

Arithmetic (Level 1)

MCQ Test, Set 03

Time: 30 minutes

Maximum marks: 25

Name: _____ Class: _____ Date: _____

1. There are 25 questions. Each has exactly one correct answer: choose A, B, C or D.
2. Each correct answer carries 1 mark. There is no negative marking.
3. The key sheet and worked solutions are at the end of this test.

1. Find the ratio of the price of coffee to that of tea, when coffee costs ₹45 per 100 g and tea costs ₹600 per kg.

A. 15 : 2 B. 3 : 4 C. 3 : 40 D. 4 : 3

2. If ₹1440 is divided into two parts in the ratio 7 : 9, then the smaller part is

A. ₹90 B. ₹630 C. ₹180 D. ₹810

3. The ratio of boys to girls in a school with 720 students is 7 : 5. If 30 more girls are admitted, the new ratio of boys to girls is

A. 7 : 6 B. 7 : 5 C. 3 : 2 D. 14 : 11

4. In the proportion $3 : 5 :: 12 : 20$, the means are

A. 3 and 20 B. 12 and 20 C. 5 and 12 D. 3 and 5

5. If 16, x , x , 25 are in proportion, then $x =$

A. 400 B. 20.5 C. 20 D. 9

6. If $a : b = c : d$, then $\frac{a+b}{a-b} = \frac{c+d}{c-d}$. This property is called

A. Dividendo B. Componendo
C. Addendo D. Componendo and dividendo

7. The cost of 8 m of cloth is ₹456. The cost of 5 m of the same cloth is (in ₹)

A. 285 B. 57 C. 729.6 D. 342

8. 12 pumps fill a tank in 45 minutes. If 3 pumps go out of order, the remaining pumps fill it in

A. 48 minutes B. 60 minutes C. 33.75 minutes D. 54 minutes

9. 0.07 expressed as a percentage is

A. 0.07% B. 0.7% C. 7% D. 70%

10. What percent of 6 is 9?

A. $66\frac{2}{3}\%$ B. 150% C. 54% D. 15%

11. By what percent is 72 more than 60?
A. 20% B. $16\frac{2}{3}\%$ C. 120% D. 12%
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12. The price of tea rises by 20%. To keep the expenditure the same, consumption must be reduced by
A. 20% B. 25% C. 10% D. $16\frac{2}{3}\%$
-
13. A population of 10000 increases at 10% per annum. After 3 years it will be
A. 13,310 B. 12,100 C. 13,000 D. 14,641
-
14. An agent gets 2% commission on his sales. If his commission is ₹350, the goods sold are worth
A. ₹1,75,000 B. ₹7000 C. ₹1750 D. ₹17,500
-
15. The cost price of an article is ₹480 and the markup is 35%. Its marked price is
A. ₹648 B. ₹312 C. ₹515 D. ₹168
-
16. Two chairs are sold at ₹1500 each, one at 25% profit and the other at 25% loss. On the whole there is a
A. loss of 2.5% B. neither profit nor loss
C. loss of 6.25% D. gain of 6.25%
-
17. If the cost price of 24 articles equals the selling price of 18 articles, then there is a
A. 25% loss B. $33\frac{1}{3}\%$ loss
C. $33\frac{1}{3}\%$ gain D. 25% gain
-
18. The average of 9 numbers is 42. The average of the first 4 is 40 and that of the last 4 is 45. The 5th number is
A. 42 B. 38 C. 45 D. 40
-
19. The average of $x_1, x_2, \dots, x_n$ is 12. The average of $2x_1 + 5, 2x_2 + 5, \dots, 2x_n + 5$ is
A. 24 B. 17 C. 34 D. 29
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20. If a man travels at 40 km/h, he reaches his destination 12 minutes late, and at 60 km/h he reaches 8 minutes early. The distance travelled is
A. 40 km B. 30 km C. 36 km D. 48 km
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21. A cyclist covers three equal distances at 20 km/h, 30 km/h and 60 km/h. His average speed is
A. 30 km/h B. $36\frac{2}{3}$ km/h C. 36 km/h D. 25 km/h
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22. The speeds of two trains are in the ratio 4 : 5. The first takes 10 hours for a journey. The second takes
A. 9 hours B. 11 hours C. 8 hours D. 12.5 hours
-
23. Two trains are moving in the same direction at 68 km/h and 50 km/h. Their relative speed is
A. 118 km/h B. 18 km/h C. 34 km/h D. 59 km/h
-

