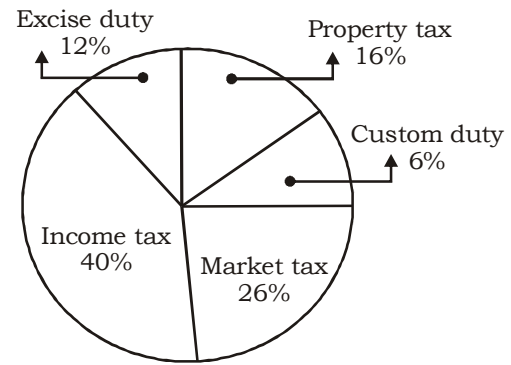
फिनटेक सेक्टर में सफल व्यवसायों की संख्या और असफल व्यवसायों की संख्या का अनुपात ज्ञात करें।

SSC CPO 11/11/2022 (Shift-03)

- (a) 3 : 4 (b) 13 : 18
(c) 23 : 32 (d) 13 : 19

150. The following pie chart shows the distribution of income from different taxes. Study the chart and answer the question.

निम्नलिखित पाई चार्ट विभिन्न करों से आय का वितरण दिखाता है। चार्ट को ध्यान से पढ़ें और प्रश्न का उत्तर दें।



If the income from the market tax in a year is ₹ 260 crore, then the total income from other sources is: (in ₹ Crore)

यदि एक वर्ष में बाजार कर से आय ₹ 260 करोड़ है, तो अन्य स्रोतों से कुल आय कितनी होगी? (₹ करोड़ में)

SSC CPO 11/11/2022 (Shift-02)

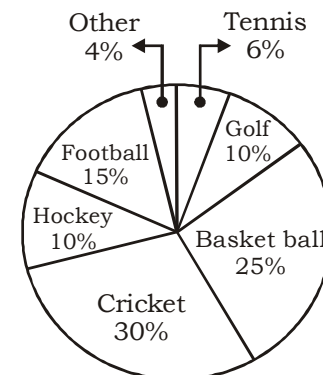
- (a) 540 (b) 560
(c) 740 (d) 760

151. The circle graph given here shows the spending of a country on various sports during a year. Study the graph carefully to answer the question.

यहाँ दिया गया पाई चार्ट एक देश में विभिन्न खेलों पर खर्च की गई राशि का वितरण दर्शाता है। चार्ट को ध्यान से पढ़ें और प्रश्न का उत्तर दें।

Percentage of money spent on various sports for one year.

एक वर्ष में विभिन्न खेलों पर खर्च की गई राशि का प्रतिशत।



If the total amount spent during the year was ₹ 12000000 then how much was spent on Basket Ball?

यदि एक वर्ष में कुल खर्च ₹ 12000000 था, तो बास्केटबॉल पर कितना खर्च हुआ?

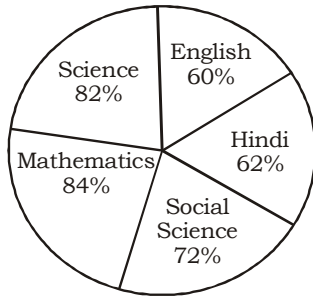
SSC CPO 11/11/2022 (Shift-02)

- (a) 2500000 (b) 1000000
(c) 4000000 (d) 3000000

152. The given chart shows the marks scored by a class X student in different subjects.

यहाँ दिया गया चार्ट एक कक्षा X के छात्र द्वारा विभिन्न विषयों में प्राप्त अंकों का वितरण दर्शाता है।

**Class x marks of a Student
(Values are in Degrees)**

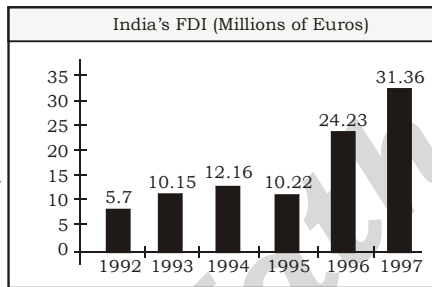


If the total marks are 1800, then find the difference between the marks scored in science and mathematics.
 खकी जछी न छी 15 लक्ष प्रेनरी रू थस्यो नरपी िरुी, ऐ कुरी न छरि जा क्षे ती जरी नरुी थरुी जै ि सद

SSC CPO 11/11/2022 (Shift-02)

- (a) 2 (b) 10
(c) 1 (d) 5

153. The following bar chart shows the vends of foreign direct investment (FDI) into India all over the world.
 यिप्यो िरुी क्षरुी त रहस्यखी गरी ढी गल्लनी, ऐ कछुी रू करी यूर ष (FDI) जी रू ठ खे जरी कसुरी प्रष



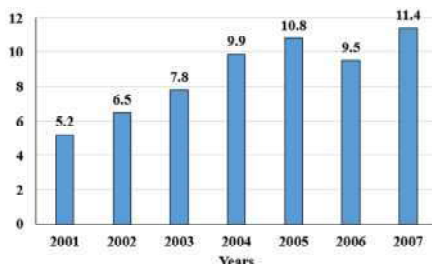
For which year is the percent increase in FDI over the previous year the highest?
 जिढी ईस 60 रू ईस जीन छरुी, ऐ FDI, ऐ कछुी रू थरुी ढक्षढा न डिजी प्रष

SSC CPO 11/11/2022 (Shift-02)

- (a) 1997 (b) 1994
(c) 1996 (d) 1993

154. The following bar graph describes the population of a town (in Lakhs) from 2001 to 2007

यिप्यो िरुी कछी नर ढरी मल्लनी ढी मल्लनी न जी सजी ज, क्षे जी रू। यढेख ए० ररुी, छी जरी कसुरी प्रष



Find the percentage increase in population from 2006 to 2007.
 मल्लनी ढी मल्लनी न जी। यढेखी, ऐ कछुी रू थरुी जै ि सद

SSC CPO 11/11/2022 (Shift-02)

- (a) 15% (b) 20%
(c) 16% (d) 18%

155. The following table shows the production of different types of two wheelers from 1993 to 1998. (No. of two wheelers is in 1000s)

यिप्यो नरुी जरी 188 ले ढी 188 री न जी रू गिल्लनी, कुरी जी कुरी प्रिख रू थरुी जी रू थरुी जरी कसुरी प्रष एका प्रिखी रू थरुी जी ढेख 1 लल्लनी, ऐ प्रष

Year Type	1993	1994	1995	1996	1997	1998
A	36	34	40	35	37.5	40
B	20	22	25	23	19.5	18
C	14	22	16	25	29	35
D	60	62	67.5	75	76	80
E	40	45	48	50	80	105
F	45	52	55	60	57.5	56
Total	215	237	251.5	268	299.5	334

What is the approximate percentage increase in the total production of all types of two wheelers in 1998 in comparison to 1994?

