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Reg. No. : .....

Code No. : 30939 E **Sub. Code : FSMA 11**

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2024.

First Semester

Mathematics

Skill Enhancement Course — MATHEMATICS FOR COMPETITIVE EXAMINATION — I

(For those who joined in July 2024 onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 1 = 10$ marks)

Answer ALL questions.

Choose the correct answer.

1. $\left(1-\frac{1}{3}\right)\left(1-\frac{1}{4}\right)\left(1-\frac{1}{5}\right).....\left(1-\frac{1}{100}\right) =$

(a) $\frac{99}{100}$ (b) $\frac{1}{100}$

(c) $\frac{1}{50}$ (d) $\frac{9999}{10000}$

2. $999\frac{998}{999} \times 999 =$ _____

(a) 997002 (b) 998001

(c) 998999 (d) 999998

3. The sum of two numbers is 80. If three times of one number is equal to five times of the other, then their product is _____

(a) 800 (b) 1500

(c) 2100 (d) 1600

4. A number is 25 more than its $\frac{2}{5}$th. Then the number is _____.

(a) 30 (b) 60

(c) $\frac{125}{7}$ (d) $\frac{125}{3}$

5. An umbrella marked as Rs. 80 is sold for Rs. 68. Then the rate of discount is _____

(a) 12% (b) 15%

(c) 20% (d) 18%

6. A ball is bought for Rs. 75 and sold at a gain of 8%. Then its setting price is Rs. _____

(a) 81 (b) 83

(c) 78 (d) 100

7. If $a:b = 3:4$ and $b:c = 8:9$, then $a:c =$ _____

(a) 3 : 9 (b) 1 : 3
(c) 2 : 3 (d) 1 : 2

8. $\frac{1}{2} : \frac{2}{3} : \frac{3}{4} =$ _____

(a) 6 : 8 : 9 (b) 1 : 2 : 3
(c) 2 : 3 : 4 (d) 3 : 4 : 8

9. A and B started a business by investing Rs. 5,000 and Rs. 2,000 respectively and earned Rs. 1,400 as profit. Then the share of B in the profit is _____.

(a) Rs. 400 (b) Rs. 200
(c) Rs. 1,000 (d) Rs. 700

10. 40% of _____ = 240

(a) 600 (b) 960
(c) 60 (d) 6000

PART B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Simplify : $\frac{(736+264)^2 + (736-264)^2}{(736 \times 736) + (264 \times 264)}$.

Or

(b) The average marks scored by the students of a class is 68. The average of marks of the girls in the class is 80 and that of boys is 60. What is the percentage of the numbers of boys in the class?

12. (a) The sum of one-half, one-third and one-fourth of a number exceeds the numbers by 12. Obtain the number.

Or

(b) Twenty-three times a positive integer is more than its square by 63. Find the integer.

13. (a) A person lost 20% by selling a bicycle for Rs. 1536. What percent shall be gain by selling it for Rs. 2040?

Or

(b) A vendor sells lemons at 5 for a rupee gaining 40%. How many did be buy for 100 rupees?

14. (a) If $a : b = 1 : 3, b : c = 5 : 7, c : d = 9 : 8$, estimate $b : d$.

Or

(b) If 20% of $(P + Q)$ is equal to 50% of $(P - Q)$, then evaluate $P : Q$.

15. (a) A started a business with Rs. 4,500 and was joined afterwards by B with Rs. 5,400. If the profits at the end of the year were divided in the ratio 2:1, then compute the number of months after which B joined the business.

Or

(b) A and B invest in a business in the ratio 3:2. If 5% of the total profit goes to charity and A's share is Rs. 8,550, then evaluate the total profit.

PART C — ($5 \times 8 = 40$ marks)

Answer ALL questions.

16. (a) If a,b,c are positive integers such that $a^2 + b^2 = 45$ and $b^2 + c^2 = 40$, then find the values of a,b,c.

Or

(b) Three years ago the average age of A and B was 18 years. With C joining them now, the average becomes 22 years. What is the age of C?

17. (a) If a number is subtracted from the square of its one-half, the result is 48. Compute its square rest.

Or

(b) Two numbers are in the ratio 9:5 and their product is 11520. Find the sum of them.

18. (a) Arun purchased a T.V set at 20% discount. If he gets a discount of 25%, he saves Rs. 1,800 for how much does he purchase the T.V. set?

Or

(b) A man sold two articles at Rs. 12 each. On one he gained 20% and on the other lost 20%. Verify whether he gained or lost on the whole.

19. (a) When 1 is added to each of the given two numbers, their ratio becomes 3:4. When 5 is subtracted from each, the ratio becomes 7:10. Find the numbers.

Or

(b) $(x^2 + y^2) : (x^2 - y^2)$ Põs.

If $(x + y) : (x - y) = 4 : 1$, then find

$(x^2 + y^2) : (x^2 - y^2)$

20. (a) A and B are partners in a business. A contributes one-fourth of the capital for 15 months and B received $\frac{2}{3}$ of the profit. Find for how long B's investment was used.

Or

(b) If the side of a square is increased by 25%, then find the percentage of increase in its area.