24. The simple interest on ₹1250 for 4 years is ₹300. The rate of interest per annum is

A. 24%

B. 1.5%

C. 8%

D. 6%

25. The amount on ₹8000 at 10% per annum for 1 year, compounded half-yearly, is

A. ₹8400

B. ₹8800

C. ₹9680

D. ₹8820

Key sheet

1. B	2. B	3. D	4. C	5. C
6. D	7. A	8. B	9. C	10. B
11. A	12. D	13. A	14. D	15. A
16. C	17. C	18. B	19. D	20. A
21. A	22. C	23. B	24. D	25. D

Solutions

1. Find the ratio of the price of coffee to that of tea, when coffee costs ₹45 per 100 g and tea costs ₹600 per kg.

100 g of coffee costs ₹45, so 1000 g (1 kg) costs ₹450.

$$\text{Required ratio} = \frac{450}{600} = \frac{3}{4} = 3 : 4$$

Ans: (B) 3 : 4

2. If ₹1440 is divided into two parts in the ratio 7 : 9, then the smaller part is

$$\text{Smaller part} = \frac{7}{7+9} \times 1440 = \frac{7}{16} \times 1440 = 630$$

Ans: (B) ₹630

3. The ratio of boys to girls in a school with 720 students is 7 : 5. If 30 more girls are admitted, the new ratio of boys to girls is

$$\text{Boys} = \frac{7}{12} \times 720 = 420, \quad \text{Girls} = 720 - 420 = 300$$

$$\text{New ratio} = \frac{420}{330} = 14 : 11$$

Ans: (D) 14 : 11

4. In the proportion 3 : 5 :: 12 : 20, the means are

In $a : b :: c : d$, the second and third terms are the means.

So the means are 5 and 12 (and $5 \times 12 = 60 = 3 \times 20$).

Ans: (C) 5 and 12

5. If 16, x , x , 25 are in proportion, then $x =$

$$\frac{16}{x} = \frac{x}{25} \Rightarrow x^2 = 400 \Rightarrow x = 20$$

Ans: (C) 20

6. If $a : b = c : d$, then $\frac{a+b}{a-b} = \frac{c+d}{c-d}$. This property is called

Adding (componendo) and subtracting (dividendo) together gives $\frac{a+b}{a-b} = \frac{c+d}{c-d}$: componendo and dividendo.

Ans: (D) Componendo and dividendo

7. The cost of 8 m of cloth is ₹456. The cost of 5 m of the same cloth is (in ₹)

$$\text{Direct proportion: } x_1 y_2 = x_2 y_1$$

$$y = \frac{5 \times 456}{8} = 285$$

Ans: (A) 285

8. 12 pumps fill a tank in 45 minutes. If 3 pumps go out of order, the remaining pumps fill it in

$$\text{Inverse proportion: } x_1 y_1 = x_2 y_2$$

$$12 \times 45 = 9 \times y \Rightarrow y = 60$$

Ans: (B) 60 minutes

9. 0.07 expressed as a percentage is

$$0.07 = (0.07 \times 100)\% = 7\%$$

Ans: (C) 7%

10. What percent of 6 is 9?

$$\left(\frac{9}{6} \times 100\right)\% = 150\%$$

Ans: (B) 150%

11. By what percent is 72 more than 60?

$$\text{Change} = 12$$

$$\left(\frac{12}{60} \times 100\right)\% = 20\%$$

Always divide by the original value.

