



M-CAT GRAND FINALE

Sample Paper

(Based on the new exam pattern)



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.
- **New Exam Pattern:**
 1. Each question will carry 1, 2, or 4 marks, depending on its difficulty level.
 2. **Negative Marking:** Additional marks will be deducted for every incorrect answer (0.25 marks for a 1-mark question, 0.5 marks for a 2-mark question, and 1 mark for a 4-mark question).
 3. The Assessment Round score will be included in the Grand Finale score using a weighted average method. 30% of the Assessment Round and 70% of the Grand Finale score.
 4. New Method to Calculate Marks for Grand Finale Awards.

	Assessment Round	Grand Finale
Actual Marks	60	80
Weightage	30%	70%
Marks After Weighted Average Rule	$60 \times 30/100 = 18$	$80 \times 70/100 = 56$
Final Marks for Grand Finale Awards	$18 + 56 = 74$	

- On the answer sheet blacken the correct option against the corresponding question number.
- **Use pencil to mark your answer.**
- If you wish to change your answer, erase the previous mark completely.

All The Best !

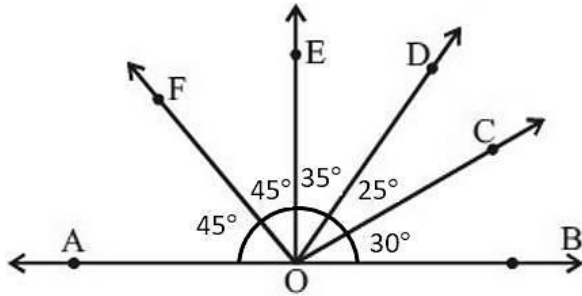
SECTION 1: Concept Check

1. What is the number seven billion six hundred thousand and fifty written in expanded form? (1m)
 - a. $7,000,000,000 + 600,000 + 50$
 - b. $7,000,000,000 + 60,000 + 50$
 - c. $7,000,000,000 + 650,000$
 - d. $7, 00,000 + 6,000 + 50$
2. Which of the following numbers has exactly 4 factors? (1m)
 - a. 16
 - b. 14
 - c. 18
 - d. None of these
3. How many faces (F), vertices (V) and edges (E) does a triangular prism have? (1m)
 - a. $F = 5, V = 8, E = 6$
 - b. $F = 5, V = 9, E = 5$
 - c. $F = 5, V = 8, E = 5$
 - d. $F = 5, V = 6, E = 9$
4. The opposite of -136 is 136. Which of the following is the only integer that does not have an opposite? (1m)
 - a. -100
 - b. 0
 - c. No such number exists in the integer set
 - d. 476
5. Which of the following represent group of numbers separated by commas in a number in any number system? (1m)
 - a. Place
 - b. Digit
 - c. Period
 - d. None of these
6. Which of the following is the CORRECT decimal form of 'Six hundred and six and seven-hundredths'? (1m)
 - a. 606.007
 - b. 606.07
 - c. 606
 - d. 606.7
7. Angle which is less than 360° but larger than 180° is classified as _____. (1m)
 - a. Acute angle
 - b. Obtuse angle
 - c. Reflex angle
 - d. Right angle

8. Which of the following is the smallest six-digit number that can be formed using the digits 7, 0, 9, 8, 6 and 5? (1m)

- a. 0, 56, 789
- b. 5, 67, 890
- c. 5, 06, 789
- d. 0, 98, 765

9. How many obtuse angles are there in the given figure? (1m)



- a. 1
- b. 2
- c. 3
- d. 4

10. The rule which gives the number of matchsticks required to make the matchsticks pattern S is _____. (1m)

- a. $3l$
- b. $4n$
- c. $5n$
- d. $6n$

SECTION 2: Applied Mathematics

11. Which of the following is the decimal form of $200 + 30 + 3 + \frac{2}{10} + \frac{9}{100}$? (2m)

- a. 23.29
- b. 25.29
- c. 233.29
- d. 23.359

12. If 'x' and 'y' are two whole numbers and the difference $(y - x)$ is given, then under what condition can it be said that the closure property is applicable to subtraction? (2m)

