

Masco Olympiad 2018 - 19.

Organized by Nivrithi Education and Social Trust, Karur.

Duration : 3 Hours

Max Marks : 100

Instructions

- Mark the answers in the sheet provided.
- No negative marking.
- **Use only black / blue pen** for shading the correct answers.
- Nothing should be written in the Question paper.
- Rough work should be done in the rough papers provided only.
- Candidate gets **rejected** while submission, if either the question paper has any markings / writings or the rough work is done in question paper.
- Question paper are to be returned.

Mathematics

1. Simplify: $\sqrt[5]{\sqrt[4]{(2^4)^3}} - 5\sqrt[5]{8} + 2\sqrt[5]{\sqrt[4]{(2^3)^4}}$
(A) $-2\sqrt[5]{2^3}$ (B) $\sqrt[5]{2^3}$ (C) $2\sqrt[5]{2^3}$ (D) $-\sqrt[5]{2^3}$
2. Probability of an event can be
(A) -0.7 (B) $\frac{11}{9}$ (C) 1.001 (D) 0.6
3. If the perpendicular distance of a point P from x axis is 5 units, then the point P has
(A) x coordinate = -5 or 5 (B) y coordinate = 5 or -5
(C) y coordinate = -5 (D) y coordinate = 5
4. A person's present age is two fifth of the age of his mother. After 8 years, he will be half of the age of his mother. How old is the mother at present ?
(A) 32 years (B) 36 years (C) 40 years (D) 48 years
5. If $\sqrt{x+8} + \sqrt{2x+2} = 11$, then values of x is _____.
(A) 17 (B) 1, 17 (C) 1 (D) ϕ
6. The perimeter of a circle is equal to the perimeter of a square. Then, the ratio of their areas respectively, is _____.
(A) 4 : 1 (B) 11 : 7 (C) 14 : 11 (D) 22 : 7

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7. The sides of a quadrangular field, taken in order are 26 m, 27 m, 7 m and 24 m respectively. The angle contained by the last two sides is a right angle. Find its area.

- (A) 324 m² (B) 238.59 m² (C) 375.84 m² (D) 384.69 m²

8. If two third of a number is 15 less than the original number, find the number.

- (A) 45 (B) 39 (C) 48 (D) 42

9. The number of dimensions, a point has

- (A) 2 (B) 1 (C) 0 (D) 3

10. Twenty women can do a work in sixteen days. Sixteen men can complete the same work in fifteen days. What is the ratio between the capacity of a man and a woman?

- (A) 3:4 (B) 3:5 (C) 5:3 (D) None of these

11. What is the quotient when $(x^{-1} - 1)$ is divided by $(x - 1)$?

- (A) $-x$ (B) $-x^{-1}$ (C) x (D) x^{-1}

12. The angle sum of a convex polygon with 12 sides

- (A) 900 (B) 1020 (C) 1080 (D) 1800

13. The given below question is followed by three statements. You have to study the question and the statements and decide which of the statement(s) is/are necessary to answer the question. What is the capacity of the cylindrical tank ?

I. The area of the base is 61,600 sq. cm.

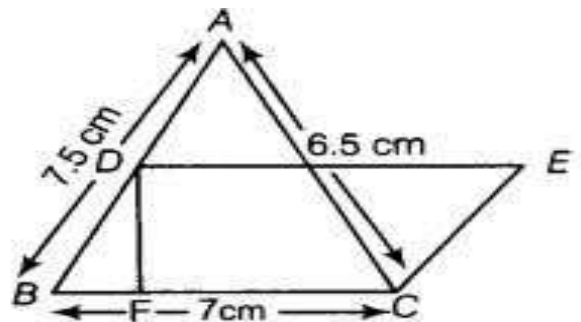
II. The height of the tank is 1.5 times the radius.

III. The circumference of base is 880 cm.

- (A) I and II (B) II and III (C) II and either I or III (D) Any two of the three

14. In the given figure, $\triangle ABC$ has sides $AB = 7.5$ cm, $AC = 6.5$ cm and $BC = 7$ cm. On the base BC a parallelogram $DBCE$ of area same as that of $\triangle ABC$ is constructed find the height DF of the parallelogram.

- (A) 7 cm (B) 5 cm
(C) 6 cm (D) 3 cm



15. Find a, if 212a5 is a multiple of 3 and 11.

- (A) 7 (B) 8 (C) 6 (D) 12

16. The number of diagonals a regular hexagon has

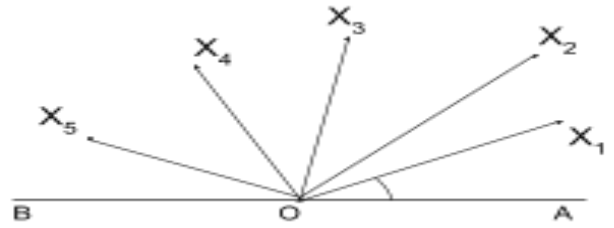
- (A) 8 (B) 4 (C) 6 (D) 9

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17. In which quadrant does the point P(x, y) lie if $xy < 0$?

