

Arithmetic (Level 1)**Question Paper, Set 09**

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 $66 : 121$ in its simplest form. [1 mark]
2. Divide ₹3240 into two parts in the ratio $7 : 11$. [2 marks]
3. The ratio of the area of a square field of side 12 m to that of a rectangular field is $3 : 2$. If the breadth of the rectangular field is 8 m, find the ratio of the perimeter of the square field to that of the rectangular field. [5 marks]
4. The ratio of the length to the width of a rectangular sheet of paper is $7 : 4$. If the width of the sheet is 24 cm, find its length. [1 mark]
5. Find the third proportional to 12 and 18. [2 marks]
6. A worker earns ₹4200 in 7 days. How much does he earn in one day? [1 mark]
7. A varies directly as B and inversely as C . $A = 15$ when $B = 10$ and $C = 4$. Find A when $B = 18$ and $C = 6$. [3 marks]
8. Express $\frac{5}{16}$ as a percentage. [1 mark]
9. If 20% of 90 is greater than 30% of a number by 6, find the number. [2 marks]
10. (i) By what percent is 63 more than 56? (ii) By what percent is 56 less than 63? [3 marks]
11. The price of sugar falls by 20%. By how much percent can a family increase its consumption without increasing its expenditure? [2 marks]
12. By selling a refrigerator for ₹21,600, a dealer suffers a loss of 10%. What is the cost price of the refrigerator? At what price should he sell it to gain 15%? [5 marks]
13. An article is marked at ₹1500. The shopkeeper gives a discount of ₹150 and still makes a profit of ₹270. Find the cost price. [3 marks]
14. A shopkeeper says he sells dal at cost price, but he gives only 800 g for every kg. Find his gain percent. [2 marks]
15. Find the average of 125, 140, 155, 180, 200. [1 mark]

- 16.** The average runs of a cricket player in 12 innings is 40. How many runs must he make in the next innings to increase his average by 3? [5 marks]
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- 17.** Convert 126 km/h into m/s. [1 mark]
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- 18.** A car goes from A to B at 50 km/h and comes back from B to A at 75 km/h. Find the average speed of the car. [3 marks]
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- 19.** The simple interest on ₹1800 for 3 years is ₹270. Find the rate of interest. [2 marks]
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- 20.** Find the amount and the compound interest on ₹12,500 for 2 years at 8% per annum, compounded annually. [5 marks]
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Key sheet

Q	Answer
1	6 : 11
2	₹1260 and ₹1980
3	6 : 5
4	42 cm
5	27
6	₹600
7	$A = 18$
8	31.25%
9	40
10	(i) 12.5% (ii) $11\frac{1}{9}\%$
11	25%
12	C.P ₹24,000; S.P ₹27,600
13	₹1080
14	25%
15	160
16	79 runs
17	35 m/s
18	60 km/h
19	5% per annum
20	Amount ₹14,580; C.I ₹2080

Solutions

1. Express 66 : 121 in its simplest form. [1]

H.C.F of 66 and 121 is 11.

$$\frac{66}{121} = \frac{11 \times 6}{11 \times 11} = \frac{6}{11}$$

Simplest form = 6 : 11

Ans: 6 : 11

2. Divide ₹3240 into two parts in the ratio 7 : 11. [2]

Sum of the terms of the ratio = 7 + 11 = 18

First part = $\frac{7}{18} \times 3240 = 1260$

Second part = $\frac{11}{18} \times 3240 = 1980$

Ans: ₹1260 and ₹1980

3. The ratio of the area of a square field of side 12 m to that of a rectangular field is 3 : 2. If the breadth of the rectangular field is 8 m, find the ratio of the perimeter of the square field to that of the rectangular field. [5]

$$\frac{a^2}{l \times b} = \frac{3}{2}$$

$$\Rightarrow \frac{12 \times 12}{l \times 8} = \frac{3}{2}$$

$$\Rightarrow l = \frac{144 \times 2}{8 \times 3} = 12 \text{ m}$$

$$\text{Required ratio} = \frac{4a}{2(l+b)} = \frac{4 \times 12}{2(12+8)} = \frac{48}{40} = \frac{6}{5}$$

Ratio = 6 : 5

Ans: 6 : 5

4. The ratio of the length to the width of a rectangular sheet of paper is 7 : 4. If the width of the sheet is 24 cm, find its length. [1]

$$l : 24 = 7 : 4$$

$$\frac{l}{24} = \frac{7}{4}$$

$$l = \frac{7 \times 24}{4} = 42 \text{ cm}$$

Ans: 42 cm

5. Find the third proportional to 12 and 18. [2]

Let the third proportional be c . Then 12 : 18 :: 18 : c .

$$12 \times c = 18 \times 18$$

$$c = \frac{324}{12} = 27$$

Ans: 27

6. A worker earns ₹4200 in 7 days. How much does he earn in one day? [1]

7 days → ₹4200

1 day → ₹ $\frac{4200}{7} = 600$

Ans: ₹600

7. A varies directly as B and inversely as C . $A = 15$ when $B = 10$ and $C = 4$. Find A when $B = 18$ and $C = 6$. [3]

$$A \propto \frac{B}{C} \Rightarrow A = \frac{kB}{C} \dots (1)$$

$$15 = \frac{k(10)}{4} \Rightarrow k = 6$$

$$(1) \Rightarrow A = \frac{6B}{C} = \frac{6 \times 18}{6} = 18$$

Ans: $A = 18$

8. Express $\frac{5}{16}$ as a percentage. [1]

$$\frac{5}{16} = \left(\frac{5}{16} \times 100 \right) \% = 31.25\%$$

Ans: 31.25%

9. If 20% of 90 is greater than 30% of a number by 6, find the number. [2]

Let the number be x .

