



Government of Tamilnadu

Department of Employment and Training

Course : TNPSC Group I Mains Material
Subject : General Aptitude & Mental Ability
Topic : **Percentage**

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Percentage

Introduction

We have already been introduced to the concepts such as 'Ratio and proportion', unitary method and its use in solving day-to-day application problems. Also, ratio has been explained as a method of comparison by division. One of the most common methods to compare two quantities is by using percentage.

Situation

Geetha scored 475 marks out of 600 and Seetha scored 425 out of 500. Can we conclude Geetha has scored higher marks than Seetha? Is it right? Whom do you think has done better? We cannot decide who has done better by just comparing the marks, they have scored because the maximum marks in both the cases are different.

Per cent is derived from the Latin word 'Per centum' meaning 'per hundred'. Per cent is denoted by the symbol '%' and means hundredth too. That is 1% means 1 out of hundred or one hundredth which can be written as $1\% = 1/100 = 0.01$. It is read as 1 per cent.

- In the same way, 50% means 50 out of hundred or fifty hundredth. That is $50\% = 50/100$
- 80% means 80 out of hundred or eighty hundredth. That is $80\% = 80/100$
- 20% means 20 out of hundred or twenty hundredth. That is $20\% = 20/100$

Converting Fraction to Percentage

- All numbers which are represented using numerator and denominator are fractions.
- They can have any number as a denominator. If the denominator of the fraction is hundred then it can be very easily expressed as a percentage.

1. There are 250 students in a school. 55 students like basketball, 75 students like football, 63 students like throw ball, while the remaining like cricket. What is the percent of students who like (a) basket ball? (b) throw ball?

Solution:

Total number of students = 250

(a) Number of students who like basket ball = 55

55 out of 250 like basket ball which can be represented as $\frac{55}{250}$

Percentage of students who like basket ball = $(\frac{55}{250} \times 100)\% = 22\%$

(b) Number of students who like throw ball = 63

63 out of 250 like throw ball and that can be represented as $\frac{63}{250}$

Percentage of students who like throw ball = $(\frac{63}{250} \times 100)\% = 25.2\%$.

22% like basket ball, 25.2% like throw ball.

2. In a class of 35 students, 7 students were absent on a particular day. What percentage of the students were absent?

Solution:

Number of students were absent = 7

Percentage of students absent = $\frac{7}{35} \times 100 = 20\%$.

3. Ram bought 36 mangoes; 5 mangoes were rotten. What is the percentage of mangoes were rotten?

Solution:

Number of mangoes bought = 36

Percentage of mangoes rotten = $\frac{5}{36} \times 100 = 13.89\%$.

4. In a class of 50, 23 were girls, and the rest were boys. What is the percentage of girls and boys?

Solution:

Number of students in a class = 50; Number of girls in a class = 23

Number of boys in a class = 27

Percentage of girls in a class = $\frac{23}{50} \times 100 = 46\%$

Percentage of boys in a class = $100 - 46 = 54\%$.

5. Ravi got 66 marks out of 75 in mathematics and 72 out of 80 in science. In which subject did he score more?

Solution:

Ravi got 66 marks in mathematics

$$\text{Percentage of marks Ravi score in mathematics} = \frac{66}{75} \times 100 = 88\%$$

$$\text{Percentage of marks Ravi score in Science} = \frac{72}{80} \times 100 = 90\%$$

Ravi score more marks in Science.

6. Shyam's monthly income is ₹ 12,000. He saves ₹ 1,200. Find the percent of his savings and expenditure.

Solution:

Shyam's income = ₹ 12,000

His saving = ₹ 1,200

$$\text{Percentage of savings} = \frac{1200}{12000} \times 100 = 10\%$$

$$\text{Percentage of expenditure} = 100 - 10 = 90\%.$$

7. In a class of 70, 60% are boys. Find the number of boys and girls

Solution:

Total number of students = 70

$$\text{Number of boys} = 60\% \text{ of } 70 = \frac{60}{100} \times 70 = 42.$$

Number of boys = 42.

$$\begin{aligned} \text{Number of girls} &= \text{Total students} - \text{Number of boys} \\ &= 70 - 42 \quad \text{Number of girls} = 28. \end{aligned}$$

8. In 2010, population of a town is 1,50,000. If it is increased by 10% in next year, find the population in 2011.

Solution:

Population in 2010 = 1,50,000

$$\text{Increase in population} = \frac{10}{100} \times 150000 = 15000$$

$$\text{Population in 2011} = 150000 + 15000 = \mathbf{1,65,000}.$$

9. Ram spent 25% of his income on rent. Find the amount spent on rent, if his income is ₹ 5,000.

Solution:

$$\begin{aligned}\text{Ram spent on rent} &= 25\% \text{ of income} \\ &= \frac{25}{100} \times 25000 \\ &= ₹ 6,250.\end{aligned}$$

10. A team played 25 matches in a season and won 36% of them. Find the matches won by team.

Solution:

$$\begin{aligned}\text{Matches won by team} &= 36\% \text{ of Matches} \\ &= \frac{36}{100} \times 25 = 9 \text{ Matches.}\end{aligned}$$

11. The population of a village is 32,000. 40% of them are men. 25% of them are women and the rest are children. Find number of men and children.

