

Arithmetic (Level 1)

Question Paper, Set 02

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. Find the ratio of 45 cm to 2 m in its simplest form. [1 mark]
2. Divide ₹3600 among A, B and C in the ratio 2 : 3 : 4. [3 marks]
3. Find the fourth proportional to 6, 14 and 21. [1 mark]
4. Find the mean proportional between 4 and 49. [1 mark]
5. If $a : b = 7 : 3$, find the value of $\frac{a+b}{a-b}$. [2 marks]
6. If 4 kg of rice can be served to 25 people, how much rice is needed for 60 such people? [2 marks]
7. In a camp there is enough food for 900 soldiers for 28 days. Some soldiers left and the food lasted for 36 days. How many soldiers left? [5 marks]
8. Express $\frac{3}{8}$ as a percentage. [1 mark]
9. Find 35% of 260. [1 mark]
10. The price of a watch is ₹750. It is increased by 12%. Find the new price. [2 marks]
11. The population of a town is 25,000. It is increasing at the rate of 4% per annum. Find its population after 2 years. [3 marks]
12. A shopkeeper buys an article for ₹480 and sells it for ₹552. Find his profit percentage. [2 marks]
13. Ravi got a 20% concession on the label price of an article. He sold the article for ₹7200, making a 20% profit on the price he paid. Find the label price. [5 marks]
14. If the cost price of 21 articles is equal to the selling price of 18 articles, find the gain or loss percent. [3 marks]
15. Find the average of the first six prime numbers. [1 mark]
16. A car travels at a speed of 65 km/h for 4 hours 30 minutes. What distance does it cover? [2 marks]
17. The speed of Karthik is 42 km/h and the speed of Ali is 56 km/h. Find the ratio of the times taken by them to cover the same distance. [2 marks]

- 18.** A train 240 m long is running at 54 km/h. How long will it take to cross a platform 360 m long? [3 marks]
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- 19.** A certain sum of money amounts to ₹1380 in 3 years and to ₹1470 in $4\frac{1}{2}$ years at simple interest. Find the sum and the rate of interest. [5 marks]
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- 20.** Find the amount and the compound interest on ₹16,000 at 10% per annum for 1 year, compounded half-yearly. [5 marks]
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Key sheet

Q	Answer
1	9 : 40
2	₹800, ₹1200, ₹1600
3	49
4	14
5	$\frac{5}{2}$
6	9.6 kg
7	200 soldiers
8	37.5%
9	91
10	₹840
11	27,040
12	15% profit
13	₹7500
14	Gain of $16\frac{2}{3}\%$
15	$\frac{41}{6} = 6\frac{5}{6}$
16	292.5 km
17	4 : 3
18	40 s
19	Sum ₹1200; rate 5% per annum
20	Amount ₹17,640; C.I ₹1640

Solutions

1. Find the ratio of 45 cm to 2 m in its simplest form. [1]

$$2 \text{ m} = 2 \times 100 \text{ cm} = 200 \text{ cm}$$

$$\frac{45 \text{ cm}}{200 \text{ cm}} = \frac{45}{200} = \frac{9}{40}$$

$$\text{Ratio} = 9 : 40$$

Ans: 9 : 40

2. Divide ₹3600 among A, B and C in the ratio 2 : 3 : 4. [3]

$$\text{Sum of the terms of the ratio} = 2 + 3 + 4 = 9$$

$$\text{1st share} = \frac{2}{9} \times 3600 = 800$$

$$\text{2nd share} = \frac{3}{9} \times 3600 = 1200$$

$$\text{3rd share} = \frac{4}{9} \times 3600 = 1600$$

Ans: ₹800, ₹1200, ₹1600

3. Find the fourth proportional to 6, 14 and 21. [1]

Let the fourth proportional be x . Then $6 : 14 :: 21 : x$.

$$6 \times x = 14 \times 21$$

$$x = \frac{14 \times 21}{6} = 49$$

Ans: 49

4. Find the mean proportional between 4 and 49. [1]

$$\text{Mean proportional} = \sqrt{4 \times 49} = \sqrt{196} = 14$$

Ans: 14

5. If $a : b = 7 : 3$, find the value of $\frac{a+b}{a-b}$. [2]

By componendo and dividendo, if $a : b = c : d$ then $\frac{a+b}{a-b} = \frac{c+d}{c-d}$.

$$\frac{a+b}{a-b} = \frac{7+3}{7-3} = \frac{10}{4} = \frac{5}{2}$$

Ans: $\frac{5}{2}$

6. If 4 kg of rice can be served to 25 people, how much rice is needed for 60 such people? [2]

People | Rice (kg)

$$25 \mid 4$$

$$60 \mid y$$

Direct proportion: $x_1 y_2 = x_2 y_1$

$$25 \times y = 60 \times 4 \Rightarrow y = \frac{60 \times 4}{25} = 9.6$$

Ans: 9.6 kg

7. In a camp there is enough food for 900 soldiers for 28 days. Some soldiers left and the food lasted for 36 days. How many soldiers left? [5]

Let x soldiers leave. Then $900 - x$ remain.

