

**Arithmetic (Level 1)****Question Paper, Set 07**

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 36 mm to 4 cm in its simplest form. [1 mark]
2. Divide ₹1980 between Meena and Latha in the ratio 5 : 7. [2 marks]
3. The monthly salaries of Divya and Hari are in the ratio 4 : 7. If the salary of each is increased by ₹2000, the new ratio becomes 14 : 23. Find the salary of each before the increase. [5 marks]
4. Are 5, 8, 15, 25 in proportion? Give a reason. [1 mark]
5. Find the mean proportional between 27 and 75. [2 marks]
6. If 6 kg of sugar costs ₹270, find the cost of 1 kg. [1 mark]
7. A person has money to buy 30 fans at ₹1200 each. How many fans can he buy if each fan costs ₹240 more? [3 marks]
8. Express the ratio 7 : 8 as a percentage. [1 mark]
9. Find the number which exceeds 25% of itself by 54. [2 marks]
10. A school had 1250 students. The number fell by 8%. How many students left the school, and how many are there now? [3 marks]
11. If Geetha's weight is 25% less than Rani's, by what percent is Rani's weight more than Geetha's? [2 marks]
12. Asha buys a certain number of oranges at 10 for ₹15 and the same number at 15 for ₹15. If she sells them all at 8 for ₹12, does she gain or lose, and by what percentage? [5 marks]
13. A bag marked at ₹800 is sold for ₹680. Find the discount percentage. [3 marks]
14. A shopkeeper says he sells oil at cost price, but he gives only 950 ml for every litre. Find his gain percent. [2 marks]
15. Find the average of 3.5, 4.2, 5.8, 6.5. [1 mark]

- 16.** The average weight of 10 persons increases by 1.5 kg when a new person comes in place of one of them weighing 58 kg. Find the weight of the new person. [5 marks]
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- 17.** Convert 12 m/s into km/h. [1 mark]
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- 18.** A man travels 150 km in 3 hours and then 90 km in 2 hours. Find his average speed for the whole journey. [3 marks]
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- 19.** Find the simple interest on ₹840 at 5% per annum for 9 months. [2 marks]
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- 20.** The population of a town was 2,00,000 three years ago. It increased by 5%, 4% and 2.5% in the last three years. Find the present population. [5 marks]
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## Key sheet

| Q  | Answer                        |
|----|-------------------------------|
| 1  | 9 : 10                        |
| 2  | ₹825 and ₹1155                |
| 3  | Divya: ₹12,000, Hari: ₹21,000 |
| 4  | No                            |
| 5  | 45                            |
| 6  | ₹45                           |
| 7  | 25 fans                       |
| 8  | 87.5%                         |
| 9  | 72                            |
| 10 | 100 left; 1150 now            |
| 11 | $33\frac{1}{3}\%$             |
| 12 | Gain of 20%                   |
| 13 | 15%                           |
| 14 | $5\frac{5}{19}\%$             |
| 15 | 5                             |
| 16 | 73 kg                         |
| 17 | 43.2 km/h                     |
| 18 | 48 km/h                       |
| 19 | ₹31.5                         |
| 20 | 2,23,860                      |

## Solutions

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1. Find the ratio of 36 mm to 4 cm in its simplest form. [1]

$$4 \text{ cm} = 4 \times 10 \text{ mm} = 40 \text{ mm}$$

$$\frac{36 \text{ mm}}{40 \text{ mm}} = \frac{36}{40} = \frac{9}{10}$$

$$\text{Ratio} = 9 : 10$$

**Ans: 9 : 10**

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2. Divide ₹1980 between Meena and Latha in the ratio 5 : 7. [2]

$$\text{Sum of the terms of the ratio} = 5 + 7 = 12$$

$$\text{First part} = \frac{5}{12} \times 1980 = 825$$

$$\text{Second part} = \frac{7}{12} \times 1980 = 1155$$

**Ans: ₹825 and ₹1155**

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3. The monthly salaries of Divya and Hari are in the ratio 4 : 7. If the salary of each is increased by ₹2000, the new ratio becomes 14 : 23. Find the salary of each before the increase. [5]

