

Grade  
**8**

# Grand Finale 2024-25

---

## M-CAT Question Paper

### NMA025

Return the answer sheet along with question paper to the invigilator at the end of the exam.



TOTAL MARKS  
**100**



QUESTIONS  
**50**



DURATION  
**60 mins**



### Instructions for Student:

- Read the question carefully before answering.
- Each question has 4 options (A, B, C & D).
- Choose one correct option as your answer, from the 4 options.
- Every question carries 2 marks.
- There will be an additional 0.5 Negative Marking for every wrong answer.
- On the answer sheet blacken the correct option against the corresponding question number,

The Correct Method

Q.	Answer
1	(A) (B) ● (D)

✓

The Wrong Methods

Q.	Answer
1	(A) ● ● (D)
1	(A) (B) ● (D)
1	(A) (B) ✓ (D)
1	(A) (B) ✗ (D)

✗

- Use pencil to mark your answer.
- If you wish to change your answer, erase the previous mark completely.

1. Find the value of  $t$  in the equation  $4t + 5 = -6t - 5$ .

- a.  $t = 2$                       b.  $t = -2$                       c.  $t = -1$                       d.  $t = 1$

2. Which property does the following expression show?

$$\frac{1}{5} \times \frac{2}{3} = \frac{2}{3} \times \frac{1}{5}$$

- a. Commutative property of multiplication  
b. Commutative property of addition  
c. Associative property of multiplication  
d. Associative property of addition

3. Which of the following statements is **INCORRECT**?

- a. Factorizing an expression means writing it as a sum of irreducible factors.  
b. Factors may be numbers, algebraic values, or algebraic expressions.  
c. One way to factorize an expression is to use the common factor method.  
d. The method of regrouping is used when all the terms in a given expression do not have a common factor.

4. A baker sells 5000 pastries in a month. 5% of the sold pastries were chocolate and 1% were strawberry. What is the number of other pastries sold by the baker?

- a. 2700                      b. 3700                      c. 4700                      d. 5700

5. If the diagonals of a quadrilateral bisect each other at right angle, then the polygon is known as \_\_\_\_\_.

- a. Kite                      b. Parallelogram                      c. Rhombus                      d. Rectangle

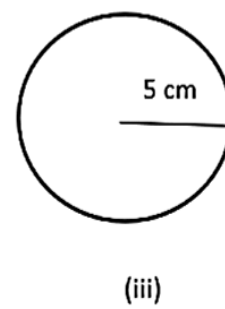
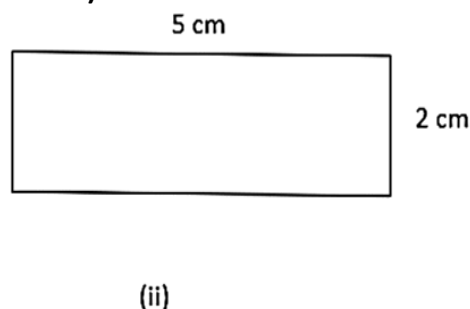
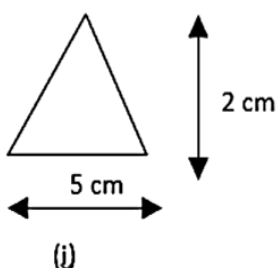
6. Simplify:  $\frac{7xp^2z - 35zxp^3q}{28xzp^2q}$

- a.  $\frac{1-5q}{40q}$                       b.  $\frac{1-5q}{4q}$                       c.  $\frac{1-5pq}{4q}$                       d.  $\frac{1-5pq}{4p^2q}$

7. What is the value of  $\frac{2^{5001} + 2^{4999}}{2^{5000} - 2^{4998}}$  ?

- a. 2                      b.  $\frac{10}{3}$                       c.  $2^{2000} + 1$                       d. 10

8. Which of the following options is **CORRECT** if  $a$ ,  $b$  and  $c$  are the areas of the given figures (i), (ii) and (iii) respectively? (Take  $\pi = 3.14$ )



- a.  $a < b < c$                       b.  $a > b > c$                       c.  $a < b > c$                       d.  $b < c > a$

**9. Which of the following statements is CORRECT?**

- a. Length of the side of a square and its area are directly proportional to each other.
- b. If one angle of a triangle is kept fixed then the measure of the remaining two angles are inversely proportional each other.
- c. The area of circle and its diameter are directly proportional to each other.
- d. None of these

**10. If a number has 1 in its units place, then which of the following can be its square?**

- a. 91
- b. 144
- c. 169
- d. 121

**11. What is the result obtained when the additive inverse of  $\frac{4}{3}$  is subtracted from the multiplicative inverse**

