

Arithmetic (Level 1)**Question Paper, Set 01**

Time: 1 hour 30 minutes

Maximum marks: 50

Name: _____ Class: _____ Date: _____

1. Answer all 20 questions. The marks for each question are shown in brackets.
2. Show your working for the 2, 3 and 5 mark questions.
3. The key sheet and worked solutions are at the end of this paper.

1. Express $36 : 48$ in its simplest form. [1 mark]
2. Divide ₹840 between Ravi and Sita in the ratio $3 : 4$. [2 marks]
3. The monthly salaries of Kiran and Arun are in the ratio $3 : 5$. If the salary of each is increased by ₹3000, the new ratio becomes $15 : 23$. Find Arun's salary after the increase. [5 marks]
4. Find x if $7 : x :: 21 : 36$. [1 mark]
5. Find the mean proportional between 12 and 75. [2 marks]
6. If 9 m of cloth costs ₹585, find the cost of 1 m of the same cloth. [1 mark]
7. 48 men can do a piece of work in 35 days. How many men will do the same work in 28 days? [3 marks]
8. Express 35% as a fraction in its simplest form. [1 mark]
9. What percentage of 3 kg is 450 g? [2 marks]
10. (i) By what percent is 96 more than 80? (ii) By what percent is 80 less than 96? [3 marks]
11. If Rahul's salary is 25% more than Ajay's, by what percent is Ajay's salary less than Rahul's? [2 marks]
12. A shopkeeper buys 150 eggs at ₹6 each. 6 eggs break on the way. He sells the remaining eggs at ₹78 a dozen. Find his profit or loss and its percentage. [5 marks]
13. The marked price of a shirt is ₹1250 and the shop gives a discount of 12%. Find the discount and the selling price. [3 marks]
14. Two watches are sold for ₹990 each. One is sold at a profit of 10% and the other at a loss of 10%. Find the gain or loss percent on the whole. [2 marks]
15. Find the average of 14, 22, 27, 31, 36. [1 mark]
16. The average weight of 24 students in a class is 40 kg. If the weight of the teacher is included, the average rises by 1 kg. Find the weight of the teacher. [5 marks]

- 17.** Convert 72 km/h into m/s. [1 mark]
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- 18.** Deepak drives to his office at 30 km/h and returns home by the same road at 20 km/h. Find his average speed for the whole journey. [3 marks]
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- 19.** Find the simple interest on ₹2400 at 7% per annum for 3 years. [2 marks]
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- 20.** Find the amount and the compound interest on ₹8000 for 2 years at 5% per annum, compounded annually. [5 marks]
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Key sheet

Q	Answer
1	3 : 4
2	₹360 and ₹480
3	₹23,000
4	$x = 12$
5	30
6	₹65
7	60 men
8	$\frac{7}{20}$
9	15%
10	(i) 20% (ii) $16\frac{2}{3}\%$
11	20%
12	Profit ₹36; 4%
13	Discount ₹150; S.P ₹1100
14	Loss of 1%
15	26
16	65 kg
17	20 m/s
18	24 km/h
19	₹504
20	Amount ₹8820; C.I ₹820

Solutions

1. Express 36 : 48 in its simplest form. [1]

H.C.F of 36 and 48 is 12.

$$\frac{36}{48} = \frac{12 \times 3}{12 \times 4} = \frac{3}{4}$$

Simplest form = 3 : 4

Ans: 3 : 4

2. Divide ₹840 between Ravi and Sita in the ratio 3 : 4. [2]

Sum of the terms of the ratio = $3 + 4 = 7$

First part = $\frac{3}{7} \times 840 = 360$

Second part = $\frac{4}{7} \times 840 = 480$

Ans: ₹360 and ₹480

3. The monthly salaries of Kiran and Arun are in the ratio 3 : 5. If the salary of each is increased by ₹3000, the new ratio becomes 15 : 23. Find Arun's salary after the increase. [5]

Let Kiran's old salary = $3k$ and Arun's old salary = $5k$.

$$\frac{3k+3000}{5k+3000} = \frac{15}{23}$$

$$\Rightarrow (3k + 3000)23 = (5k + 3000)15$$

$$\Rightarrow 69k + 69,000 = 75k + 45,000$$

$$\Rightarrow 69,000 - 45,000 = 75k - 69k$$

$$\Rightarrow 24,000 = 6k \Rightarrow k = 4000$$

$$\text{Arun's new salary} = 5k + 3000 = 20,000 + 3000 = 23,000$$

Ans: ₹23,000

4. Find x if $7 : x :: 21 : 36$. [1]

Product of means = product of extremes.

$$21 \times x = 7 \times 36$$

$$x = \frac{7 \times 36}{21} = 12$$

Ans: $x = 12$

5. Find the mean proportional between 12 and 75. [2]

$$\text{Mean proportional} = \sqrt{12 \times 75}$$

$$= \sqrt{(4 \times 3) \times (3 \times 25)}$$

$$= \sqrt{4 \times 9 \times 25} = 2 \times 3 \times 5 = 30$$

Ans: 30

6. If 9 m of cloth costs ₹585, find the cost of 1 m of the same cloth. [1]

$$9 \text{ m} \rightarrow ₹585$$

$$1 \text{ m} \rightarrow ₹\frac{585}{9} = 65$$

Ans: ₹65

7. 48 men can do a piece of work in 35 days. How many men will do the same work in 28 days? [3]