No. of soldiers and days are in inverse proportion: $x_1y_1 = x_2y_2$

$$900 \times 28 = (900 - x) \times 36$$

$$900 - x = \frac{900 \times 28}{36} = 700$$

$$x = 900 - 700 = 200$$

Ans: 200 soldiers

8. Express $\frac{3}{8}$ as a percentage. [1]

$$\frac{3}{8} = \left(\frac{3}{8} \times 100\right) \% = 37.5\%$$

Ans: 37.5%

9. Find 35% of 260. [1]

$$35\% \text{ of } 260 = \frac{35}{100} \times 260 = 91$$

Ans: 91

10. The price of a watch is ₹750. It is increased by 12%. Find the new price. [2]

$$\text{Final value after an increase of } 12\% = \left(\frac{100+R}{100}\right) P$$

$$= \frac{100+12}{100} \times 750 = \frac{112}{100} \times 750 = 840$$

Ans: ₹840

11. The population of a town is 25,000. It is increasing at the rate of 4% per annum. Find its population after 2 years. [3]

$$\text{Population after } n \text{ years} = P \left(1 + \frac{R}{100}\right)^n$$

$$= 25,000 \left(1 + \frac{4}{100}\right)^2 = 25,000 \times \left(\frac{26}{25}\right)^2$$

$$= 27,040$$

Ans: 27,040

12. A shopkeeper buys an article for ₹480 and sells it for ₹552. Find his profit percentage. [2]

Here S.P > C.P, so there is a profit.

$$\text{Profit} = 552 - 480 = 72$$

$$\text{Profit \%} = \left(\frac{72}{480} \times 100\right) \% = 15\%$$

Ans: 15% profit

13. Ravi got a 20% concession on the label price of an article. He sold the article for ₹7200, making a 20% profit on the price he paid. Find the label price. [5]

Let the label price (M.P) be ₹ x .

$$\text{C.P} = x - 20\% \text{ of } x = \frac{80}{100}x$$

$$\text{S.P} = \frac{100+20}{100} \times \text{C.P}$$

$$\Rightarrow 7200 = \frac{120}{100} \times \frac{80}{100}x$$

$$\Rightarrow x = \frac{7200 \times 100 \times 100}{120 \times 80} = 7500$$

Ans: ₹7500

14. If the cost price of 21 articles is equal to the selling price of 18 articles, find the gain or loss percent. [3]

Let C.P of each = x and S.P of each = y .

$$21x = 18y \Rightarrow \frac{y}{x} = \frac{21}{18} = \frac{7}{6}$$

$y > x$, so there is a gain.

$$\text{Gain \%} = \left(\frac{y}{x} - 1\right) \times 100 = 16\frac{2}{3}\%$$

Ans: Gain of $16\frac{2}{3}\%$

15. Find the average of the first six prime numbers. [1]

The numbers are 2, 3, 5, 7, 11, 13.

$$\begin{aligned}\text{Average} &= \frac{\text{Sum of observations}}{\text{No. of observations}} \\ &= \frac{2+3+5+7+11+13}{6} = \frac{41}{6} = 6\frac{5}{6}\end{aligned}$$

Ans: $\frac{41}{6} = 6\frac{5}{6}$

16. A car travels at a speed of 65 km/h for 4 hours 30 minutes. What distance does it cover? [2]

$$\text{Time} = 4 + \frac{30}{60} = \frac{9}{2} \text{ hours}$$

$$D = S \times T = 65 \times \frac{9}{2} = 292.5 \text{ km}$$

Ans: 292.5 km

17. The speed of Karthik is 42 km/h and the speed of Ali is 56 km/h. Find the ratio of the times taken by them to cover the same distance. [2]

$$s_1 = \frac{d}{T_1}, s_2 = \frac{d}{T_2} \Rightarrow \frac{s_1}{s_2} = \frac{T_2}{T_1}$$

$$T_1 : T_2 = s_2 : s_1 = 56 : 42 = 4 : 3$$

Ans: 4 : 3

18. A train 240 m long is running at 54 km/h. How long will it take to cross a platform 360 m long? [3]

$$\text{Distance} = \text{length of train} + \text{length of platform} = 240 + 360 = 600 \text{ m}$$

$$\text{Speed} = 54 \times \frac{5}{18} = 15 \text{ m/s}$$

$$T = \frac{D}{S} = \frac{600}{15} = 40 \text{ s}$$

Ans: 40 s

19. A certain sum of money amounts to ₹1380 in 3 years and to ₹1470 in $4\frac{1}{2}$ years at simple interest. Find the sum and the rate of interest. [5]

$$P + (\text{S.I for } 4\frac{1}{2} \text{ years}) = 1470$$

$$P + (\text{S.I for 3 years}) = 1380 \dots (1)$$

$$\text{Subtracting: S.I for } 1\frac{1}{2} \text{ years} = 90$$

$$\text{S.I for 3 years} = \frac{3}{\frac{3}{2}} \times 90 = 180$$

$$(1) \Rightarrow P = 1380 - 180 = 1200$$

$$180 = \frac{1200 \times 3 \times R}{100} \Rightarrow R = \frac{180 \times 100}{1200 \times 3} = 5\%$$

Ans: Sum ₹1200; rate 5% per annum

20. Find the amount and the compound interest on ₹16,000 at 10% per annum for 1 year, compounded half-yearly. [5]

$$A = P \left(1 + \frac{R}{100k}\right)^{nk}, \text{ with } k = 2 \text{ (half-yearly)}$$

$$= 16,000 \left(1 + \frac{10}{100 \times 2}\right)^{1 \times 2} = 16,000 \times \left(\frac{21}{20}\right)^2$$

$$= 17,640$$

$$\text{C.I} = 17,640 - 16,000 = 1640$$

Ans: Amount ₹17,640; C.I ₹1640