**of  $\frac{-5}{7} \times \frac{14}{15}$ ?**

- a.  $\frac{2}{3}$
- b.  $-\frac{1}{6}$
- c.  $\frac{-3}{2}$
- d.  $\frac{3}{2}$

**12. If  $\frac{4}{5}$  of a number is 12 less than the original number, then what is the original number?**

- a. 60
- b. 40
- c. 80
- d. 120

**13. If  $x^2 + \frac{1}{x^2} = 7$ , then find the value of  $\left(x + \frac{1}{x}\right)$ .**

- a. 6
- b. 9
- c. 3
- d. 4

**14. Kiran has ₹ 140 left after using 65% of the money she had. Find total amount of money that Kiran had before spending.**

- a. ₹ 100
- b. ₹ 500
- c. ₹ 350
- d. ₹ 400

**15. The perimeter of a triangular field is 144 m and the ratio of two of its sides is 3:4. If length of the third side of the field is 60 m, then what is the difference between the lengths of the remaining sides?**

- a. 12m
- b. 7m
- c. 84m
- d. 8m

**16. In a square ABCD, the diagonals bisect each other at O. What type of triangle is  $\Delta AOB$ ?**

- a. An equilateral triangle.
- b. An isosceles but not a right-angled triangle.
- c. A right angled but not an isosceles triangle.
- d. An isosceles right-angled triangle.

**17. Which of the following is INCORRECT about exponents and power?**

- a. A negative power is the multiplicative inverse of the base raised to the positive opposite of the power.
- b. The product of exponents with the same power is written as the power of an addition of the base.
- c. Any non-zero number raised to the power of 0 is equal to 1.
- d. When dividing two numbers with exponents, the exponents can be subtracted if the bases are the same.

**18. A shopkeeper has just enough money to buy 52 cycles worth ₹ 6300 each. If each cycle were to cost ₹ 252 more, then how many cycles, he will be able to buy with that amount of money?**

- a. 40
- b. 30
- c. 50
- d. 20

19. If  $\sqrt{1 - \frac{25}{169}} = 1 - \frac{x}{13}$ , then what is the value of x?

- a. 1                                      b. 14                                      c. 10                                      d. 12

20. What is the quotient obtained if  $30a^3(50a^2 - 72)$  is divided by  $20a^3(5a + 6)$ ?

- a.  $2(5a + 6)$                                       b.  $3(5a - 6)$                                       c.  $3(5a + 6)$                                       d. 3

21. Which of the following statements is TRUE about graphs?

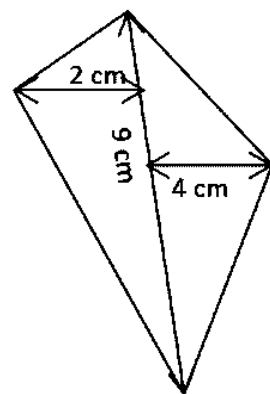
- a. The X-axis is a vertical line.  
b. The Y-axis is a horizontal line.  
c. The scale on both the axes must be the same in a Cartesian plane.  
d. The point of intersection of the X-axis and the Y-axis is called the origin.

22. What is the number of digits in the square root of 390625?

- a. 4                                      b. 6                                      c. 5                                      d. 3

23. Find the area of the given quadrilateral.

- a.  $26 \text{ cm}^2$   
b.  $27 \text{ cm}^2$   
c.  $29 \text{ cm}^2$   
d.  $25 \text{ cm}^2$



24. Simplify:  $\frac{2}{5} + \frac{8}{3} + \frac{-11}{15} + \frac{4}{5} + \frac{-2}{3}$

- a.  $\frac{37}{15}$                                       b.  $\frac{-37}{15}$                                       c.  $\frac{-36}{5}$                                       d.  $\frac{-38}{3}$

25. Simplify the given expression:  $\frac{1}{6}x + \frac{2}{5}xy - 13y - \frac{7}{5}xy + \frac{1}{6}x$

- a.  $\frac{1}{3}x - \frac{9}{5}xy - 13y$                                       b.  $\frac{1}{3}x + 1xy - 13y$   
c.  $\frac{1}{3}x - 1xy - 13y$                                       d.  $-1xy - 13y$

26. Which of the following can be used to find cube of 89?

- a.  $(90 - 1)^2$                                       b.  $(90 - 1)^3$                                       c.  $(80 + 9)^2$                                       d. 92

27. Which of the following is the solution of the following equation?

$$\frac{a}{5} - \frac{2a}{3} + \frac{3a}{5} = 2$$

- a. 5                                      b.  $-\frac{1}{5}$                                       c.  $-\frac{1}{3}$                                       d. 15