Let Divya's old salary =  $4k$  and Hari's old salary =  $7k$ .

$$\frac{4k+2000}{7k+2000} = \frac{14}{23}$$

$$\Rightarrow (4k + 2000)23 = (7k + 2000)14$$

$$\Rightarrow 92k + 46,000 = 98k + 28,000$$

$$\Rightarrow 46,000 - 28,000 = 98k - 92k$$

$$\Rightarrow 18,000 = 6k \Rightarrow k = 3000$$

$$\text{Old salaries: Divya} = 4k = 12,000, \text{ Hari} = 7k = 21,000$$

**Ans: Divya: ₹12,000, Hari: ₹21,000**

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4. Are 5, 8, 15, 25 in proportion? Give a reason. [1]

$$\text{Product of extremes} = 5 \times 25 = 125$$

$$\text{Product of means} = 8 \times 15 = 120$$

They are not equal, so the numbers are not in proportion. No.

**Ans: No**

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5. Find the mean proportional between 27 and 75. [2]

$$\text{Mean proportional} = \sqrt{27 \times 75}$$

$$= \sqrt{(9 \times 3) \times (3 \times 25)}$$

$$= \sqrt{9 \times 9 \times 25} = 3 \times 3 \times 5 = 45$$

**Ans: 45**

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6. If 6 kg of sugar costs ₹270, find the cost of 1 kg. [1]

$$6 \text{ kg} \rightarrow ₹270$$

$$1 \text{ kg} \rightarrow ₹\frac{270}{6} = 45$$

**Ans: ₹45**

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7. A person has money to buy 30 fans at ₹1200 each. How many fans can he buy if each fan costs ₹240 more? [3]

$$\text{New cost of a fan} = 1200 + 240 = 1440$$

Cost of a fan (₹) | Fans

$$1200 \mid 30$$

$$1440 \mid y$$

Inverse proportion:  $x_1y_1 = x_2y_2$

$$1440 \times y = 1200 \times 30 \Rightarrow y = \frac{1200 \times 30}{1440} = 25$$

**Ans: 25 fans**

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8. Express the ratio 7 : 8 as a percentage. [1]

$$7 : 8 = \frac{7}{8}$$

$$\frac{7}{8} = \left(\frac{7}{8} \times 100\right) \% = 87.5\%$$

**Ans: 87.5%**

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9. Find the number which exceeds 25% of itself by 54. [2]

Let the number be  $x$ .

$$x = \frac{25}{100}x + 54$$

$$\Rightarrow \frac{100x - 25x}{100} = 54$$

$$\Rightarrow \frac{75x}{100} = 54 \Rightarrow x = \frac{54 \times 100}{75} = 72$$

**Ans: 72**

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10. A school had 1250 students. The number fell by 8%. How many students left the school, and how many are there now? [3]

$$\text{Decrease} = 8\% \text{ of } 1250 = \frac{8}{100} \times 1250 = 100$$

$$\text{Students now} = \frac{100-8}{100} \times 1250 = 1150$$

**Ans: 100 left; 1150 now**

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11. If Geetha's weight is 25% less than Rani's, by what percent is Rani's weight more than Geetha's? [2]

If  $A$  is  $R\%$  less than  $B$ , then  $B$  is more than  $A$  by  $\left[\frac{R}{100-R} \times 100\right] \%$

$$= \left(\frac{25}{100-25} \times 100\right) \% = \left(\frac{25}{75} \times 100\right) \% = 33\frac{1}{3}\%$$

**Ans:  $33\frac{1}{3}\%$**

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12. Asha buys a certain number of oranges at 10 for ₹15 and the same number at 15 for ₹15. If she sells them all at 8 for ₹12, does she gain or lose, and by what percentage? [5]

Let her buy  $x$  oranges at each price,  $2x$  in all.

