

Arithmetic (Level 1)

MCQ Test, Set 05

Time: 30 minutes

Maximum marks: 25

Name: _____ Class: _____ Date: _____

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

- A school team played 36 matches and won 20 of them. The ratio of the number of matches played to the number of matches lost is
A. 9 : 5 **B.** 9 : 4 **C.** 5 : 4 **D.** 4 : 9
- If ₹2100 is divided into two parts in the ratio 3 : 11, then the larger part is
A. ₹1650 **B.** ₹1200 **C.** ₹450 **D.** ₹150
- Three numbers are in the ratio 1 : 2 : 3 and the sum of their squares is 224. The sum of the numbers is
A. 12 **B.** 96 **C.** 16 **D.** 24
- The fourth proportional to 5, 12 and 15 is
A. 4 **B.** 36 **C.** 6.25 **D.** 22
- If a, b, c are in continued proportion, then
A. $a^2 = bc$ **B.** $b = ac$ **C.** $b^2 = ac$ **D.** $c^2 = ab$
- If $a : b = 8 : 5$, then $\frac{a+b}{a-b} =$
A. $\frac{13}{5}$ **B.** $\frac{8}{5}$ **C.** $\frac{3}{13}$ **D.** $\frac{13}{3}$
- A photograph of a bacterium enlarged 40,000 times has a length of 6 cm. The actual length of the bacterium is
A. 1.5×10^{-3} cm **B.** 1.5×10^{-4} cm **C.** 2.4×10^5 cm **D.** 1.5×10^{-5} cm
- A varies directly as B and inversely as C . If $A = 8$ when $B = 12$ and $C = 3$, then A when $B = 15$ and $C = 5$ is
A. 6 **B.** 1.5 **C.** 4.8 **D.** 10
- $\frac{5}{12}$ expressed as a percentage is
A. $4\frac{1}{6}\%$ **B.** 2.4% **C.** 60% **D.** $41\frac{2}{3}\%$
- The number which exceeds 40% of itself by 36 is
A. 90 **B.** 50.4 **C.** 72 **D.** 60

11. A sum of ₹2500 is decreased by 18%. The new amount is
A. ₹2050 **B.** ₹2950 **C.** ₹450 **D.** ₹2482
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12. If A 's income is 60% more than B 's, then B 's income is less than A 's by
A. 60% **B.** 62.5% **C.** 37.5% **D.** 40%
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13. If the present population P increases at $R\%$ per annum, the population n years ago was
A. $\frac{P}{1 + \frac{nR}{100}}$ **B.** $\frac{P}{\left(1 + \frac{R}{100}\right)^n}$
C. $P \left(1 + \frac{R}{100}\right)^n$ **D.** $P \left(1 - \frac{R}{100}\right)^n$
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14. By selling a table for ₹1105, a man loses 15%. The cost price of the table is
A. ₹1270.75 **B.** ₹1120 **C.** ₹1300 **D.** ₹939.25
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15. An article marked at ₹2000 is sold with a discount of ₹300 at a profit of ₹200. Its cost price is
A. ₹1900 **B.** ₹1500 **C.** ₹2100 **D.** ₹1700
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16. Two fans are sold at ₹1232 each, one at 12% profit and the other at 12% loss. On the whole there is a
A. neither profit nor loss **B.** gain of 1.44%
C. loss of 1.44% **D.** loss of 1.2%
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17. A shopkeeper buys pens at 20 for ₹90 and sells them at 15 for ₹81. His profit percent is
A. 25% **B.** 20% **C.** 10% **D.** $16\frac{2}{3}\%$
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18. A library has an average of 540 visitors on Sundays and 270 on other days. The average number of visitors per day in a month of 30 days beginning with a Sunday is
A. 300 **B.** 405 **C.** 315 **D.** 306
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19. A batsman scores 92 runs in his 21st innings and thus increases his average by 3. His average after the 21st innings is
A. 29 **B.** 95 **C.** 32 **D.** 35
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20. A train covers 315 km at 70 km/h. The time taken is
A. 4 h 5 min **B.** 4 h 30 min **C.** 5 h 15 min **D.** 4 h 50 min
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21. A man travels 120 km in 2 hours and then 80 km in 3 hours. His average speed is
A. 40 km/h **B.** 36 km/h **C.** $43\frac{1}{3}$ km/h **D.** 50 km/h
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22. Walking at 4 km/h, a boy reaches school in 45 minutes. Walking at 5 km/h, he will reach in
A. 36 minutes **B.** 40 minutes **C.** 30 minutes **D.** 56.25 minutes
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23. Two trains are moving in opposite directions at 45 km/h and 35 km/h. Their relative speed is
A. 40 km/h **B.** 10 km/h **C.** 5 km/h **D.** 80 km/h
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24. A sum gives ₹450 as simple interest in 3 years at 5% per annum. The sum is
- A. ₹67.5 B. ₹9000 C. ₹2700 D. ₹3000
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25. A sum of ₹1000 becomes ₹1440 in 2 years at compound interest. The rate of interest per annum is
- A. 20% B. 44% C. 22% D. 12%
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Key sheet