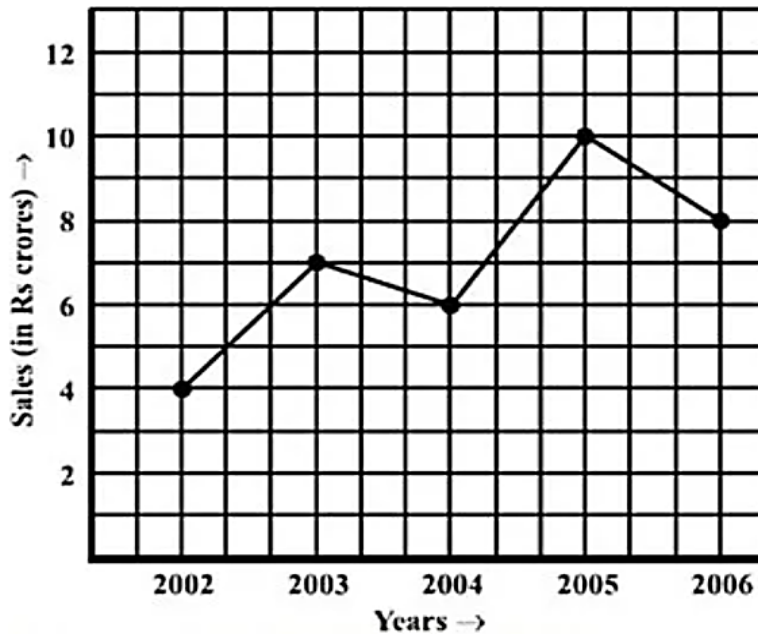
28. Factorize the given expression:  $2x^3 + 5x^2y - 12xy^2$

- a.  $x(x + 2y)(2x + 3y)$   
b.  $x(x + 4y)(2x - 3y)$   
c.  $x(x - 4y)(2x - 3y)$   
d.  $x(x + 2y)(x - 3y)$

29. What is the percentage of loss incurred if the amount of loss made by selling 120 roses is equal to the cost price of 15 roses?

- a. 12.5%                      b. 13%                      c. 12.75%                      d. 13.5%

30. The following line graph shows the yearly sales for a manufacturing company:



In which year was there the greatest difference between the sales as compared to the previous year?

- a. Year 2003                      b. Year 2004                      c. Year 2005                      d. Year 2006

31. A children's library is moving to a new building. All the books have been packed into cartons measuring  $40\text{ cm} \times 30\text{ cm} \times 30\text{ cm}$ . There are 2950 such cartons. The library has hired a moving company to transport the cartons to the new building. The interior dimensions of the storage area of the truck are  $9\text{ m} \times 3\text{ m} \times 4\text{ m}$ . How many trips will the truck have to make to move all the cartons?

- a. 1                      b. 3                      c. 7                      d. 10

32. If the total of four consecutive odd numbers is 384, then what is the smallest number?

- a. 93                      b. 99                      c. 111                      d. 113

33. All sides of a four-sided polygon are equal in length and its diagonals bisect each other at  $90^\circ$ . What would be the angle between the two adjacent sides of the given polygon?

- a. Exactly  $90^\circ$   
b.  $90^\circ$  or any acute angle  
c.  $90^\circ$  or any obtuse angle  
d. Can be any angle

34. A telescope magnifies a planet 40000 times, resulting in a diameter of 6 cm in the image. If the magnification is reduced to 20000 times, then what would be its diameter in the image?

- a. 10 cm                      b. 12 cm                      c. 4 cm                      d. 3 cm

35. If  $\sqrt[3]{-512} \div \sqrt[3]{0.008} = x$ , then find the value of  $x$ .

- a. 40                      b. -40                      c. 4.0                      d. -4.0

36. Which of the following is equal to  $x^3(a - 2b) + x^2(a - 2b)$ ?

- a.  $x^2(a - 2b)(x + 1)$
- b.  $(x^2 - 1)(a - 2b)$
- c.  $(x^2 + 1)(a - 2b)(x + 1)$
- d.  $x(a - 2b)(x - 1)$

37. The sum of two expressions is  $x^3 - x^2 + 3x - 2$ . If one of them is  $x^2 + 5x - 6$ , then which of the following is the other expression?