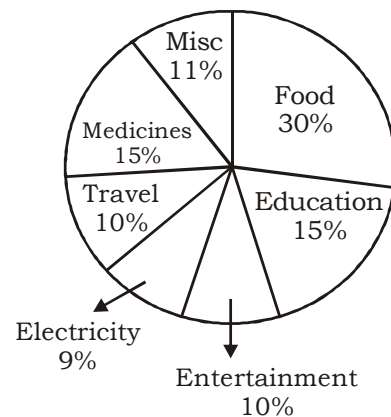
188 री जी न छरुी, ऐ 188 री, ऐ ढरुी, कुरी जी कुरी प्रिखी रू थरुी जरी जछी रू थरुी, ऐ 0 गरी कछुी रू थरुी जि यी प्रष

SSC CPO 11/11/2022 (Shift-02)

- (a) 42 (b) 45
(c) 40 (d) 41

156. The following pie chart shows the monthly household expenditure of Family A under various heads. The monthly expenditure incurred for Family A is Rs 50,000. Study the chart carefully and answer the question that follows.

यिप्यो रू थरुी रहस्य गिल्लनी, कुरी जी न कुरी रू री A जी, रढिजी 50 ब . खी जरी कसुरी प्रष रू री A जरी, रढिजी . खी रू 50,000 प्रष त रहस्य जरी खरुी बल्ली न खखी ज ऐ नरुपी यै ती किसी सी कुरी जर ि री कछ



What is the ratio of the combined monthly expenditure on Entertainment, Travel and Miscellaneous to the average expenditure on Food, Education, Electricity and Medicine?

युरा यी खसुरी रू रू रू ढी, ढेखकी, रढिजी . खी नरुपी गल्ल यी थिखे क्षि। ढी नरुपी तिजिज्दरे, ढी न सल्लनी . खी जरी न युरुी जि यरी प्रष

SSC CPO 11/11/2022 (Shift-03)

- (a) 69 : 125 (b) 69 : 124
(c) 124 : 69 (d) 31 : 69

157. Number of units manufactured (M) and number of units sold (S) (in hundred by a company over the years.
- गिस्वो, इरु, ए सजो जूयै 7र रे विरि नो जलखो जै दखो (M) नखो ट खे जै जलखो जै दखो (S) एदखारे, हो प्र

Year	M	S
2011	2.6	1.7
2012	2.2	1.5
2013	2.1	1.0
2014	2.8	1.4
2015	2.6	2.1

What is the average number of units sold by the company per year?

दो जूयै 7र रे ट खे जै जलखो जै नखो दखो, ई इज जि यै प्र

SSC CPO 11/11/2022 (Shift-03)

- (a) 140 (b) 150
(c) 154 (d) 156
158. The following table gives quantity of various items used by a restaurant during four months of the year (in kg)

विप्यो न री जरी सजो इरुजो तरि, प्रै यो जी कपयो सजो, इरु, ए खो प्रयो री गिस्वो ?सो, कखो जै, सरी एजि, ए जरी विद्यु)रे ज नै प्र

Food Item	March	April	May	June
A	220	180	270	320
B	255	320	390	420
C	280	295	280	315
D	350	310	250	280
E	308	340	350	365

The quantity of E used in the month of March is what percentage of the total quantity of food items used in the May?

सजो, प्रै यो, ए खो E जै, सरी, इरुजो, प्रै यो, ए खो दगै ?सो, कखो जै जो, सरी जै जि यो, ई री प्र

SSC CPO 11/11/2022 (Shift-03)

- (a) 20% (b) 14%
(c) 12.3% (d) 17.8%
159. The following table shows the different types of cars sold by a company over the given years (numbers in thousands).

विप्यो न री जरी सजो जूयै 7र रे विरि सी इरु, ए डिटै जै जलखो, कखी जै जर रे जै दखो कखो प्रै एदखो प्रार रे, ए

Year	Types				
	A	B	C	D	E
2007	15	12	10	8	9
2008	10	10	13	12	12
2009	25	10	12	19	18
2010	12	18	13	12	12
2011	19	12	12	14	14
2012	15	14	14	14	15

The percentage of type E cars sold out of the total number of cars sold was minimum in which year?

डिटै जै जलखो जै जलखो, एदो E, कखी जै जर रे जै डिटै जरी, ई री जिदो, इरुजो, ए अरु

SSC CPO 11/11/2022 (Shift-03)

- (a) 2011 (b) 2007
(c) 2010 (d) 2008
160. The following table shows the number of delivery partners (in thousands) who joined five different companies during six different years.

विप्यो न री जरी ची न 0 उन 0 री इरु, जो कपयो, खी न 0 उन 0 जूयिखो, ए री 0 प्रयो री गरै क रे एप्रार रे, हो जै दख कखो प्र

Year	Companies				
	Emozon	Clipkart	Twiggy	Tomato	Pyntra
2016	2.4	4.5	1.2	0.9	4.2
2017	1.8	5.4	1.5	1.2	5.6
2018	3.2	7.2	2.4	2.1	6.3
2019	3.9	5.6	2.8	2.7	6.5
2020	4.2	6.4	3.2	3.3	7.0
2021	5.0	7.2	3.6	3.6	7.2

Find the average number of delivery partners who joined Twiggy in the last 6 years.

601 ची इरु, ए डिटै, ए री 0 प्रयो री री 0 गरै क रे जै नखो दखो री जै स

SSC CPO 11/11/2022 (Shift-03)

- (a) 2545 (b) 2450
(c) 2540 (d) 2455
161. The numbers of students who passed with different honours from a college during 2015 to 2018 are depicted in the given table. Study the table and answer the following question.