Solution:

$$\begin{aligned}\text{Population of village} &= 32,000 \\ \text{No. of Men} &= \frac{40}{100} \times 32000 \\ &= 12,800 \text{ Men} \\ \text{No. of Children} &= \frac{35}{100} \times 32000 \\ &= 11,200 \text{ Children.}\end{aligned}$$

Percentage of children
= 100 - (40+25)
= 35%

12. The value of an old car is ₹ 45,000. If the price decrease by 15%. Find its new price?

Solution:

$$\begin{aligned}\text{Value of old Car} &= 45000 \\ \text{Price decrease by } 15\% &= \frac{15}{100} \times 45000 \\ &= 6,750 \\ \text{New price} &= 45000 - 6750 \\ &= ₹ 38,250.\end{aligned}$$

13. The percentage of literacy in a village is 47%. Find the number of illiterates in village, if population is 7,500.

Solution:

Percentage of literacy = 47%; Percentage of Illiteracy = 53%

$$\begin{aligned}\text{Number of illiterates} &= \frac{53}{100} \times 7500 \\ &= 3,975 \text{ illiterates.}\end{aligned}$$

14. Find the total amount if 12% of it is ₹ 1080

Solution:

Let the total amount be x .

12% of Total amount = ₹ 1,080

$$\begin{aligned}\frac{12}{100} \times x &= 1080 \\ x &= \frac{1080 \times 100}{12} = 9000\end{aligned}$$

The total amount = ₹ 9,000.

15. 72% of 25 students are good in Mathematics. How many are not good in mathematics?

Solution:

Percentage of students good in Mathematics = 72%

Number of students good in Mathematics = 72% of 25 students

$$\text{Number of students good in Mathematics} = \frac{72}{100} \times 25 = 18 \text{ students}$$

Number of student not good in Mathematics = $25 - 18 = 7$.

16. The price of a house is decreased from Rupees 15 lakhs to Rupees 12 lakhs. Find the percentage of decrease.

Solution:

Original price = ₹ 15,00,000

Change in price = ₹ 12,00,000

$$\text{Decrease in price} = 15,00,000 - 12,00,000 = 3,00,000$$

$$\begin{aligned}\text{Percentage of decrease} &= \frac{300000}{1500000} \times 100 \\ &= 20\%.\end{aligned}$$

17. There are 5 oranges in a basket of 25 fruits. The percentage of oranges is

Solution:

$$\begin{aligned}\text{Percentage of orange} &= \frac{5}{25} \times 100 \\ &= 20\%.\end{aligned}$$

18. 15% of total number of biscuits in a bottle is ₹ 30. Total number of biscuits is

Solution:

$$\begin{aligned}\frac{15}{100} \times x &= 30 \\ x &= \frac{30 \times 100}{15} = 200 \text{ Biscuits.}\end{aligned}$$

19. The price of a scooter was ₹ 34,000 last year. It has increased by 25% this year. Then the increase in price is

Solution:

Price of Scooter = ₹ 34,000

$$\text{Increased by } 25\% = \frac{25}{100} \times 34000$$

Increase in price = ₹ 8,500.

20. A man saves ₹ 3,000 per months from his total salary of ₹ 20,000. The percentage of his savings is

Solution:

$$\begin{aligned}\text{Percentage of savings} &= \frac{3000}{20000} \times 100 \\ &= 15\%.\end{aligned}$$

21. 20% of total quantity of oil is 40 litres. Find the total quantity of oil in litres.

Solution:

20 % of total quantity = 40 Litres

$$\begin{aligned}\text{Total quantity, } \frac{20}{100} \times x &= 40 \\ x &= \frac{40 \times 100}{20} \\ &= 200 \text{ Litres.}\end{aligned}$$

22. 25% of journey covers 5,000 km. How long is the journey?

Solution:

$$\begin{aligned}\text{Total journey, } \frac{25}{100} \times x &= 5000 \\ x &= \frac{5000 \times 100}{25} \\ &= 20,000 \text{ km.}\end{aligned}$$

23. 3.5% of an amount is ₹ 54.25. Find the amount.

Solution:

$$\begin{aligned}\frac{3.5}{100} \text{ of } x &= 54.25 \\ x &= \frac{54.25 \times 100}{3.5} \\ &= \frac{54250}{35} \\ \text{Amount} &= ₹ 1,550.\end{aligned}$$

24. 60% of total time is 30 minutes. Find total time?

Solution:

$$\begin{aligned}\frac{60}{100} \times x &= 30 \\ x &= \frac{3000}{60}\end{aligned}$$

Total Time = 50 minutes.

25. 4% of sales tax on a sale of an article is ₹ 2 what is the amount of sale?