Ans: (A) 20%

12. The price of tea rises by 20%. To keep the expenditure the same, consumption must be reduced by

$$\left(\frac{20}{100+20} \times 100\right)\% = \left(\frac{20}{120} \times 100\right)\% = 16\frac{2}{3}\%$$

Ans: (D) $16\frac{2}{3}\%$

13. A population of 10000 increases at 10% per annum. After 3 years it will be

$$10000 \left(\frac{11}{10}\right)^3 = 13310$$

Ans: (A) 13,310

14. An agent gets 2% commission on his sales. If his commission is ₹350, the goods sold are worth

$$\frac{2}{100}x = 350 \Rightarrow x = \frac{350 \times 100}{2} = 17500$$

Ans: (D) ₹17,500

15. The cost price of an article is ₹480 and the markup is 35%. Its marked price is

$$\text{M.P} = 480 + \frac{35}{100} \times 480 = 480 + 168 = 648$$

Ans: (A) ₹648

16. Two chairs are sold at ₹1500 each, one at 25% profit and the other at 25% loss. On the whole there is a

Same S.P, $a\%$ profit and $a\%$ loss: always a loss of $\left(\frac{a}{10}\right)^2\%$.

$$\left(\frac{25}{10}\right)^2 = 6.25\%$$

Ans: (C) loss of 6.25%

17. If the cost price of 24 articles equals the selling price of 18 articles, then there is a

$$24x = 18y \Rightarrow \frac{y}{x} = \frac{4}{3}$$

$$\left(\frac{y}{x} - 1\right) \times 100 = 33\frac{1}{3}\% \text{ (a gain)}$$

Ans: (C) $33\frac{1}{3}\%$ gain

18. The average of 9 numbers is 42. The average of the first 4 is 40 and that of the last 4 is 45. The 5th number is

$$\text{Sum of 9} = 378, \text{ first 4} = 160, \text{ last 4} = 180$$

$$x_5 = 378 - 160 - 180 = 38$$

Ans: (B) 38

19. The average of $x_1, x_2, \dots, x_n$ is 12. The average of $2x_1 + 5, 2x_2 + 5, \dots, 2x_n + 5$ is

$$\text{Average of } ax_i + b \text{ is } a\bar{x} + b = 2(12) + 5 = 29$$

Ans: (D) 29

20. If a man travels at 40 km/h, he reaches his destination 12 minutes late, and at 60 km/h he reaches 8 minutes early. The distance travelled is

$$\text{Let } T \text{ be the correct time (hours): } D = 40 \left(T + \frac{12}{60}\right) = 60 \left(T - \frac{8}{60}\right)$$

$$\Rightarrow T = \frac{4}{5} \text{ h, } D = 40 \times 1 = 40 \text{ km}$$

Ans: (A) 40 km

21. A cyclist covers three equal distances at 20 km/h, 30 km/h and 60 km/h. His average speed is

$$\frac{3 \times 20 \times 30 \times 60}{600 + 1800 + 1200} = \frac{1,08,000}{3600} = 30$$

Ans: (A) 30 km/h

22. The speeds of two trains are in the ratio 4 : 5. The first takes 10 hours for a journey. The second takes

$$s_1 : s_2 = T_2 : T_1 \Rightarrow 4 : 5 = T_2 : 10$$

$$T_2 = \frac{4 \times 10}{5} = 8 \text{ hours}$$

Ans: (C) 8 hours

23. Two trains are moving in the same direction at 68 km/h and 50 km/h. Their relative speed is

$$\text{Same direction: relative speed} = (x - y) = 68 - 50 = 18 \text{ km/h}$$

Ans: (B) 18 km/h

24. The simple interest on ₹1250 for 4 years is ₹300. The rate of interest per annum is

$$R = \frac{300 \times 100}{1250 \times 4} = 6\%$$

Ans: (D) 6%

25. The amount on ₹8000 at 10% per annum for 1 year, compounded half-yearly, is

$$k = 2: A = 8000 \left(1 + \frac{10}{200}\right)^2 = 8000 \times \frac{21}{20} \times \frac{21}{20} = 8820$$

Ans: (D) ₹8820