कै इरु री जरी, एमल 0 दो मला 0 जी कपयो सजो जलखो दो गिस्वो इरु, ए री 6 सरी जै दखो कखो इरुजो न री जरी न खखी जै सि नखो विप्यो री, यो जरी री कै स

Year	Maths	Phy.	Chem.	Zoo.	Bot.
2015	10	5	8	7	5
2016	4	8	3	4	1
2017	15	10	8	5	3
2018	9	3	1	2	1

How many students passed with mathematics, Physics, Chemistry, Zoology and Botany from the year 2015 to 2018?

इमल 0 दो मला 0 जी जि यो 6 सरी री गरै जै दखो री थये री री थयो, ए री री थयो, ए री री थयो

SSC CPO 11/11/2022 (Shift-03)

- (a) 112 (b) 97
(c) 100 (d) 99

ANSWER KEY

1.(d)	2.(d)	3.(c)	4.(d)	5.(d)	6.(b)	7.(b)	8.(b)	9.(b)	10.(a)
11.(d)	12.(b)	13.(b)	14.(b)	15.(a)	16.(a)	17.(a)	18.(c)	19.(b)	20.(c)
21.(a)	22.(c)	23.(c)	24.(d)	25.(a)	26.(c)	27.(a)	28.(d)	29.(c)	30.(b)
31.(c)	32.(c)	33.(c)	34.(b)	35.(c)	36.(c)	37.(b)	38.(a)	39.(a)	40.(a)
41.(d)	42.(c)	43.(d)	44.(b)	45.(d)	46.(a)	47.(d)	48.(b)	49.(a)	50.(c)
51.(b)	52.(b)	53.(d)	54.(b)	55.(d)	56.(b)	57.(b)	58.(c)	59.(d)	60.(b)
61.(b)	62.(b)	63.(a)	64.(a)	65.(a)	66.(d)	67.(c)	68.(d)	69.(d)	70.(a)
71.(d)	72.(c)	73.(d)	74.(d)	75.(b)	76.(a)	77.(d)	78.(a)	79.(d)	80.(b)
81.(d)	82.(d)	83.(d)	84.(b)	85.(c)	86.(b)	87.(c)	88.(a)	89.(b)	90.(c)
91.(b)	92.(b)	93.(a)	94.(d)	95.(c)	96.(d)	97.(c)	98.(c)	99.(b)	100.(b)
101.(a)	102.(b)	103.(c)	104.(b)	105.(c)	106.(d)	107.(a)	108.(c)	109.(b)	110.(c)
111.(d)	112.(c)	113.(b)	114.(c)	115.(b)	116.(a)	117.(b)	118.(c)	119.(a)	120.(c)
121.(b)	122.(c)	123.(b)	124.(b)	125.(c)	126.(d)	127.(c)	128.(c)	129.(d)	130.(b)
131.(c)	132.(c)	133.(a)	134.(a)	135.(a)	136.(b)	137.(c)	138.(a)	139.(b)	140.(a)
141.(d)	142.(d)	143.(a)	144.(b)	145.(b)	146.(b)	147.(a)	148.(a)	149.(d)	150.(c)
151.(d)	152.(b)	153.(c)	154.(b)	155.(d)	156.(c)	157.(c)	158.(a)	159.(b)	160.(b)
161.(a)									

SOLUTIONS

1. (d) Required number of students

$$= \left[\left(\frac{80}{100} \times 120 \right) + \left(\frac{78}{100} \times 135 \right) \right] \times 1000$$

$$\Rightarrow (96 + 105.3) \times 1000$$

$$\Rightarrow 201300$$

2. (d) Failed candidates in city D = $\frac{6}{10} \times 2.35 = 1.41$ lakhs

3. (c) Children in P and Q together:-

$$= \frac{20}{100} \times 10,000 + \frac{30}{100} \times 20,000$$

$$= 2000 + 6000 = 8000$$

4. (d) Total students in 2010 = 200
Students with 2nd division = 60

$$\therefore \text{Required}\% = \frac{60}{200} \times 100 = 30\%$$

5. (d) Total Expenditure =

$$5425 + 5250 + 6125 + 7525 + 6475 + 4200$$

$$= 35000$$

$$\text{Expenditure on education} = 5425$$

$$\text{Required angle} = \frac{360^\circ}{35000} \times 5425$$

$$\frac{90 \times 4 \times 25 \times 217}{35000} = \frac{9 \times 217}{35}$$

$$= \frac{9 \times 31 \times 2}{5 \times 2}$$

$$= \frac{558}{10} = 55.8^\circ$$

6. (b) Maths $\rightarrow 100\% \rightarrow 360^\circ$

$$20\% \rightarrow \frac{360}{100} \times 20\%$$

$$\text{Science} \rightarrow 100 \rightarrow 360^\circ$$

$$30\% \rightarrow \frac{360}{100} \times 30\%$$

$$\text{Now, required ratio} = \frac{360}{100} \times 20\% : \frac{360}{100} \times 30\%$$

$$= \frac{20}{30} = 2 : 3$$

7. (b) In 2003 = $\frac{6.5 - 5.2}{5.2} \times 100 = 25\%$

$$\text{In 2004} = \frac{7.8 - 6.5}{6.5} \times 100 = 20\%$$

$$\text{In 2005} = \frac{9.9 - 7.8}{9.8} \times 100 \approx 27\%$$

$$\text{In 2006} = \frac{10.8 - 9.9}{9.9} \times 100 = 9.09\%$$

$$\text{In 2008} = \frac{11.4 - 9.5}{9.5} \times 100 = 20\%$$

$\therefore$ Max increase in 2005

$$8. \quad \frac{\text{A during March}}{\text{A during April}} = \frac{\frac{3}{5} \times 20}{\frac{8}{15} \times 25}$$

$$= \frac{12 \times 3}{40} = \frac{9}{10} \Rightarrow 9 : 10$$

$$9. \quad \text{(b) Required}\% = \frac{8200 - 8000}{8000} \times 100$$

$$= \frac{20000}{8000} = \frac{20}{8} = \frac{5}{2} = 2.5\%$$

10. (a) Products sold by A on Thursday = 3000 - (2300) = 700

$$\text{Products sold by B on Tuesday} = 3500 - (3000) = 500$$

$$\text{Required sale} = 700 - 500 = 200 \text{ less}$$

11. (d) ATQ,

$$6 + 62 = 68\% \rightarrow 850$$

$$\text{total expenditure} = 100\% \rightarrow \frac{850}{68} \times 100 = 1250$$