- a. $x < y$
- b. $x > y$
- c. Both a & b
- d. Cannot determine

13. Find the length of a side of an equilateral triangular garden whose perimeter is 660 m. (2m)

- a. 660 m
- b. 110 m
- c. 30 m
- d. 220 m

14. Three lights blink at intervals of 32 sec, 24 sec and 12 sec. After how much time will all the three lights blink together? (2m)
- 96 sec
 - 98 sec
 - 36 sec
 - 38 sec
15. How does the value of a digit change as it moves from the right to the left in a place value chart? (2m)
- Decreases by 10 times
 - Decreases by $\frac{1}{10}$ times
 - Increases by 10 times
 - Increases by $\frac{1}{10}$ times
16. The product of two whole numbers is $(6 + 3) \times (6 + 4)$. One of the whole numbers is 5 more than the smallest possible whole number. Find the difference between the two numbers. (2m)
- 18
 - 13
 - 5
 - 0
17. How many pairs of adjacent angles are there in a quadrilateral? (2m)
- 1
 - 2
 - 3
 - 4
18. The difference between the smallest 3-digit number and greatest 2-digit number is _____. (2m)
- I
 - XX
 - XC
 - C
19. If A, B, C are three points on a line such that $AB = 12$ cm, $BC = 3$ cm and $AC = 15$ cm, which one of the points lies between the other two points? (2m)
- Point A lies between points B and C
 - Point B lies between points A and C
 - Point C lies between points A and B
 - Can't say
20. What least value should be given to ® so that the number 653®48 is divisible by 2? (2m)
- 9
 - 6
 - 7
 - 1
21. What is the expanded form of 79.058? (2m)
- $79 + \frac{5}{10} + \frac{8}{100}$
 - $70 + 9 + 0 + \frac{5}{100} + \frac{8}{1000}$
 - $70 + 9 + \frac{5}{10} + \frac{8}{100}$
 - $79 + 90 + \frac{5}{100} + \frac{8}{1000}$

22. Choose the value of 'a' that satisfies the equation $13a = -65$. (2m)

- a. 5
- b. 30
- c. -5
- d. 10

23. Solve: $CXX + LV - XIV$ (2m)

- a. XCLI
- b. CLIX
- c. CLXI
- d. LCIX

24. The length of a rectangle is twice its breadth. If its area is 242 sq. m., then which of the following expressions is CORRECT? (Hint: Let the breadth be b .) (2m)

- a. $3b = 242$
- b. $l + b = 242$
- c. $b^2 = 121$
- d. $l \times b = 121$

25. What is the value of $505 \times 149 - 505 \times 49$? (2m)

- a. 555,931
- b. 1,210,321
- c. 99,990
- d. 50,500

SECTION 3: Case-Based Mathematics

26. Tanya is standing in her classroom, facing north. Her teacher asks her to make five quarter turns in a clockwise direction. After completing all the turns, in which direction will Tanya be facing? (2m)

- a. East
- b. West
- c. North
- d. South

27. A machine produces 2938 screws in a day. Which of the following is the best estimate nearest to thousands for the number of screws? (2m)

- a. 3500
- b. 5000
- c. 3000
- d. 2900

28. Siddharth's age is $3x$ years and Sahil is 7 years older than Siddharth. (2m)

What is Sahil's age?

- a. $3x + 7$
- b. $7x/3$
- c. $3x - 7$
- d. $21x$

29. Which of the following may be expressed by the expression $2x - 3$? (2m)

- a. John's age is 3 years less than twice Dave's age.
- b. John's age is 3 years less than Dave's age.
- c. John's age is 3 years more than twice Dave's age.
- d. John's age is 3 years more than Dave's age.

30. A school has 1000 students out of which 400 are girls. What is the ratio of the number of girls to the number of boys in the schools? (2m)

- a. 4: 1
- b. 4: 10
- c. 6: 4
- d. 2: 3

31. On a frame of dimensions 1050 cm x 850 cm wide, a square shaped picture is stuck at the centre whose side measure is 2.5 m. What is the cost incurred to paint the remaining part of the frame at the rate of ₹ 1.2 per sq. m? (2m)

- a. ₹ 89.25
- b. ₹ 99.6
- c. ₹ 830
- d. ₹ 12

32. If the cost of 15 watermelons is ₹ 1500, then what is the cost of 8 watermelons? (2m)

- a. ₹ 700
- b. ₹ 1000
- c. ₹ 300
- d. ₹ 800

33. Nikita's balloon shop has $\frac{2}{7}$ white balloons and $\frac{3}{7}$ blue balloons. What fraction of the balloon are neither white nor blue? (2m)

- a. $\frac{1}{7}$
- b. $\frac{2}{7}$
- c. $\frac{3}{7}$
- d. $\frac{4}{7}$

34. Amit wants to plough his triangular field. The base of the field is 250 m and its height is 600 m. What is the total cost of ploughing the field at the rate of ₹ 1.2 per m^2 ? (2m)

- a. ₹ 90,000
- b. ₹ 1,50,000
- c. ₹ 1,80,000
- d. ₹ 2,50,000

35. During a classroom renovation, a carpenter needs to measure the length, breadth, and height of a rectangular room using a tape of fixed length. The dimensions of the room are 400 cm, 425 cm, and 450 cm. To make the measurement convenient, the tape should be the longest possible length that can measure all three dimensions exactly. What should be the length of the tape? (2m)

- a. 31 cm
- b. 30 cm
- c. 25 cm
- d. 35 cm

Answer questions 36 – 39 based on the below pictograph.