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

Solutions

1. A school team played 36 matches and won 20 of them. The ratio of the number of matches played to the number of matches lost is

$$\text{Matches lost} = 36 - 20 = 16$$

$$\text{Required ratio} = \frac{36}{16} = \frac{9}{4} = 9 : 4$$

Ans: (B) 9 : 4

2. If ₹2100 is divided into two parts in the ratio 3 : 11, then the larger part is

$$\text{Larger part} = \frac{11}{3+11} \times 2100 = \frac{11}{14} \times 2100 = 1650$$

Ans: (A) ₹1650

3. Three numbers are in the ratio 1 : 2 : 3 and the sum of their squares is 224. The sum of the numbers is

$$\text{Numbers: } 1k, 2k, 3k; 14k^2 = 224 \Rightarrow k^2 = 16 \Rightarrow k = 4$$

$$\text{Sum} = 6k = 24$$

Ans: (D) 24

4. The fourth proportional to 5, 12 and 15 is

$$5 : 12 :: 15 : x \Rightarrow 5x = 12 \times 15$$

$$x = \frac{180}{5} = 36$$

Ans: (B) 36

5. If a, b, c are in continued proportion, then

$a : b :: b : c$, so product of means = product of extremes.

$$b \times b = a \times c, \text{ i.e. } b^2 = ac.$$

Ans: (C) $b^2 = ac$

6. If $a : b = 8 : 5$, then $\frac{a+b}{a-b} =$

By componendo and dividendo:

$$\frac{a+b}{a-b} = \frac{8+5}{8-5} = \frac{13}{3}$$

Ans: (D) $\frac{13}{3}$

7. A photograph of a bacterium enlarged 40,000 times has a length of 6 cm. The actual length of the bacterium is

$$\text{Enlarged 40,000 times} \rightarrow 6 \text{ cm, so 1 time} \rightarrow \frac{6}{40000} \text{ cm.}$$

$$\frac{6}{40000} = 0.00015 = 1.5 \times 10^{-4} \text{ cm}$$

Ans: (B) 1.5×10^{-4} cm

8. A varies directly as B and inversely as C . If $A = 8$ when $B = 12$ and $C = 3$, then A when $B = 15$ and $C = 5$ is

$$A = \frac{kB}{C}: 8 = \frac{12k}{3} \Rightarrow k = 2$$

$$A = \frac{2 \times 15}{5} = 6$$

Ans: (A) 6

9. $\frac{5}{12}$ expressed as a percentage is

$$\frac{5}{12} = \frac{500}{12}\% = 41\frac{2}{3}\% \approx 41.67\%$$

Ans: (D) $41\frac{2}{3}\%$

10. The number which exceeds 40% of itself by 36 is

$$x - \frac{40}{100}x = 36 \Rightarrow \frac{60x}{100} = 36$$

$$x = \frac{36 \times 100}{60} = 60$$

Ans: (D) 60

11. A sum of ₹2500 is decreased by 18%. The new amount is

$$\frac{100-18}{100} \times 2500 = 2050$$

Ans: (A) ₹2050

12. If A's income is 60% more than B's, then B's income is less than A's by

$$\left(\frac{60}{160} \times 100\right)\% = 37.5\%$$

Ans: (C) 37.5%

13. If the present population P increases at $R\%$ per annum, the population n years ago was

$$\text{If } x \text{ was the population } n \text{ years ago, } x \left(1 + \frac{R}{100}\right)^n = P, \text{ so } x = \frac{P}{\left(1 + \frac{R}{100}\right)^n}.$$