12. (b) Required% = $\frac{15}{18} \times 100 = \frac{5}{6} \times 100 \approx 83\%$

13. (b) Required% = $\frac{1342}{1666} \times 100$

$$= \frac{671}{833} \times 100 = 80.55\%$$

14. (b) Required average = $\frac{85 + 80 + 75 + 70}{4} = \frac{310}{4} = 77.5$

$$\text{Now, required percentage} = \frac{77.5}{100} \times 100 = 77.5\%$$

15. (a) Required percentage = $\frac{45 + 65}{360} \times 100$

$$= \frac{1100}{36} = \frac{275}{9} = 30\frac{5}{9}\%$$

16. (a) Clearly from given table, Car S Shows continuous increase
17. (a) Clearly from given table, Car R shows continuous decrease.
18. (c) Total cakes by Q and S in september = $189 + 154 = 343$
Total cakes by P and R in November = $168 + 168 = 336$
 $\therefore$ difference = $343 - 336 = 7$
19. (b) From given table average percentage of passing students is least in college A.
 $= 68 + 72 + 78 + 80 = 298$
20. (c) In 2015, highest earning is of R, ie, 68.
21. (a) Clearly, from given table wheat has continuous increase.
22. (c) 12% of total expenditure spent on education
Now, the required sum = $\frac{12}{100} \times 100000 = 12000$
23. (c) Required percentage = $100 \times \frac{\text{boys in B}}{\text{girl in E}} = \frac{30}{55} \times 100$
 $= 54.54 \approx 55\%$
24. (d) Required ratio = $\frac{206 + 326}{350 + 420} = \frac{532}{770} = \frac{76}{110} = \frac{38}{55}$
25. (a) UK : Australia = $125^\circ - 75^\circ = 50^\circ$
 $\Rightarrow \frac{50^\circ}{360^\circ} \times 14400 = 2000$
26. (c) According to given graph minimum employees in C organisation.
27. (a) Students in Y and Z = 55%
Student in X and Y = 75%
 $\therefore$ Difference = $75 - 55 = 20\%$
 $\frac{3600}{100} \times 20 = 720$
28. (d) Addicated males in Channai:-
 $= \frac{11}{20} \times 2,00,000 = 110000$
29. (c) Male in P = $4560 - 2210 = 2350$
Male in R = $3052 - 1280 = 1772$
 $\therefore$ Required difference = $2350 - 1772 = 578$
30. (b) $\frac{\text{books in C1}}{\text{avg. books}} = \frac{\frac{10}{100} \times 60}{\frac{60}{4}} = \frac{4}{10} = \frac{2}{5}$
31. (c) From given table:-
Bicycle has maximum students = $280 + 190 = 470$
32. (c) Required% = $\frac{846}{1880} \times 100$
 $= \frac{4230}{94} = \frac{2115}{47} = 45\%$
33. (c) The highest total sale is battery 32 AH
 $114 + 102 + 75 + 150 + 135 + 165 + 160 = 901$
34. (b) Clearly from table maximum number of students are in Class VI = $160 + 166 + 152 + 142 + 144 + 160 = 924$
35. (c) Runs in New Zealand and Pakistan = $14\% + 16\%$
 $= 30\% = \frac{30}{100} \times 4000 = 1200$
Runs against Srilanka and Pakistan = $20\% + 15\% = 35\%$
 $= \frac{35}{100} \times 5000 = 1750$
 $\therefore$ Difference = $1750 - 1200 = 550$
36. (c) Bananas sold = $\frac{30}{100} \times 1200 = 360$
37. (b) Avg. of A and C = $\left(\frac{55 + 13}{2}\right) \times \frac{2000}{100} \Rightarrow \frac{68000}{100} = 680$
38. (a)

	P	Q
2002 $\rightarrow$	120	130 (more)
2005 $\rightarrow$	205	240 (more)

From table, it is clear that company Q produce more than company P in 2002 and 2005.
39. (a) Required difference = $S - Q = 205 - 198 = 7$
40. (a) Total = 24h
Sleep = 8 hour
Required percentage = $\frac{8}{24} \times 100 = 33.33\%$
41. (d) Required number of students are:-
 $\frac{(73 - 27)}{100} \times 350$
 $= \frac{46}{100} \times 350 = 23 \times 7 = 161$
42. (c) Total people = $28 + 32 + 46 = 106$
Required% = $\frac{9 + 7 + 13}{106} \times 100$
 $= \frac{29}{106} \times 100 = 27.36\%$
43. (d) Required number of students = $\frac{22 + 10 + 8}{100} \times 6700 = 2680$
44. (b) Required females = $\frac{3}{8} \times \frac{80}{100} \times 8000 = 2400$
45. (d) Required ratio = $\frac{5000}{9000} = \frac{5}{9}$
46. (a) Required% = $\frac{50 + 12}{20 + 10} = \frac{62}{30} \times 100$
 $= \frac{620}{3} = 206.66\%$

47. (d)

$$\begin{aligned} \text{Average production of milk} &= \frac{40 + 50 + 30 + 20 + 25 + 30 + 40 + 30 + 20 + 20 + 30 + 25}{4} \\ &= \frac{360}{4} = 90 \end{aligned}$$

48. (b) Required average = $\frac{800 + 600 + 900 + 1100 + 1200}{5}$

$$= \frac{4600}{5} = 920$$

49. (a) Required% = $\frac{(830 + 501 + 1330) - (650 + 450 + 1008)}{650 + 450 + 1008} \times 100$

$$= \frac{2661 - 2108}{2108} \times 100$$

$$= \frac{55300}{2108} = 26.23\%$$

50. (c) Required female:-

$$= \frac{3}{6} \times \frac{76}{100} \times 26000 = 9880$$

51. (b) Clearly, from graph legal department has least number of employees in each organisation.

