EXPRESSWALA ACADEMY

Arithmetic (Level 1)

MCQ Test, Set 07

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. A box contains 60 bulbs, out of which 24 are defective. If the ratio of defective bulbs to good bulbs is $x : y$ in simplest form, then $x + y =$

A. 8 **B.** 5 **C.** 60 **D.** 7

2. If ₹1680 is divided into two parts in the ratio $5 : 9$, then the smaller part is

A. ₹600 **B.** ₹1080 **C.** ₹480 **D.** ₹120

3. In a school library, the ratio of comic books to story books is the same as the ratio of story books to Hindi books. If there are 360 story books and 240 Hindi books, then the number of comic books is

A. 540 **B.** 480 **C.** 240 **D.** 600

4. Which of the following are in proportion?

A. $3, 5, 9, 25$ **B.** $2, 5, 4, 8$ **C.** $3, 5, 9, 15$ **D.** $4, 6, 9, 12$

5. The mean proportional between 20 and 45 is

A. 32.5 **B.** 30 **C.** 900 **D.** 25

6. If $\frac{p}{q} = \frac{13}{8}$, then $\frac{p-q}{q} =$

A. $\frac{13}{8}$ **B.** $\frac{5}{13}$ **C.** $\frac{21}{8}$ **D.** $\frac{5}{8}$

7. x and y are in direct proportion. If $y = 15$ when $x = 6$, then y when $x = 10$ is

A. 9 **B.** 25 **C.** 19 **D.** 4

8. If x varies inversely as y and $x = 18$ when $y = 5$, then x when $y = 15$ is

A. 8 **B.** 54 **C.** 90 **D.** 6

9. 85% expressed as a decimal is

A. 8.5 **B.** 0.085 **C.** 0.85 **D.** 85

10. In an election between two candidates, one got 65% of the valid votes and 25% of the votes were invalid. If the total number of votes was 6400, the number of valid votes the other candidate got is

A. 1600 **B.** 3120 **C.** 2240 **D.** 1680

11. By what percent is 45 less than 54?

A. $16\frac{2}{3}\%$ **B.** $83\frac{1}{3}\%$ **C.** 9% **D.** 20%

12. X's weight is 30% less than Y's. Then Y's weight is more than X's by

A. $23\frac{1}{13}\%$ **B.** $42\frac{6}{7}\%$ **C.** 70% **D.** 30%

13. The present population of a city is 36300. It has been increasing at 10% per annum. Its population 2 years ago was

A. $29{,}403$ **B.** $29{,}040$ **C.** $33{,}000$ **D.** $30{,}000$

14. An article costs ₹2000. To gain 12%, it must be sold for

A. ₹1760 **B.** ₹2240 **C.** ₹2012 **D.** ₹240

15. If a discount of $D\%$ is given on the marked price, the selling price is

A. $\frac{100+D}{100} \times \text{M.P}$ **B.** $\frac{100-D}{100} \times \text{M.P}$

C. $\frac{100}{100-D} \times \text{M.P}$ **D.** $\frac{D}{100} \times \text{M.P}$

16. Two phones are sold at ₹1820 each, one at 30% profit and the other at 30% loss. On the whole there is a

A. loss of 9% **B.** loss of 3%

C. gain of 9% **D.** neither profit nor loss

17. If the cost price of 30 articles equals the selling price of 25 articles, then there is a

A. 20% loss **B.** 5% gain

C. 20% gain **D.** $16\frac{2}{3}\%$ gain

18. The sum of five numbers is 640. The average of the first two is 110 and the third number is 150. The average of the last two numbers is

A. 128 **B.** 270 **C.** 160 **D.** 135

19. The average of a batsman in 15 innings is 36. To raise his average by 2, the runs he must score in the 16th innings are

A. 70 **B.** 66 **C.** 68 **D.** 38

20. A train leaves at 8.50 am at 60 km/h. It covers 210 km at

A. 12.20 pm **B.** 11.55 am **C.** 11.50 am **D.** 12.40 pm

21. A man goes to a place at 24 km/h and returns by the same route at 40 km/h. His average speed for the whole journey is

A. 28 km/h **B.** 32 km/h **C.** 30 km/h **D.** 64 km/h

22. The speeds of two runners are 25 km/h and 35 km/h. The ratio of the times they take for the same distance is

A. $5:7$ **B.** $7:5$ **C.** $7:12$ **D.** $12:7$

23. When a train crosses a bridge, the distance it covers is

A. length of the bridge − length of the train

B. length of the train only

C. length of the train + length of the bridge

D. length of the bridge only

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24. A sum amounts to ₹960 in 3 years and to ₹1040 in 5 years at simple interest. The sum is

A. ₹760 **B.** ₹880 **C.** ₹800 **D.** ₹840

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25. The population of a town is 50000. It increases by 2% in the first year and by 4% in the second. The population after 2 years is

A. $53{,}040$ **B.** $54{,}080$ **C.** $52{,}000$ **D.** $53{,}000$

Key sheet

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

Solutions

1. A box contains 60 bulbs, out of which 24 are defective. If the ratio of defective bulbs to good bulbs is $x : y$ in simplest form, then $x + y =$

$\text{Good bulbs} = 60 - 24 = 36$

$\frac{\text{Defective}}{\text{Good}} = \frac{24}{36} = \frac{2}{3} \Rightarrow x : y = 2 : 3$

$x + y = 2 + 3 = 5$

Ans: (B) 5

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2. If ₹1680 is divided into two parts in the ratio $5 : 9$, then the smaller part is

$\text{Smaller part} = \frac{5}{5+9} \times 1680 = \frac{5}{14} \times 1680 = 600$

Ans: (A) ₹600

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3. In a school library, the ratio of comic books to story books is the same as the ratio of story books to Hindi books. If there are 360 story books and 240 Hindi books, then the number of comic books is

$\frac{\text{Comic}}{\text{Story}} = \frac{\text{Story}}{\text{Hindi}} = \frac{360}{240} = \frac{3}{2}$

$\text{Comic books} = 360 \times \frac{3}{2} = 540$

Ans: (A) 540

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4. Which of the following are in proportion?

a, b, c, d are in proportion when $ad = bc$.

