Government of Tamilnadu

Department of Employment and Training

Course : TNPSC Group I Mains Material

Subject : General Aptitude & Mental Ability

Topic : **Time and Work**

Commissioner,
Department of Employment and Training.

Time and Work

Work to be done is usually considered as one unit. Work can be in any form like building a wall, making a road, filling or emptying a tank, or even eating a certain amount of food. Time is measured in hours, days etc., Certain assumptions are made that the work so done is uniform and each person shares the same work time in case of group work in completing the work.

Unitary Method:

If two persons X and Y can do some work individually in a and b days, then their one day's work is $\frac{1}{a}$ and $\frac{1}{b}$ respectively.

Also, their one day's work together $\frac{1}{a}+\frac{1}{b}=\frac{a+b}{ab}$

Thus, X and Y together can complete the work in $\frac{a+b}{ab}$ days.

If A is a /b times as good a worker as B, then A will take b /a of the time taken by B to complete the work.

Sharing of the money for work

When a group of people do some work together, based on their individual work, they get a share of money themselves. In general, money earned is shared by people, who worked together, in the ratio of the total work done by each of them.

If the ratio of the time taken by A and B in doing a work is x : y, then the ratio of work done by A and B is $\frac{1}{x}:\frac{1}{y}=y:x$ This is the ratio for their separate wages too.

If three persons A, B and C can do a work in x, y and z days respectively, then the ratio in which their wages will be distributed to them is $\frac{1}{x}:\frac{1}{y}:\frac{1}{z}$

1. Six men can complete a work in 12 days. After second day, 6 more men joined with them. How many days will they take to complete the remaining work?

Solution:

$$6 \times 12 = (2 \times 6) + (12 + x)$$
$$72 = 12 + 12x$$
$$60 = 12x$$
$$x = \textbf{5 days.}$$

5 days take to complete the remaining work.

2. If cost of 16 pencils is ₹ 48, find the cost of 4 pencils?

Solution: (Direct Proportion)

Cost of 16 pencils = ₹ 48

Cost of 4 pencils = $\frac{48}{4}$ = **₹ 12.**

3. A car travels 360 km in 4 hrs Find the distance it covers in 6 hrs 30 mins at some speed.

Solution:

$4 : 360 :: 13/2 : x$

$$4x = 360 \times \frac{13}{2}$$
$$x = \textbf{585 km.}$$

4. If the cost of 8 kgs of rice is ₹ 160, then the cost of 18 kgs of rice is?

Solution:

Cost of 8 kg of rice = 160

Cost of 1 kg of rice = $\frac{160}{8} = 20$

Cost of 18 kg of rice = 20×18 = **₹ 360.**

5. 7 men can complete a work in 52 days. In how many days will 13 men finish the same work?

Solution: (Inverse Proportion)

$$7 \times 52 = 13 \times x$$
$$13x = 7 \times 52$$
$$x = \textbf{28 days.}$$

13 men complete the work in 28 days.

6. **A book contains 120 pages. Each page contains 35 lines. How many pages will the book be contain if every page has 24 lines per page?**

Solution:

$$120 \times 35 = 24 \times x$$

$$x = \frac{120 \times 35}{24}$$

$$x = \textbf{175 pages.}$$

7. **If the cost of 7 mangoes is ₹ 35, then the cost of 15 mangoes is?**

Solution: (Direct Proportion)

$$7 : 35 :: 15 : x$$

$$7x = 35 \times 15$$

$$x = \textbf{75.}$$

Cost of 15 mangoes ₹ 75.

8. **A train covers a distance of 195 km in 3 hrs At the same speed, how much distance will be covered in 5 hrs.**

Solution:

$$195 : 3 :: x : 5$$

$$3x = 195 \times 5$$

$$x = \textbf{325 km.}$$

325 km travelled in 5 hrs.

9. **If 8 workers can complete a work in 24 days, then 24 workers can complete same work.**

Solution: (Inverse Proportion)

$$8 \times 24 = 24x$$

$$x = \textbf{8.}$$

24 workers complete the work in 8 days.

10. If 18 men can do a work in 20 days, then 24 workers complete the work in ?

Solution:

$$18 \times 20 = 24 \times x$$

$$x = \frac{18 \times 20}{24}$$

$$x = \mathbf{15 \text{ days.}}$$

24 workers complete the work in 15 days.

11. A marriage party of 300 people require 60 kg of vegetables. What is the requirement if 500 people come up for the marriage?

Solution:

$$300 : 60 :: 500 : x$$

$$60 \times 500 = 300 \times x$$

$$x = \frac{60 \times 500}{300}$$

$$x = \mathbf{100.}$$

100 kg vegetables needed for 500 people.

12. 90 teachers are required for a school with a strength of 1500 students. How many teachers are required for a school of 2000 students?

Solution:

$$90 : 1500 :: x : 2000$$

$$1500x = 90 \times 2000$$

$$x = \mathbf{120.}$$

120 teachers required for 2000 students.

13. A car travels 60 km in 45 minutes. At the same rate, how many km will it travel in one hour?

Solution:

$$60 : 45 :: x : 60$$

$$45x = 60 \times 60$$

$$x = \mathbf{80 \text{ km.}}$$

80 km travel in 1 hour.

14. A man whitewashes 96 sq.m. of a compound wall in 8 days. How many sq.m. will be white washed in 18 days?

Solution:

$96 : 8 :: x : 18$

$$8x = 96 \times 18$$

$$x = \textbf{216 sq.m.}$$

216 sq.m whitewashed in 18 days.

15. 7 boxes weigh 36.4 kg. How much will 5 such box weight?

Solution:

7 boxes weight = 36.4 kg

$$1 \text{ box weight} = \frac{36.4}{7}$$

$$\text{Weight of 5 boxes} = \frac{36.4}{7} \times 5$$

$$= \textbf{26 kg.}$$

16. A car takes 5 hours to cover a particular distance at a uniform speed of 60 km/hr. How long will it take to cover the same distance at a uniform speed of 40 km/hr.

Solution: (Inverse Proportion)

$$60 \times 5 = 40 \times x$$

$$x = \frac{60 \times 5}{40}$$

$$x = \textbf{7.5 hrs.}$$

17. 150 men can finish a work in 12 days. How many days will 120 men take to finish the same work?

Solution:

$$150 \times 12 = 120 \times x$$

$$x = \frac{150 \times 12}{120}$$

$$x = \textbf{15 days.}$$

120 men finish the work in 15 days.

18. A troop has provision for 276 soldiers for 20 days. How many soliders leave the troop so that the provision may last for 46 days?

Solution:

$$276 \times 20 = 46x$$

$$x = \frac{276 \times 20}{46}$$

$$x = \mathbf{120.}$$

276 − 120 = 156 soldiers leave the troop.

19. A book has 70 pages with 30 lines of printed matter on each page. If each page is to have only 20 lines of printed matter. How many pages will be book have?

Solution:

$$70 \times 30 = 20 \times x$$

$$x = \frac{70 \times 30}{20}$$

$$x = \mathbf{105\ pages.}$$

The book has 105 pages.

20. There are 800 solidiers in an army camp. There is enough provision for them for 60 days. If 400 solidiers join the camp, for how many days will the provisions last?

Solution:

$$800 \times 60 = 1200 \times x$$

$$x = \frac{800 \times 60}{1200}$$

$$x = \mathbf{40\ days.}$$

In 40 days the provisions will last.