52. (b) Required difference = $(280 + 365) - (350 + 260)$

$$= 645 - 610 = 35$$

53. (d) Total expenditure = $8000 + 2000 + 6000 + 4000 = 20000$

Clothing = 2000

$$\text{Required\%} = \frac{2000}{20,000} \times 100 = 10\%$$

54. (b) Difference = $30\% - 15\% = 15\%$

$$\text{Required amount} = \frac{15}{100} \times 300000 = \text{Rs.}45000$$

55. (d) Required% = $\frac{30}{33 + 30 + 36 + 21} \times 100$

$$= \frac{30}{120} \times 100 = 25\%$$

56. (b) Required difference = $115 - 60 = 55$ lakh

57. (b) Required number = $\frac{3}{4} \times 4000 - \frac{1}{3} \times 6000$

$$= 3000 - 2000 = 1000$$

58. (c) Required amount = $\frac{20 + 13}{100} \times 7500000$

$$= 33 \times 75000 = 24,75,000$$

59. (d) Required% = $\frac{380 - 150}{380} \times 100$

$$= \frac{230}{380} \times 100 = \frac{1150}{19} = 60 \frac{10}{19}\%$$

60. (b) Clearly, from the graph class IX has minimum no. of students.

61. (b) Required difference:-

$$\frac{320 + 240}{2} - \frac{320 + 200}{2} = 280 - 260 = 20$$

62. (b) Required angle = $\frac{30}{100} \times 360^\circ = 108^\circ$

63. (a) Total respondents = 200

Those who own a car = $25 + 15 + 10 + 5 = 55$

Those who not own a car = $200 - 55 = 145$

$$\Rightarrow \text{Required\%} = \frac{145}{200} \times 100 = 72.5\%$$

64. (a) Required ratio:-

$$= \frac{7000 + 6600}{8000 + 7600} = \frac{13600}{15600} = \frac{34}{39}$$

65. (a) Required difference:-

$$(15 - 10)\% = 5\% \text{ of } 1200 \text{ kg} = \frac{1}{20} \times 1200 = 60 \text{ kg}$$

66. (d) Required marks = $88 + 80 + 90 + 82 + 85 = 425$

67. (c) Required% = $\frac{162 \times 100}{933} = 17.36\%$

68. (d) Required percentage = $\frac{20}{45} \times 100 = 44.44\%$

69. (d) From table it is clear that, lowest sale combination is:- B, 2010

70. (a) From the table it is clear that A has maximum employees.

71. (d) Required% = $\frac{(20 - 10)}{10} = \frac{10}{10} \times 100 = 100\%$

72. (c) Required difference = $(45 - 40) \times 100 = 500$

73. (d) Required difference = $(15 - 5)\% = 10\% \text{ of } 100000$

$$= 10,000$$

74. (d) Overall avg. increment of Kamal:-

$$\frac{65 + 55 + 75}{3} = \frac{195}{3} = \text{Rs.}65$$

75. (b) Required ratio = $\frac{212 + 168}{255 + 245} = \frac{380}{500} \Rightarrow 19 : 25$

76. (a) 2017 → expenditure → 80

2018 → expenditure → 100

$$\text{Required\%} = \frac{100 - 80}{80} \times 100 = 25\%$$

77. (d) Required ratio = $\frac{69 + 63}{74 + 90} = \frac{132}{164} = \frac{33}{41}$

78. (a) Clearly, from table required city is:- 'B'

79. (d) Required average:-

$$\begin{aligned} &(4 \times 0) + (22 \times 1) + (15 \times 2) \\ &+ (6 \times 3) + (4 \times 2) = \frac{22 + 30 + 18 + 8}{49} = \frac{78}{49} \end{aligned}$$

$$= 1.59$$

80. (b) Required amount = $\frac{79.2^\circ}{360^\circ} \times 56800 = 12496$
81. (d) Required difference = Production of company & in 2018
– Production of company C in 2015
= 55,00,000 – 45,00,000 = 10,00,000 tonnes
82. (d) Average production of company X
= $\frac{30 + 45 + 25 + 50 + 40}{5} = 38$
Average production of company Y
= $\frac{25 + 35 + 35 + 40 + 50}{5} = 37$
Average production of company Z
= $\frac{35 + 40 + 45 + 35 + 35}{5} = 38$
Hence, Required Answer = X and Z
83. (d) From 2016 to 2017,
Required percentage increment
= $\frac{10}{25} \times 100\% = 40\%$
Rise in the productin of cars for company Y from 2016 to 2017 is 40 percent which is highest.
84. (b) Total production of model A mobiles in 2020 and model E mobiles in 2019
= 40% of 6500000 + 15% of 4000000
= 2600000 + 600000 = 3200000
85. (c) No. of trees are axed in 2016
= 18 + 25 + 18 + 20 = 81
No. of trees are axed in 2017
= 25 + 23 + 18.5 + 18 = 84.5
No. of trees are axed in 2018
= 23 + 24 + 18.4 + 17.6 = 83
No. of trees are axed in 2019
= 24.4 + 19.5 + 19 + 16 = 78.9
No. of trees are axed in 2020
= 22.5 + 21 + 20 + 17.5 = 81
Hence, The least number of trees are axed in 2019
86. (b) The student who got the highest marks in subject P1 = Vishal(82)
The student who got the highest marks in subject P2 = Viraj(89)
The student who got the highest marks in subject P3 = Viraj(86)
Hence, Required Answer = (b) Vishal, Viraj, Viraj
87. (c) Average Percentage marks obtained by all the students in Geography
= $\frac{88 + 92 + 64 + 80 + 88 + 72}{6} = \frac{484}{6} = 80.66\%$
Average Marks = 80.66% of 75 = 60.495 = 60.5

88. (a) Total Marks of student Q in Physics and Hindi
= 90% of 80 + 54% of 100
= 72 + 54 = 126
Total Marks of student T in Geography and History
= 88% of 75 + 42% of 50
= 66 + 21 = 87
Required percentage = $\frac{39}{87} \times 100\%$
= 44.82% = 45% (Approx)
89. (b) Total Maximum Marks
= 80 + 150 + 100 + 75 + 120 + 50 = 575
Marks obtained by student T
= 65% of 80 + 60% of 150 + 45% of 100 + 88% of 75 + 50% of 120 + 42% of 50
= 52 + 90 + 45 + 66 + 60 + 21 = 334
Required percentage
= $\frac{334}{575} \times 100\% = 58\%$
90. (c) Maximum marks
= 300 + 300 + 200 + 100 + 100 = 1000
Marks scored by X = (70% of 300) + (90% of 300) + (95% of 200) + (80% of 100) + (75% of 100)
= 210 + 270 + 190 + 80 + 75 = 825
Percentage marks obtained by X
= $\frac{825}{1000} \times 100\% = 82.5\%$
91. (b) Total number of students in Activity II
= 50 + 150 + 150 + 50 + 50 + 50 + 50 = 550
Total number of students in Activity IV
= 250 + 125 + 350 + 275 + 250 + 150 + 150 = 1550
Required percent = $\frac{550}{1550} \times 100\% = 35.48\%$
92. (b) Marks of students after deduction of 5 marks,
50, 85, 70, 75, 85
Mean = $\frac{50 + 85 + 70 + 75 + 85}{5} = 73$
Mode = 85
Median = 75
Net Average
= $\frac{\text{Mean} + \text{Mode} + \text{Median}}{3} = \frac{73 + 85 + 75}{3} = \frac{233}{3} = 77.67$
93. (a) Total contribution in corpus fund,
= 74.30 + 75.00 + 77.50 + 69.05 + 70.00 + 67.52
= 433.37
Contribution of Rakesh in Corpus fund = 75.00
Percentage contribution of Rakesh
= $\frac{75}{433.37} \times 100 = 17.30\%$