Days | Men

35 | 48

28 | y

Inverse proportion: $x_1y_1 = x_2y_2$

$$28 \times y = 35 \times 48 \Rightarrow y = \frac{35 \times 48}{28} = 60$$

Ans: 60 men

8. Express 35% as a fraction in its simplest form. [1]

$$35\% = \frac{35}{100} = \frac{7}{20}$$

Ans: $\frac{7}{20}$

9. What percentage of 3 kg is 450 g? [2]

$$3 \text{ kg} = 3 \times 1000 \text{ g} = 3000 \text{ g}$$

$$\left(\frac{450}{3000} \times 100\right)\% = 15\%$$

Ans: 15%

10. (i) By what percent is 96 more than 80? (ii) By what percent is 80 less than 96? [3]

$$\begin{aligned} \text{(i)} & \left[\frac{\text{Greater} - \text{smaller}}{\text{smaller}} \times 100 \right] \% \\ & = \left(\frac{96 - 80}{80} \times 100 \right) \% = \left(\frac{16}{80} \times 100 \right) \% = 20\% \end{aligned}$$

$$\begin{aligned} \text{(ii)} & \left[\frac{\text{Greater} - \text{smaller}}{\text{Greater}} \times 100 \right] \% \\ & = \left(\frac{16}{96} \times 100 \right) \% = 16\frac{2}{3}\% \end{aligned}$$

Ans: (i) 20% (ii) $16\frac{2}{3}\%$

11. If Rahul's salary is 25% more than Ajay's, by what percent is Ajay's salary less than Rahul's? [2]

$$\begin{aligned} \text{If } A \text{ is } R\% \text{ more than } B, \text{ then } B \text{ is less than } A \text{ by } & \left[\frac{R}{100+R} \times 100 \right] \% \\ & = \left(\frac{25}{100+25} \times 100 \right) \% = \left(\frac{25}{125} \times 100 \right) \% = 20\% \end{aligned}$$

Ans: 20%

12. A shopkeeper buys 150 eggs at ₹6 each. 6 eggs break on the way. He sells the remaining eggs at ₹78 a dozen. Find his profit or loss and its percentage. [5]

$$\text{C.P of 150 eggs} = 150 \times 6 = 900$$

$$12 \text{ eggs} \rightarrow 78, \quad 1 \text{ egg} \rightarrow \frac{78}{12} = 6.5$$

$$\text{Remaining eggs} = 150 - 6 = 144$$

$$\text{S.P} = 144 \times 6.5 = 936$$

$$\text{S.P} > \text{C.P} \Rightarrow \text{Profit} = 936 - 900 = 36$$

$$\text{Profit \%} = \left(\frac{36}{900} \times 100 \right) \% = 4\%$$

Ans: Profit ₹36; 4%

13. The marked price of a shirt is ₹1250 and the shop gives a discount of 12%. Find the discount and the selling price. [3]

$$\text{Discount} = 12\% \text{ of } 1250 = \frac{12}{100} \times 1250 = 150$$

$$\text{S.P} = \text{M.P} - \text{Discount} = 1250 - 150 = 1100$$

Ans: Discount ₹150; S.P ₹1100

14. Two watches are sold for ₹990 each. One is sold at a profit of 10% and the other at a loss of 10%. Find the gain or loss percent on the whole. [2]

When two articles have the same S.P, one at $a\%$ profit and the other at $a\%$ loss, there is always a loss of $\left(\frac{a}{10}\right)^2 \%$.

$$\text{Loss } \% = \left(\frac{10}{10}\right)^2 \% = 1\%$$

Check: C.P's are 900 and 1100, total 2000; S.P total 1980; loss 20 on 2000.

Ans: Loss of 1%

15. Find the average of 14, 22, 27, 31, 36. [1]

$$\begin{aligned} \text{Average} &= \frac{\text{Sum of observations}}{\text{No. of observations}} \\ &= \frac{14+22+27+31+36}{5} = \frac{130}{5} = 26 \end{aligned}$$

Ans: 26

16. The average weight of 24 students in a class is 40 kg. If the weight of the teacher is included, the average rises by 1 kg. Find the weight of the teacher. [5]

$$\frac{s_1+s_2+\dots+s_{24}}{24} = 40 \Rightarrow s_1 + \dots + s_{24} = 40(24) \quad (1)$$

$$\frac{s_1+\dots+s_{24}+T}{25} = 40 + 1 \Rightarrow s_1 + \dots + s_{24} + T = 41(25) \quad (2)$$

$$(2) - (1) : T = 41(25) - 40(24)$$

$$= 1025 - 960 = 65$$

Ans: 65 kg

17. Convert 72 km/h into m/s. [1]

$$1 \text{ km/h} = \frac{5}{18} \text{ m/s}$$

$$72 \text{ km/h} = 72 \times \frac{5}{18} = 20 \text{ m/s}$$

Ans: 20 m/s

18. Deepak drives to his office at 30 km/h and returns home by the same road at 20 km/h. Find his average speed for the whole journey. [3]

$$\text{For equal distances at speeds } s_1 \text{ and } s_2: \text{ average speed} = \frac{2s_1s_2}{s_1+s_2}$$

$$= \frac{2 \times 30 \times 20}{30+20} = \frac{1200}{50} = 24 \text{ km/h}$$

Ans: 24 km/h

19. Find the simple interest on ₹2400 at 7% per annum for 3 years. [2]

$$P = 2400, R = 7\%, T = 3 \text{ years}$$

$$\text{S.I} = \frac{P \times T \times R}{100} = \frac{2400 \times 3 \times 7}{100} = 504$$

Ans: ₹504

20. Find the amount and the compound interest on ₹8000 for 2 years at 5% per annum, compounded annually. [5]

$$\begin{aligned}A &= P \left(1 + \frac{R}{100}\right)^n \\&= 8000 \left(1 + \frac{5}{100}\right)^2 = 8000 \times \left(\frac{21}{20}\right)^2 \\&= 8820\end{aligned}$$

$$\text{C.I} = A - P = 8820 - 8000 = 820$$

Ans: Amount ₹8820; C.I ₹820
