Reg. No. : ....

Code No. : 10428 E   **Sub. Code : CNMA 31**

U.G. (CBCS) DEGREE EXAMINATION, APRIL 2023.

Third Semester

Mathematics — Non Major Elective

MATHEMATICS FOR COMPETITIVE
EXAMINATION – I

(For those who joined in July 2021 onwards)

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL the questions.

Choose the correct answer :

1. $\dfrac{11}{4} = \dfrac{77}{?}$

    (a) 28   (b) $\dfrac{77}{28}$

    (c) 44   (d) 308

2. $5005 - 5000 \div 10.00 = $ _____.

    (a) 0.5   (b) 50

    (c) 5000   (d) 4505

3. Divide 455 in the ratio 4 : 3.

    (a) 260, 195   (b) 255, 200

    (c) 250, 205   (d) 265, 190

4. If $2A = 3B = 4C$ then $A : B : C$ is

    (a) 2 : 3 : 4   (b) 4 : 3 : 2

    (c) 6 : 4 : 3   (d) 3 : 4 : 6

5. A, B, C started a business by investing Rs.1,20,000, Rs.1,35,000 and Rs.1,50,000 respectively. A's share out of an annual profit of Rs.56,700 is _____.

    (a) Rs.15,000

    (b) Rs.16,800

    (c) Rs.17,800

    (d) Rs.20,000

6. A number increased by $37\frac{1}{2}\%$ gives 33. The number is _____.

    (a) 22   (b) 24

    (c) 25   (d) 27

7. By selling an article for Rs.100, one loses Rs.10. Then loss percentage is _____.

    (a) $11\frac{1}{9}\%$ (b) $9\frac{1}{11}\%$

    (c) 10%   (d) 11%

8. Cost price = Rs.56.25, Profit = 20%, selling price = _____.

    (a) Rs.62.50   (b) Rs.60

    (c) Rs.67.50   (d) Rs.66.25

9. $\dfrac{3}{4}$ of a number is 19 less than the original number. The number is _____.

    (a) 84   (b) 64

    (c) 76   (d) 72

10. 11 times a number gives 132. The number is _____.

    (a) 11   (b) 12

    (c) 13.2   (d) 13

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) $15\frac{2}{3} \times 3\frac{1}{6} + 6\frac{1}{3} = 11\frac{7}{18} + ?$

    Or

    (b) Find the value of $\dfrac{9^2 \times 18^4}{3^{16}}$.

12. (a) In a mixture of 35 litres, the ratio of milk and water is 4:1. Now, 7 litres of water is added to the mixture. Find the ratio of milk and water in the new mixture.

    Or

    (b) Find the fourth proportional to 4, 5 and 12.

13. (a) A and B started a business and invested Rs.20,000 and Rs.25,000 respectively. After 4 months B left and C joined by investing Rs.15,000. At the end of the year, there was a profit of Rs.4,600. What is the share of C?

    Or

    (b) A, B, C enter in to a partnership and their capitals are in the proportion of $\dfrac{1}{3} : \dfrac{1}{4} : \dfrac{1}{5}$. A withdraws half his capital at the end of 4 months. Out of a total annual profit of Rs.847, what will be A's share?

14. (a) A reduction of 20% in the price of sugar enables a purchaser to obtain 4 kg more for Rs.160. What is the reduced price per kg? Also, find its original rate?

Or

(b) A man sells an article at a profit of 20%. If he had bought it at 20% less and sold it for Rs.5 less, he would have gained 25%. Find the cost price of the article.

15. (a) A fraction becomes 4 when 1 is added to both numerator and denominator. and it becomes 7 when 1 is subtracted from both the numerator and denominator. What is the numerator of the fraction?

Or

(b) The sum of squares of two numbers is 80 and the square of their difference is 36. Find the product of the numbers.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

16. (a) If $\dfrac{x}{2y} = \dfrac{3}{2}$ then find the value of $\dfrac{2x+y}{x-2y}$.

Or

(b) The average of 5 consecutive numbers is n. If the next two numbers are also included the average will be increased 7 by how much?

17. (a) Two numbers are in the ratio 3:5. If each number is increased by 10, the ratio becomes 5:7. Find the numbers.

Or

(b) Two equal glasses are respectively $\dfrac{1}{3}$ and $\dfrac{1}{4}$ full of milk. They are then filled up with water and the contents mixed in a tumbler. Find the ratio of milk and water in the tumbler?

18. (a) A reduction of 21% in the price of wheat enables a person to buy 10.5 kg more for Rs.100. What is the reduced price per kg?

Or

(b) 72% of the students of a certain class took Biology and 44% took Mathematics. If each student took Biology or Mathematics and 40 took both, find the total number of students in the class.

19. (a) 'A' bought 25 kg of rice at the rate of Rs.6 per kg and 35 kg of rice at the rate of Rs 7 per kg. He mixed the two and sold the mixture at the rate of Rs.6.75 per kg. What was his profit or loss in the transaction?

Or .

(b) Find the single discount equivalent to a series discount of 20%, 10% and 5%.

20. (a) Divide 50 into two parts so that the sum of their reciprocals is $\dfrac{1}{12}$.

Or

(b) The sum of squares of two numbers is 80 and the square of their difference is 36. Find the product of the numbers?