$$\text{C.P of } x \text{ at } 10 \text{ for } 15 = \frac{15x}{10} = \frac{3}{2}x$$

$$\text{C.P of } x \text{ at } 15 \text{ for } 15 = \frac{15x}{15} = x$$

$$\text{Total C.P} = \frac{3}{2}x + x = \frac{5}{2}x$$

$$\text{S.P of } 2x = 2x \times \frac{12}{8} = 3x$$

$$\text{Gain \%} = \frac{3x - \frac{5}{2}x}{\frac{5}{2}x} \times 100 = 20\%$$

**Ans: Gain of 20%**

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**13.** A bag marked at ₹800 is sold for ₹680. Find the discount percentage. [3]

$$\text{Discount} = \text{M.P} - \text{S.P} = 800 - 680 = 120$$

$$\text{Discount \%} = \left( \frac{120}{800} \times 100 \right) \% = 15\%$$

**Ans:** 15%

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**14.** A shopkeeper says he sells oil at cost price, but he gives only 950 ml for every litre. Find his gain percent. [2]

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

$$\text{Error} = 1000 - 950 = 50 \text{ ml}$$

$$\text{Gain \%} = \left( \frac{50}{1000 - 50} \times 100 \right) \% = \left( \frac{50}{950} \times 100 \right) \% = 5\frac{5}{19} \%$$

**Ans:**  $5\frac{5}{19}\%$

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**15.** Find the average of 3.5, 4.2, 5.8, 6.5. [1]

$$\begin{aligned} \text{Average} &= \frac{\text{Sum of observations}}{\text{No. of observations}} \\ &= \frac{3.5 + 4.2 + 5.8 + 6.5}{4} = \frac{20}{4} = 5 \end{aligned}$$

**Ans:** 5

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**16.** The average weight of 10 persons increases by 1.5 kg when a new person comes in place of one of them weighing 58 kg. Find the weight of the new person. [5]

Let the average be  $P$  and the new person's weight  $N$ . Sum before =  $10P$ .

$$\frac{10P - 58 + N}{10} = P + 1.5$$

$$\Rightarrow 10P - 58 + N = 10P + 15$$

$$\Rightarrow N = 58 + 15 = 73 \text{ kg}$$

**Ans:** 73 kg

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**17.** Convert 12 m/s into km/h. [1]

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

$$12 \text{ m/s} = 12 \times \frac{18}{5} = 43.2 \text{ km/h}$$

**Ans:** 43.2 km/h

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**18.** A man travels 150 km in 3 hours and then 90 km in 2 hours. Find his average speed for the whole journey. [3]

$$\begin{aligned} \text{Average speed} &= \frac{\text{Total distance}}{\text{Total time}} \\ &= \frac{150 + 90}{3 + 2} = \frac{240}{5} = 48 \text{ km/h} \end{aligned}$$

**Ans:** 48 km/h

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**19.** Find the simple interest on ₹840 at 5% per annum for 9 months. [2]

$$T = 9 \text{ months} = \frac{9}{12} = \frac{3}{4} \text{ year}$$

$$\text{S.I} = \frac{P \times T \times R}{100} = \frac{840 \times \frac{3}{4} \times 5}{100} = 31.5$$

**Ans:** ₹31.5

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**20.** The population of a town was 2,00,000 three years ago. It increased by 5%, 4% and 2.5% in the last three years. Find the present population. [5]

$$\begin{aligned}A &= P \left(1 + \frac{R_1}{100}\right) \left(1 + \frac{R_2}{100}\right) \left(1 + \frac{R_3}{100}\right) \\&= 2,00,000 \left(1 + \frac{5}{100}\right) \left(1 + \frac{4}{100}\right) \left(1 + \frac{2.5}{100}\right) \\&= 2,00,000 \times \frac{21}{20} \times \frac{26}{25} \times \frac{41}{40} \\&= 2,23,860\end{aligned}$$

**Ans:** 2,23,860

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