94. (d) Total population of village = 60000
In percentage, population of village D = 17%
In percentage, population of village E = 18%
Difference between population of village D and E

$$= 1\% \text{ of Total population} = 60000 \times \frac{1}{100} = 600$$

95. (c) Total population = 50000
Population of Village D

$$= 50000 \times \frac{17}{100} = 8500$$

96. (d) Combined highest score in Accounts and Business studies

$$= 96 + 96 = 192$$

$$\text{Combined highest score in Economics and English} = 100 + 100 = 200$$

Hence, Answer (d) Economics and English by 8

97. (c) Average Export of rice

$$= \frac{10.4 + 13 + 15.6 + 21.6 + 18.8}{5} = \frac{79.4}{5} = 15.88$$

98. (c) Average Export of Rice

$$= \frac{10.4 + 13 + 15.6 + 21.6 + 18.8}{5} = \frac{79.4}{5} = 15.88$$

In 2010, 2011 and 2012 there was less export than the average export.

99. (b) Total Production of wheat

$$= 113 + 96 + 42 + 47 + 32 + 25 + 18 + 38 = 411$$

% Production of P's Alone

$$= \frac{113}{411} \times 100 = 27.49\% = 27.50\% \text{ (Approx)}$$

100. (b) Total production of rice in the country-

$$= 55 + 58 + 69 + 51 + 47 + 78 + 67 + 48 = 473$$

Total production of wheat in the country-

$$= 113 + 96 + 42 + 47 + 32 + 25 + 18 + 38 = 411$$

Hence Required ratio = 473 : 411

101. (a) Given,

Total population of State B = 3000

Population below poverty line

$$= 60\% \text{ of } 3000$$

$$= 1800$$

Number of girls below poverty line

$$= 1800 \times \frac{4}{6} = 1200$$

102. (b) Population of village A in 2018 = 12381

Population of village A in 2021 = 13256

$$\text{Increment} = 13256 - 12381 = 875$$

Percentage Increment

$$= \frac{\text{Increment}}{\text{Population in 2018}} \times 100\%$$

$$= \frac{875}{12381} \times 100\% = 7.07\%$$

103. (c) Average Population of village D

$$= \frac{5152 + 5230 + 5346 + 5500}{4} = \frac{21228}{4} = 5307$$

104. (b) Combined production of A and D for the year 2014 to 2016.

$$= 1350 + 570 + 420 + 810 + 990 + 580$$

$$= 4720$$

Combined production of B and C for the year 2014 to 2016,

$$= 750 + 520 + 1170 + 630 + 1280 + 650$$

$$= 5000$$

Required Difference

$$= 5000 - 4720 = 280$$

105. (c) Appeared in 1991 = 8562

Appeared in 1992 = 8139

$$\text{Reduction} = 8562 - 8139 = 423$$

$$\text{Required Drop \%} = \frac{423}{8562} \times 100\%$$

$$= 4.940\%$$

$$= 5\% \text{ (Approx)}$$

106. (d) The number of person who speaks English and Bhojpuri

$$= (15 + 10)\% \text{ of } 120$$

$$= 25\% \text{ of } 120 = 30$$

and, The number of person wh speaks Tamil = 5% of 120 = 6

$$\text{Required Ratio} = 30 : 6$$

$$= 5 : 1$$

107. (a) In 1995

No. of worker in category B is 15% = 1500

Therefore, No. of worker in Category D is 25% = 2500

In 1996

No. of worker is increased by 10% in category B

$$= 110\% \text{ of } 1500 = 1650$$

No. of worker is decreased by 5% in category D

$$= 95\% \text{ of } 2500 = 2375$$

Hence, Required Sum

$$= 1650 + 2375$$

$$= 4025$$

108. (c) The number of employee of company B in 2019 = 18 lakh

The number of employee of company C in 2021 = 17 lakh

Required percentage

$$= \frac{18}{17} \times 100\% = 105.88\%$$

109. (b) The length of mountains in Punjab = 40

The length of rivers in odisha = 10

Difference between the mountains and rivers lengths

$$= 40 - 10 = 30$$

$$\text{Required percentage} = \frac{30}{10} \times 100\% = 300\%$$

110. (c) The average of appeared students

$$= \frac{2500 + 3000 + 4500 + 1200}{4}$$

$$= \frac{11200}{4} = 2800$$

The average of passed students

$$= \frac{1350 + 2500 + 3900 + 850}{4}$$

$$= \frac{8600}{4} = 2150$$

Hence, difference between average

$$= 2800 - 2150 = 650$$

111. (d) Total marks = 300 + 300 + 150 + 300 + 200 = 1250

Marks obtained by Mohan:

In Chemistry – 70% of 300 = 210

In Mathematics – 75% of 300 = 225

In Physics – 80% of 150 = 120

In Hindi – 65% of 300 = 195

In English – 85% of 200 = 170

Total obtained marks = 210 + 225 + 120 + 195 + 170 = 920

Average marks percentage

$$= \frac{\text{Obtained marks}}{\text{Total marks}} \times 100\%$$

$$= \frac{920}{1250} \times 100\% = 73.6\%$$

112. (c) Average consumption of wheat

$$= \frac{162 + 196 + 187 + 189}{4} = 183.5$$

Average consumption of oats

$$= \frac{131 + 116 + 103 + 101}{4} = 112.75$$

$$\text{Difference} = 183.5 - 112.75 = 70.75$$

113. (b) No. of students who opted Biology in School D = 20% of 800 = 160

114. (c) Number of students in school B who opted biology

$$400 \times \frac{36}{100} = 144$$

Number of students in school D who opted biology

$$800 \times \frac{18}{100} = 144$$

Required Ratio = 1 : 1

115. (b) By option–

No. of vehicles sold in the following combinations:

in A, 2011 = 700000

in B, 2014 = 710000

in C, 2014 = 690000

in D, 2012 = 700000

Maximum in combination – B, 2014

Hence, Required answer is (b)

116. (a) Money spent on Food and Rent

$$= (25 + 12)\% \text{ of Total Expenditure}$$

$$= 37\% \text{ of } 65000$$

$$= 24050$$

117. (b) Central angle for Anil's expenses on Power and fuel–

$$= \frac{15}{100} \times 360^\circ$$

$$= 54^\circ$$

118. (c) Check By option:

Number of Books issued in January = 4500

Number of Books issued in April = 4800

Number of Books issued in May = 6800

Number of Books issued in February = 6000

Maximum number of books were issued in May

$$119. (a) J = \frac{1500 + 1460 + 1105}{3} = \frac{4065}{3} = 1355$$

$$K = \frac{1320 + 1180 + 1170}{3} = \frac{3670}{3}$$

Average of J and K

$$= \frac{1355 + 1223.33}{2} = \frac{2578.33}{2} = 1289.165 = 1289.17$$

120. (c) Total number of male in all village

$$= 1500 + 1460 + 1105 + 1305$$

$$= 5370$$

Total number of female in all village

$$= 1220 + 1320 + 1180 + 1170$$

$$= 4890$$

$$\text{Required ratio} = 5370 : 4890$$

$$= 179 : 163$$

121. (b) Total sale of Type D geyser

$$= 98 + 112 + 109 + 102 + 124 + 134 = 679$$

Total sale of Type A geyser

$$= 75 + 100 + 105 + 100 + 95 + 85 = 560$$

Total sale of Type C geyser

$$= 103 + 103 + 112 + 123 + 102 + 134 = 677$$

Total sale of Type B geyser

$$= 122 + 102 + 108 + 189 + 123 + 145 = 789$$

Hence Required Answer is (b).

$$122. (c) \text{Average \% of History} = \frac{90}{200} \times 100 = 45\%$$

$$\text{Average \% of Geography} = \frac{35}{100} \times 100 = 35\%$$

$$\text{Average \% of Mathematics} = \frac{88}{200} \times 100 = 44\%$$

$$\text{Average \% of Science} = \frac{120}{200} \times 100 = 60\%$$

$$\text{Average \% of English} = \frac{90}{150} \times 100 = 60\%$$

Hence, Required answer is (c) Science and English.

123. (b) Given,
 People below the age of 36 years = 30 million
 $\Rightarrow (15.00 + 20.25 + 16.75)\%$
 $= 30 \text{ million}$
 $\Rightarrow 52\% = 30 \text{ million}$
 $\Rightarrow 1\% = \frac{30}{52} \text{ million}$
 The number of people to the age group 56 – 65 is:
 $\Rightarrow 5.50\% = \frac{30}{52} \times 5.5 = 3.17 \text{ million}$
124. (b) Number of students scoring less than 50% marks
 $= 270 + 120 + 300 + 220 + 200 = 1110$
 Number of students scoring more than 50% marks
 $= 55\% \text{ of } 600 + 40\% \text{ of } 400 + 20\% \text{ of } 375 + 10\% \text{ of } 350 + 25\% \text{ of } 300$
 $= 330 + 160 + 75 + 35 + 75 = 675$
 Total number of students
 $= 600 + 400 + 375 + 350 + 300 = 2025$
 Exactly 50% scoring students
 $= 2025 - (1110 + 675) = 240$
 Required Ratio = $1110 : 240 = 111 : 24$
125. (c) Increment% production in sprite
 $= \frac{5800 - 5400}{5400} \times 100\% = 7.40\%$
 Increment% production in Cocacloa
 $= \frac{5600 - 5300}{5300} \times 100\% = 5.66\%$
 Increment% production in Pepsi
 $= \frac{6800 - 6000}{6000} \times 100\% = 13.33\%$
 Increment% production in Fanta
 $= \frac{2700 - 1800}{1800} \times 100\% = 50\%$
 Thus maximum % increment in 'Fanta'.
126. (d) Average sales of companies B and D in 2012
 $= \frac{18 + 21}{2} = \frac{39}{2} = 19.5$
 Average sales of companies A and E in 2011
 $= \frac{11 + 18}{2} = \frac{29}{2} = 14.5$
 Required percentage $= \frac{14.5}{19.5} \times 100\% = 74.36\%$
127. (c) Maximum number of centruies scored in 2019 = 5
128. (c) We can see in the figure
 Cricketer B has scored maximum number of centuries = 5
129. (d) Number of centuries scored by A = 3
 Number of centruies scored by E = 3
 Hence, Answer (d).