Solution:

$$\begin{aligned}\text{Amount of sale, } \frac{40}{100} \times x &= 2 \\ x &= \frac{200}{4} \\ &= ₹ 50.\end{aligned}$$

26. Meenu spends ₹ 2,000 from her salary for recreation which is 5% of her salary. What is her salary?

Solution:

$$\frac{5}{100} \times x = 2000$$
$$x = \frac{2000 \times 100}{5}$$

Her salary is = ₹ 40,000.

27. 25% of total mangoes which are rotten is 1250. Find the total number of mangoes in the basket. Also, find the no of good mangoes.

Solution:

$$\frac{25}{100} \text{ of } x = 1250$$
$$\text{Total mangoes, } x = \frac{1250 \times 100}{25}$$
$$= 5000.$$
$$\text{No. of good mangoes} = 5000 - 1250$$
$$= 3,750.$$

28. A school cricket team played 20 matches against another school. First school won 25% of them. How many matches did first School win?

Solution:

Total matches = 20; 1st won % = 25

$$\text{No. of matches win} = \frac{25}{100} \times 20$$
$$= 5 \text{ Matches.}$$

29. Rahim deposited ₹ 10,000 in a company which pays 18% SI p.a. Find the interest he gets for a period of 5 years?

Solution:

$$\text{SI} = \frac{10000 \times 18 \times 5}{100}$$
$$= ₹ 9,000.$$

30. The marked price of a toy is ₹ 1,200. The shop keeper gave a discount of 15%. What is the selling price of the toy?

Solution:

Marked price = 1200; Discount = 15%

$$\begin{aligned}\text{Discount Amount} &= \frac{5}{100} \times 1200 \\ &= 180\end{aligned}$$

$$\begin{aligned}\text{S.P} &= 1200 - 180 \\ &= ₹ 1,080.\end{aligned}$$

31. In an interview for a computer firm 1,500 applicants were interviewed. If 12% of them were selected, how many applicants were selected? Also find the number of applicants who were not selected.

Solution:

$$\begin{aligned}\text{No. of applicates selected} &= \frac{12}{100} \times 1500 \\ &= 180\end{aligned}$$

$$\begin{aligned}\text{No. of applicates not selected} &= 1500 - 180 \\ &= 1,320.\end{aligned}$$

32. An alloy consists of 30% copper and 40% zinc and the remaining is nickel. Find the amount of nickel in 20 kilograms of the alloy.

Solution:

30% Copper; 40% Zinc; Nickel 30%

$$\begin{aligned}\text{Amount of Nickel in 20 kg of alloy} &= \frac{30}{100} \times 20 \\ &= 6 \text{ kg.}\end{aligned}$$

33. Pandian and Thamarai contested for the election to the Panchayat committee from their village. Pandian secured 11,484 votes which was 44% of the total votes. Thamarai secured 36% of the votes. Calculate (i) the number of votes cast in the village and (ii) the number of voters who did not vote for both the contestants.

Solution:

$$\text{i) Total votes, } \frac{44}{100} \times x = 11484$$

$$x = \frac{11484 \times 100}{44}$$

$$x = 26,100 \text{ Votes.}$$

$$\begin{aligned} \text{ii) \% of voters did not vote for both contestants} &= 100 - (44 + 36) \\ &= 20\% \end{aligned}$$

$$\begin{aligned} \text{No of voters did not vote for both contestants} &= \frac{20}{100} \times 26100 \\ &= 5220. \end{aligned}$$

34. A man spends 40% of his income for food, 15% for clothes and 20% for house rent and saves the rest. What is the percentage of his saving? If his income is ₹ 34,400, find the amount of his savings.

Solution:

$$\begin{aligned} \text{Percentage of savings} &= 100 - (40 + 15 + 20) \\ &= 25\% \end{aligned}$$

$$\begin{aligned} \text{Amount of savings} &= \frac{25}{100} \times 34400 \\ &= ₹ 8,600. \end{aligned}$$

35. Jyothika secured 35 marks out of 50 in English and 27 marks out of 30 in Mathematics. In which subject did she get more marks and how much?

Solution:

$$\begin{aligned} \text{Marks secured in English} &= \frac{35}{50} \times 100 \\ &= 70 \end{aligned}$$

$$\begin{aligned} \text{Marks secured in Maths} &= \frac{27}{30} \times 100 \\ &= 90 \end{aligned}$$

She get more marks in Mathematics by 20 Marks.

36. A worker receives ₹ 11,250 as bonus, which is 15% of his annual salary. What is his monthly salary?

Solution:

$$\text{Annual Salary, } \frac{15}{100} \times x = 11250$$

$$x = \frac{11250 \times 100}{15}$$

$$x = 75,000 \text{ Annual Salary}$$

$$\text{Monthly Salary} = \frac{75000}{12}$$

$$= ₹ 6,250.$$

37. The price of a suit is increased from ₹ 2,100 to ₹ 2,520. Find the percentage of increase.

Solution:

$$\text{Price increased} = 2520 - 2100$$

$$= ₹ 420$$

$$\text{Percentage of price increase} = \frac{420}{2100} \times 100$$

$$= 20\%.$$