Ans: (B) $\frac{P}{\left(1 + \frac{R}{100}\right)^n}$

14. By selling a table for ₹1105, a man loses 15%. The cost price of the table is

$$\text{C.P} = \frac{100}{100-15} \times 1105 = \frac{100}{85} \times 1105 = 1300$$

Ans: (C) ₹1300

15. An article marked at ₹2000 is sold with a discount of ₹300 at a profit of ₹200. Its cost price is

$$\text{C.P} = \text{M.P} - \text{Discount} - \text{Profit} = 2000 - 300 - 200 = 1500$$

Ans: (B) ₹1500

16. Two fans are sold at ₹1232 each, one at 12% profit and the other at 12% loss. On the whole there is a

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

$$\left(\frac{12}{10}\right)^2 = 1.44\%$$

Ans: (C) loss of 1.44%

17. A shopkeeper buys pens at 20 for ₹90 and sells them at 15 for ₹81. His profit percent is

$$\text{C.P of one} = \frac{9}{2}, \quad \text{S.P of one} = \frac{27}{5}$$

$$\text{Profit \%} = \frac{\frac{27}{5} - \frac{9}{2}}{\frac{9}{2}} \times 100 = 20\%$$

Ans: (B) 20%

18. A library has an average of 540 visitors on Sundays and 270 on other days. The average number of visitors per day in a month of 30 days beginning with a Sunday is

A 30-day month beginning with Sunday has 5 Sundays and 25 other days.

$$\frac{5(540)+25(270)}{30} = \frac{2700+6750}{30} = 315$$

Ans: (C) 315

19. A batsman scores 92 runs in his 21st innings and thus increases his average by 3. His average after the 21st innings is

$$\frac{20P+92}{21} = P + 3 \Rightarrow 20P + 92 = 21P + 63 \Rightarrow P = 29$$

$$\text{New average} = 29 + 3 = 32$$

Ans: (C) 32

20. A train covers 315 km at 70 km/h. The time taken is

$$T = \frac{315}{70} = 4.5 \text{ h} = 4 \text{ h } 30 \text{ min}$$

Ans: (B) 4 h 30 min

21. A man travels 120 km in 2 hours and then 80 km in 3 hours. His average speed is

$$\text{Average speed} = \frac{120+80}{2+3} = \frac{200}{5} = 40 \text{ km/h}$$

Ans: (A) 40 km/h

22. Walking at 4 km/h, a boy reaches school in 45 minutes. Walking at 5 km/h, he will reach in

$$T_2 = \frac{4 \times 45}{5} = 36 \text{ minutes}$$

Ans: (A) 36 minutes

23. Two trains are moving in opposite directions at 45 km/h and 35 km/h. Their relative speed is

$$\text{Opposite directions: relative speed} = (x + y) = 45 + 35 = 80 \text{ km/h}$$

Ans: (D) 80 km/h

24. A sum gives ₹450 as simple interest in 3 years at 5% per annum. The sum is

$$P = \frac{450 \times 100}{3 \times 5} = 3000$$

Ans: (D) ₹3000

25. A sum of ₹1000 becomes ₹1440 in 2 years at compound interest. The rate of interest per annum is

$$\left(1 + \frac{R}{100}\right)^2 = \frac{1440}{1000} = \frac{144}{100} = \left(\frac{12}{10}\right)^2$$

$$1 + \frac{R}{100} = \frac{6}{5} \Rightarrow R = 20\%$$

Ans: (A) 20%