$$20\% \text{ of } 90 = 30\% \text{ of } x + 6$$

$$\Rightarrow 18 = \frac{30x}{100} + 6$$

$$\Rightarrow 18 - 6 = \frac{30x}{100} \Rightarrow x = \frac{12 \times 100}{30} = 40$$

Ans: 40

10. (i) By what percent is 63 more than 56? (ii) By what percent is 56 less than 63? [3]

$$(i) \left[\frac{\text{Greater} - \text{smaller}}{\text{smaller}} \times 100 \right] \%$$

$$= \left(\frac{63 - 56}{56} \times 100 \right) \% = \left(\frac{7}{56} \times 100 \right) \% = 12.5\%$$

$$(ii) \left[\frac{\text{Greater} - \text{smaller}}{\text{Greater}} \times 100 \right] \%$$

$$= \left(\frac{7}{63} \times 100 \right) \% = 11\frac{1}{9}\%$$

Ans: (i) 12.5% (ii) $11\frac{1}{9}\%$

11. The price of sugar falls by 20%. By how much percent can a family increase its consumption without increasing its expenditure? [2]

$$\text{Increase in consumption} = \left[\frac{R}{100 - R} \times 100 \right] \%$$

$$= \left(\frac{20}{80} \times 100 \right) \% = 25\%$$

Ans: 25%

12. By selling a refrigerator for ₹21,600, a dealer suffers a loss of 10%. What is the cost price of the refrigerator? At what price should he sell it to gain 15%? [5]

$$\text{C.P} = \frac{100}{100 - \text{Loss}\%} \times \text{S.P}$$

$$= \frac{100}{90} \times 21,600 = 24,000$$

$$\text{For a gain of } 15\%: \text{S.P} = \frac{100 + \text{Profit}\%}{100} \times \text{C.P}$$

$$= \frac{115}{100} \times 24,000 = 27,600$$

Ans: C.P ₹24,000; S.P ₹27,600

13. An article is marked at ₹1500. The shopkeeper gives a discount of ₹150 and still makes a profit of ₹270. Find the cost price. [3]

$$\text{When a profit is made, C.P} = \text{M.P} - \text{Discount} - \text{Profit}$$

$$\text{C.P} = 1500 - 150 - 270 = 1080$$

Ans: ₹1080

14. A shopkeeper says he sells dal at cost price, but he gives only 800 g for every kg. Find his gain percent. [2]

$$\text{Gain \%} = \left(\frac{\text{Error}}{\text{True value} - \text{Error}} \times 100 \right) \%$$

$$\text{Error} = 1000 - 800 = 200 \text{ g}$$

$$\text{Gain \%} = \left(\frac{200}{1000 - 200} \times 100 \right) \% = \left(\frac{200}{800} \times 100 \right) \% = 25\%$$

Ans: 25%

15. Find the average of 125, 140, 155, 180, 200. [1]

$$\begin{aligned} \text{Average} &= \frac{\text{Sum of observations}}{\text{No. of observations}} \\ &= \frac{125 + 140 + 155 + 180 + 200}{5} = \frac{800}{5} = 160 \end{aligned}$$

Ans: 160

16. The average runs of a cricket player in 12 innings is 40. How many runs must he make in the next innings to increase his average by 3? [5]

$$x_1 + \dots + x_{12} = 40(12) = 480 \quad (1)$$

$$\frac{x_1 + \dots + x_{12} + x_{13}}{13} = 40 + 3 = 43$$

$$480 + x_{13} = 43(13) = 559$$

$$x_{13} = 559 - 480 = 79$$

Ans: 79 runs

17. Convert 126 km/h into m/s. [1]

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

$$126 \text{ km/h} = 126 \times \frac{5}{18} = 35 \text{ m/s}$$

Ans: 35 m/s

18. A car goes from A to B at 50 km/h and comes back from B to A at 75 km/h. Find the average speed of the car. [3]

$$\begin{aligned} \text{For equal distances at speeds } s_1 \text{ and } s_2: \text{ average speed} &= \frac{2s_1s_2}{s_1 + s_2} \\ &= \frac{2 \times 50 \times 75}{50 + 75} = \frac{7500}{125} = 60 \text{ km/h} \end{aligned}$$

Ans: 60 km/h

19. The simple interest on ₹1800 for 3 years is ₹270. Find the rate of interest. [2]

$$\text{S.I} = \frac{P \times T \times R}{100} \Rightarrow R = \frac{\text{S.I} \times 100}{P \times T}$$

$$R = \frac{270 \times 100}{1800 \times 3} = 5\%$$

Ans: 5% per annum

20. Find the amount and the compound interest on ₹12,500 for 2 years at 8% per annum, compounded annually. [5]

$$\begin{aligned} A &= P \left(1 + \frac{R}{100} \right)^n \\ &= 12,500 \left(1 + \frac{8}{100} \right)^2 = 12,500 \times \left(\frac{27}{25} \right)^2 \\ &= 14,580 \end{aligned}$$

$$\text{C.I} = A - P = 14,580 - 12,500 = 2080$$

Ans: Amount ₹14,580; C.I ₹2080