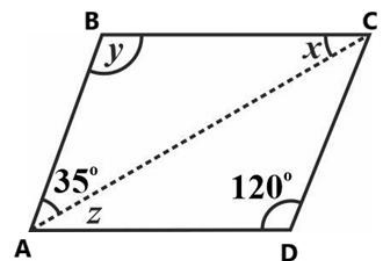
- a.  $x^3 - 2x^2 - 2x - 4$
- b.  $x^3 + 3x^2 - 2x + 4$
- c.  $x^3 - 2x^2 - 2x + 4$
- d.  $-x^3 - 2x^2 - 2x - 4$

38. A recipe for 20 rolls needs 5 tablespoons of butter. How many tablespoons of butter is needed for 12 rolls?

- a. 6
- b. 7
- c. 7.5
- d. 3

39. Find the unknown angles  $x$ ,  $y$  and  $z$  for the given parallelogram ABCD.

- a.  $x = 25^\circ$ ,  $y = 120^\circ$ ,  $z = 25^\circ$
- b.  $x = 35^\circ$ ,  $y = 120^\circ$ ,  $z = 45^\circ$
- c.  $x = 25^\circ$ ,  $y = 120^\circ$ ,  $z = 30^\circ$
- d.  $x = 45^\circ$ ,  $y = 120^\circ$ ,  $z = 25^\circ$



40. Arrange the following in descending order:

- (i)  $2 \times 10^3 + 4 \times 10^2 + 8 \times 10^{-1} + 7 \times 10^{-2}$
  - (ii)  $2 \times 10^3 + 4 \times 10^2 + 7 \times 10^{-1} + 8 \times 10^{-2}$
  - (iii)  $4 \times 10^3 + 2 \times 10^2 + 7 \times 10^{-1} + 8 \times 10^{-2}$
  - (iv)  $4 \times 10^3 + 2 \times 10^2 + 8 \times 10^{-1} + 7 \times 10^{-2}$
- a. (iii) > (iv) > (i) > (ii)
  - b. (iv) > (iii) > (ii) > (i)
  - c. (iii) > (iv) > (ii) > (i)
  - d. (iv) > (iii) > (i) > (ii)

41. What is the Marked Price of an item bought for ₹ 900 after a discount of 10%?

- a. ₹ 1100
- b. ₹ 1000
- c. ₹ 810
- d. ₹ 1200

42. A cylindrical can has a diameter of 14 cm and a height of 18 cm. Find the volume of the can. If you have an empty jug with a capacity of 2.5 L, will the contents of the can fit in the jug?

- a. Volume of can is 2772 cubic cm. No, the content will not fit in the jug.
- b. Volume of can is 2772 cubic cm. Yes, the content will fit in the jug.
- c. Volume of can is 3772 cubic cm. No, the content will not fit in the jug.
- d. Volume of can is 3772 cubic cm. Yes, the content will fit in the jug.

43. Find the value of  $\left(\frac{5}{9} \div \frac{15}{36}\right) \div \left(\frac{-5}{6}\right)$ .

- a.  $\frac{-4}{3}$
- b.  $\frac{3}{5}$
- c.  $\frac{-8}{5}$
- d.  $\frac{-3}{8}$

44. If  $n$  is a negative integer, then which of the following must always be a negative integer?

- a.  $n + 2$
- b.  $n^2 + 1$
- c.  $n^2 - 5$
- d.  $2n$

45. The given figure can be classified under which of the following categories?

- a. Convex polygon
- b. Concave polygon
- c. Simple closed curve
- d. Quadrilateral



46. The square of a natural number added to its cube becomes 576. What is the number?

- a. 8
- b. 3
- c. 24
- d. 1

47. Which is the most consumed beverage out of tea, coffee and milk, based on the list given below?

tea, tea, coffee, milk, tea, milk, tea, coffee, tea, coffee, milk, tea

- a. milk
- b. coffee
- c. tea
- d. tea and coffee

48. Which of the following options shows the frequency distribution of number of visitors for India, Singapore, Malaysia and Australia?

India, Australia, Singapore, Malaysia, Malaysia, Australia, India, Malaysia, Australia, Singapore, Australia, Australia, Singapore, Singapore, Australia, India, Malaysia, Singapore, Singapore, Malaysia, India.

a.

Country	Tally Marks
Australia	
India	
Malaysia	
Singapore	

b.

Country	Tally Marks
Australia	
India	
Malaysia	
Singapore	

c.

Country	Tally Marks
Australia	
India	
Malaysia	
Singapore	

d.

Country	Tally Marks
Australia	
India	
Malaysia	
Singapore	

49. A bag has 5 food items as shown below:

Apple – 1	Banana – 1	Bread – 1	Chocolate – 1	Toffee – 1
-----------	------------	-----------	---------------	------------

What is the number of possible outcomes of one food item picked from the bag?

- a. 6
- b. 2
- c. 3
- d. 5

50. Which of the following is TRUE about pie chart?

- a. Angle Segment =  $\frac{\text{Percentage Value}}{\text{Data Value}} \times 360$
- b. Angle Segment =  $\frac{\text{Data Value}}{\text{Total Value of Data}} \times 360$
- c. Angle Segment =  $\frac{\text{Percentage Value}}{\text{Data Value}} \times 180$
- d. Angle Segment =  $\frac{\text{Data Value}}{\text{Total Value of Data}} \times 180$



ROUGH WORK