The following pictograph gives information about the number of students in various standards of a school.

Standard	Number of students
VII	    
VIII	     
IX	       
X	     

Key: 1  = 5 boys; 1  = 4 girls

36. How many girls are there in the school? (2m)

- a. 120
- b. 52
- c. 65
- d. 85

37. Which two classes have the same number of boys? (2m)

- a. VII and X
- b. VIII and IX
- c. VII and IX
- d. IX and X

38. Which of the following is true? (2m)

- a. Grade X has the same number of boys and girls.
- b. Grade X has 5 more girls as compared to boys.
- c. Grade X has 3 more boys as compared to girls.
- d. Grade X has 2 more boys as compared to girls.

39. If 4 new girls join grade IX then what is the difference between the number of girls and boys in the class? (2m)

- a. 4
- b. 2
- c. 1
- d. 0

40. A shopkeeper buys an item for ₹ 500 and sells it at a profit of 10%. He increases his selling price to increase his profit to 20%. What is the ratio of the original selling price to the new selling price? (2m)

- a. 10 : 11
- b. 11 : 12
- c. 12 : 11
- d. 5 : 6

41. At 6 a.m., the temperature at a hill station was -7°C . By noon, it increased by 12°C . In the evening, it dropped by 9°C . What was the temperature in the evening? (2m)
- -16°C
 - -4°C
 - 4°C
 - 14°C
42. A school has 7 buses. Each bus can carry 48 students. On a particular day, 25 seats are empty in total. How many students travelled by bus that day? (2m)
- 311
 - 319
 - 326
 - 361
43. A gardener makes a triangular flower bed. Two of its angles are 35° and 75° . He claims that the third angle is an obtuse angle. Which evaluation is correct? (2m)
- Correct; the third angle is 110°
 - Correct; the third angle is 120°
 - Incorrect; the third angle is 70°
 - Incorrect; the third angle is 80°
44. On a school picnics the ratio of students to teachers is 100 : 4. If there are 1500 students how many teachers will accompany them? (2m)
- 40
 - 50
 - 60
 - 70
45. Kiran has ₹ 200 in his savings box. He saves ₹ 25 every week. After some weeks, he has ₹ 450. How many weeks did he save? (2m)
- 8
 - 10
 - 12
 - 15

SECTION 4: Challenger's Section

46. Read the following statements about ratios carefully: (4m)
- A ratio does not have any unit.
 - A ratio is an expression, whereas a proportion is an equation.
 - A ratio compares quantities with identical units, while a proportion represents a relationship between two ratios.
 - The value of some units is equal to the value of two units multiplied by the number of units required.
- Which of the above statements is/are INCORRECT?
- 1, 2 and 3
 - Only 2
 - 3 and 4
 - Only 4

47. Anya is learning about the properties of circles. Her teacher draws a circle on the board and asks Anya to draw a line segment connecting two points on the circumference of the circle. (4m)

Statement – I: Anya has drawn a diameter of the circle.

Statement – II: Anya has drawn a chord of the circle.

- a. Both Statement – I and Statement – II are true
- b. Statement – I is false but Statement – II is true
- c. Statement – I is true but Statement – II is false
- d. Both Statement – I and Statement – II are false

48. Read the given statements carefully and select the CORRECT option. (4m)

Statement – I: If the ratio of boys to girls in a class is 3 : 5, then the number of boys is $\frac{3}{8}$ of the total number of students.

Statement – II: If $a : b = 2 : 3$ and $b : c = 4 : 5$, then $a : b : c = 2 : 3 : 5$.

- a. Both Statement – I and Statement – II are true.
- b. Statement – I is false but Statement – II is true.
- c. Statement – I is true but Statement – II is false.
- d. Both Statement – I and Statement – II are false.

49. Read the given statements carefully and select the CORRECT option. (4m)

Statement – I: If $4x + 7 = 31$, then the value of x is 6.

Statement – II: If $3(y - 2) = 18$, then the value of y is 8.

- a. Both Statement – I and Statement – II are true.
- b. Statement – I is false but Statement – II is true.
- c. Statement – I is true but Statement – II is false.
- d. Both Statement – I and Statement – II are false.

50. Gina wants to put a fence around a rectangular vegetable garden that is 18 m long and 12 m wide. She also wants to divide the garden into two equal parts by placing a fence along its width. What is the area of each half of the garden and the total length of fencing required? (4m)

- a. 216 m^2 , 60 m
- b. 216 m^2 , 72 m
- c. 108 m^2 , 72 m
- d. 216 m^2 , 66 m