130. (b) Overall Average % of Chemistry
 $= \frac{90 + 75 + 65 + 85 + 95 + 90}{6} = \frac{500}{6} = 83.33\%$
 Overall Average % of Geography
 $= \frac{80 + 85 + 95 + 95 + 95 + 90}{6} = \frac{540}{6} = 90\% = 90\%$
 Overall Average % of History
 $= \frac{70 + 85 + 90 + 90 + 90 + 90}{6} = \frac{515}{6} = 85.83\%$
 Overall Average % of CS
 $= \frac{95 + 90 + 80 + 85 + 80 + 90}{6} = \frac{520}{6} = 86.67\%$
 Hence, Answer (b) Geography.
131. (c) Revenue in year 2016
 $= 50 \text{ lakhs} + 30\% \text{ of } 50 \text{ lakhs} = 50 \text{ lakhs} + 15 \text{ lakhs}$
 $= 65 \text{ lakhs}$
132. (c) Average Export from the year 2000 to 2004–
 $= \frac{60 + 110 + 120 + 120 + 150}{5} = \frac{560}{5} = 112$
133. (a) Average wages for task T1
 $= \frac{4 + 2 + 3 + 4 + 5 + 3}{6} = \frac{21}{6}$
 Average wages for task T3
 $= \frac{3 + 4 + 5 + 4 + 3 + 4}{6} = \frac{23}{6}$
 Difference $= \frac{23}{6} - \frac{21}{6} = \frac{2}{6} = \frac{1}{3}$
134. (a) In the given table, you can see that the production of barley is continuously increasing.
135. (a) Production of Activated Carbon Masks in month of April and June = 250
 Hence Answer (a) April and June
136. (b) The average number of patients visiting the dental clinic for Cleaning and polishing of teeth, Fixing crowns and bridging and Teeth whitening.
 $= \frac{(410 + 880 + 360) + (160 + 970 + 270) + (520 + 680 + 530) + (440 + 590 + 280)}{12}$
 $= \frac{1650 + 1400 + 1730 + 1310}{12} = \frac{6090}{12} = 507.5$
 The average number of patients visiting the dental clinic or Orthodontic treatment
 $= \frac{680 + 790 + 460 + 1020}{4} = \frac{2950}{4} = 737.5$
 Now, Difference = $737.5 - 507.5 = 230$
 The percentage of patients $= \frac{230}{737.5} \times 100\% = 31.2\%$
 Answer (b) Less by 31.2%

137. (c) $75\% = \frac{3}{4} \rightarrow$ Female
 $\frac{1}{4} \rightarrow$ Total

Male : Female = 1 : 3

138. (a) Number of Male Teachers in Hindi
 = 20% of 50 = 10

Number of Male Teachers in English
 = 10% of 40 = 4

Number of Male Teachers in Mathematics
 = 65% of 60 = 39

Number of Male Teachers in Science
 = 50% of 30 = 15

Number of Male Teachers in Social Science
 = 25% of 40 = 10

Hence, the maximum number of male teachers are in Mathematics.

139. (b) Total Marks of student A
 = 60 + 70 + 80 = 210

Total Marks of student B
 = 50 + 45 + 55 = 150

Total Marks of student C
 = 70 + 60 + 55 = 185

Total Marks of student D
 = 75 + 80 + 75 = 230

Hence, D has secured first rank.

140. (a)

Scores	Frequency (f)	x	fx
0 - 10	2	5	10
10 - 20	4	15	60
20 - 30	12	25	300
30 - 40	21	35	735
40 - 50	6	45	270
50 - 60	3	55	165
60 - 70	2	65	130
Total	50		1670

$$\text{Mean} = \frac{\sum fx}{\sum f} = \frac{1670}{50} = 33.4$$

141. (d) Required percentage = $\frac{31}{20} \times 100\% = 155\%$

142. (d) Required percentage = $\frac{22}{21} \times 100\% = 104.76\%$

143. (a) Average of students playing rugby, hockey, badminton and squash -

$$= \frac{30 + 60 + 20 + 10}{4} = \frac{120}{4} = 30$$

Average of students playing tennis and football-

$$= \frac{20 + 80}{2} = \frac{100}{2} = 50$$

Required percentage = $\frac{30}{50} \times 100\% = 60\%$

144. (b) Number of students opting Economics = 75
 Number of students opting Physical Education = 125
 Hence, Required Ratio = 75 : 125 = 3 : 5

145. (b) Total number of students of all subjects in 2020 and only Geography in 2021
 = 75 + 100 + 60 + 125 + 75 + 75 = 510

146. (b) Total distance covered by the first employee during the first three days
 = 200 + 300 + 200 = 700

Total distance covered by the second employee during the last three days-

$$= 250 + 350 + 100 = 700$$

Hence, Required Ratio = 1:1

147. (a) The number of students participated in science olympiad-

$$= 100 + 100 + 150 + 200 + 80 = 630$$

The number of students participated in GK olympiad-
 = 182 + 200 + 120 + 130 + 183 = 815

$$\text{Increment} = 815 - 630 = 185$$

Required Increment Percentage

$$= \frac{185}{630} \times 100\% = 29.365\% \text{ i.e. } 29.37\%$$

148. (a) In Entertainment Sector-

Successful Startup : Total Startup

$$= 175 : 560 = 5 : 16$$

149. (d) The ratio of the number of successful start-ups to that of unsuccessful start-ups in Fintech sector

$$= 104 : (256 - 104)$$

$$= 104 : 152 = 13 : 19$$

150. (c) Income from Market Tax, 26%

$$= 260 \text{ Crore}$$

Income from other Taxes

$$= (40 + 12 + 16 + 6)\%$$

$$= 74\%$$

Hence, Required Income - 74%

$$= 740 \text{ Crore}$$

151. (d) Money spent on Basketball

$$= 12000000 \times \frac{25}{100} = 3000000$$

152. (b) Given,

Total Marks = 1800

Difference b/w the marks of Maths and Science

$$= 1800 \times \frac{84 - 82}{360} = 1800 \times \frac{2}{360} = 10$$

153. (c) In 1996, the percentage increase in FDI over the previous year was the highest.

154. (b) Population in 2006 = 9.5

Population in 2007 = 11.4

Percentage increase

$$= \frac{1.9}{9.5} \times 100\% = 20\%$$

155. (d) Total Production in 1994 = 237
Total Production in 1998 = 334
Increase Percentage

$$= \frac{97}{237} \times 100\% = 40.92\% = 41\%$$

156. (c) Required Ratio = $31\% : \frac{69}{4}\%$
= 124 : 69

157. (c) Average number of units sold by the company per year

$$= \frac{1.7 + 1.5 + 1.0 + 1.4 + 2.1}{5} = \frac{7.7}{5} = 1.54$$

Since, The given data is in hundreds.
Required Answer = $1.54 \times 100 = 154$

158. (a) The quantity of E used in month of March = 308
Total quantity used in month of May
= $270 + 390 + 280 + 250 + 350 = 1540$
Required percentage

$$= \frac{308}{1540} \times 100\% = 20\%$$

159. (b) In 2007, the percentage of type E cars sold out of the total numbers of cars sold was minimum.

160. (b) The average number of delivery partners who joined Twiggy in the last 6 years

$$= \frac{1.2 + 1.5 + 2.4 + 2.8 + 3.2 + 3.6}{6} = 2.45$$

Since, the given data is in Thousands.

So,

Required Average = $2.45 \times 1000 = 2450$

161. (a) Total number of passed students = 112

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