$3 \times 15 = 45$ and $5 \times 9 = 45$, so $3, 5, 9, 15$ are in proportion.

Ans: (C) $3, 5, 9, 15$

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5. The mean proportional between 20 and 45 is

$\text{Mean proportional} = \sqrt{20 \times 45} = \sqrt{900} = 30$

Ans: (B) 30

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6. If $\frac{p}{q} = \frac{13}{8}$, then $\frac{p-q}{q} =$

By dividendo, $\frac{p-q}{q} = \frac{13-8}{8} = \frac{5}{8}$

Ans: (D) $\frac{5}{8}$

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7. x and y are in direct proportion. If $y = 15$ when $x = 6$, then y when $x = 10$ is

Direct proportion: $x_1 y_2 = x_2 y_1$

$y = \frac{10 \times 15}{6} = 25$

Ans: (B) 25

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8. If x varies inversely as y and $x = 18$ when $y = 5$, then x when $y = 15$ is

Inverse proportion: $x_1 y_1 = x_2 y_2$

$5 \times 18 = 15 \times y \Rightarrow y = 6$

Ans: (D) 6

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9. 85% expressed as a decimal is

$85\% = \frac{85}{100} = 0.85$

Ans: (C) 0.85

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10. In an election between two candidates, one got 65% of the valid votes and 25% of the votes were invalid. If the total number of votes was 6400, the number of valid votes the other candidate got is

$\text{Valid votes} = 75\% \text{ of } 6400 = 4800$

$\text{Other candidate} = 35\% \text{ of } 4800 = 1680$

Ans: (D) 1680

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11. By what percent is 45 less than 54?

$\left[\frac{\text{Greater}-\text{smaller}}{\text{Greater}} \times 100\right]\% = \left(\frac{9}{54} \times 100\right)\% = 16\frac{2}{3}\%$

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

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12. X's weight is 30% less than Y's. Then Y's weight is more than X's by

$\left(\frac{30}{70} \times 100\right)\% = 42\frac{6}{7}\%$

Ans: (B) $42\frac{6}{7}\%$

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13. The present population of a city is 36300. It has been increasing at 10% per annum. Its population 2 years ago was

$\frac{36300}{\left(\frac{11}{10}\right)^2} = 36300 \times \frac{100}{121} = 30000$

Ans: (D) $30{,}000$

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14. An article costs ₹2000. To gain 12%, it must be sold for

$\text{S.P} = \frac{100+12}{100} \times 2000 = 2240$

Ans: (B) ₹2240

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15. If a discount of $D\%$ is given on the marked price, the selling price is

$\text{S.P} = \text{M.P} - \frac{D}{100}\text{M.P} = \frac{100-D}{100} \times \text{M.P}$

Ans: (B) $\frac{100-D}{100} \times \text{M.P}$

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16. Two phones are sold at ₹1820 each, one at 30% profit and the other at 30% loss. On the whole there is a

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

$\left(\frac{30}{10}\right)^2 = 9\%$

Ans: (A) loss of 9%

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17. If the cost price of 30 articles equals the selling price of 25 articles, then there is a

$30x = 25y \Rightarrow \frac{y}{x} = \frac{6}{5}$

$\left(\frac{y}{x} - 1\right) \times 100 = 20\%$ (a gain)

Ans: (C) 20% **gain**

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18. The sum of five numbers is 640. The average of the first two is 110 and the third number is 150. The average of the last two numbers is

$x_1 + x_2 = 220$; $x_4 + x_5 = 640 - 220 - 150 = 270$

Average $= \frac{270}{2} = 135$

Ans: (D) 135

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19. The average of a batsman in 15 innings is 36. To raise his average by 2, the runs he must score in the 16th innings are

$16(38) - 15(36) = 608 - 540 = 68$

Ans: (C) 68

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20. A train leaves at 8.50 am at 60 km/h. It covers 210 km at

$T = \frac{210}{60} = 3\frac{1}{2}$ h $= 3$ h 30 min

8.50 am $+3$ h 30 min $=$ 12.20 pm

Ans: (A) 12.20 pm

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21. A man goes to a place at 24 km/h and returns by the same route at 40 km/h. His average speed for the whole journey is

$\frac{2\times 24\times 40}{24+40} = \frac{1920}{64} = 30\ \text{km/h}$

(Not the simple average of the two speeds.)

Ans: (C) 30 **km/h**

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22. The speeds of two runners are 25 km/h and 35 km/h. The ratio of the times they take for the same distance is

$T_1 : T_2 = s_2 : s_1 = 35 : 25 = 7 : 5$

Ans: (B) $7 : 5$

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23. When a train crosses a bridge, the distance it covers is

The engine must travel the whole bridge and then the whole train must clear it: train $+$ bridge.

Ans: (C) length of the train + length of the bridge

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24. A sum amounts to ₹960 in 3 years and to ₹1040 in 5 years at simple interest. The sum is

S.I for 2 years $= 1040 - 960 = 80$, so 40 per year

$P = 960 - 3 \times 40 = 840$

Ans: (D) ₹840

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25. The population of a town is 50000. It increases by 2% in the first year and by 4% in the second. The population after 2 years is

$50000 \times \frac{102}{100} \times \frac{104}{100} = 53040$

Ans: (A) $53{,}040$