- (A) I or II (B) II or IV (C) I or III (D) III or IV

18. In the following figure, AOB is a straight line and $\angle AOX_3 = 57^\circ$, $\angle X_1OX_4 = 97^\circ$, $\angle X_3OB = 123^\circ$ and $\angle X_4OB = 68^\circ$, Find $\angle AOX_1$.



- (A) 40° (B) 30°
 (C) 25° (D) 15°

19. Which of the following statements is INCORRECT?

- (A) There can be a real number which is both rational and irrational.
 (B) The sum of any two irrational numbers is not always irrational.
 (C) For any Positive integers x and y, $x < y \Rightarrow x^2 < y^2$
 (D) Every integer is a rational number.

20. Simplify: $\frac{1}{\sqrt{7} + \sqrt{6}} - \frac{5}{1 - \sqrt{6}} - 7$

- (A) 0 (B) 1/2 (C) 1/4 (D) 1

21. If 'l', 'b' and 'h' of a cuboid are increased, decreased and increased by 1%, 3% and 2% respectively, then the volume of the cuboid _____.

- (A) Increases (B) Decreases (C) Can't be calculated with given data
 (D) Increases or decreases depending on original dimensions

22. Find the value of $\frac{9^{3/2} - 3 \times 5^0 - [1/81]^{-1/2}}{(64/125)^{-2/3} + \left[\frac{1}{(256/625)^{1/4}} \right] + \left(\frac{\sqrt{25}}{\sqrt[3]{64}} \right)}$

- (A) 15 / 13 (B) 0 (C) 16 / 5 (D) 48 / 13

23. The area of the triangle formed by the equation $2x + 3y = 6$ and the coordinate axes is

- (A) 3 sq. units (B) 2 sq. units (C) 6 sq. units (D) 5 sq. units

24. Find the value of m, so that $y - 2x$ is a factor of $\frac{y^3}{4p^2} - 2y + mx$.

- (A) 0 (B) 1 (C) 2 (D) 3

25. The mean of 25 numbers is 8. If 2 are added to every number, what will be the new mean?

- (A) 10 (B) 6 (C) 8 (D) 7

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26. The sides of a cube are doubled, so the ratio between the volume of the first cube and the new cube is

- (A) 1:4 (B) 1:2 (C) 1:8 (D) None of these

27. The perimeter of a triangle is $6p^2 - 4p + 9$ and two of its sides are $p^2 - 2p + 1$ and $3p^2 - 5p + 3$. Find the third side of the triangle.

- (A) $8p^2 + 11p - 7$ (B) $2p^2 + 3p + 5$ (C) $3p^2 + 5p - 4$ (D) $5p^2 - 5p + 9$

28. Three lightships flash simultaneously at 6:00 a.m. The first lightship flashes every 12 seconds, the second lightship every 30 seconds and the third lightship every 66 seconds. At what time will the three lightships next flash together?

- (A) 6:09 a.m. (B) 6:10 a.m. (C) 6:11 a.m. (D) 6:12 a.m.

29. The points, whose abscissa and ordinate have different signs, lie in _____ quadrants.

- (A) I and II (B) II and III (C) I and III (D) II and IV

30. If each edge of a cube is increased by 50%, then the percentage increase in the surface area of the cube is

- (A) 125 (B) 50 (C) 100 (D) 150

31. The length of longest pole that can be placed on the floor of a room is 12 m and the length of longest pole that can be placed in the room slantingly is 15 m. The height of the room is

- (A) 3 m (B) 6 m (C) 9 m (D) 4 m

32. Two pipes X and Y can fill a cistern in 24 min. and 32 min. respectively. If both the pipes are opened together, then after how much time Y should be closed so that the tank is full in 18 minutes?

- (A) 6 mins (B) 8 mins (C) 10 mins (D) None of these

33. In a mixture of 60 liters, the ratio of milk and water is 2:1. If this ratio is to be 1:2, then the quantity of water to be further added is _____.

- (A) 20 liters (B) 80 liters (C) 40 liters (D) 60 liters

34. There are four bells. They ring after every one minute, two and half minutes, 50 seconds and 5 seconds respectively. If all the four bells rang last time together at 8:20 p.m., then at what time will they all next ring simultaneously?

- (A) 8:23 p.m. (B) 8:24 p.m. (C) 8:25 p.m. (D) 8:26 p.m.

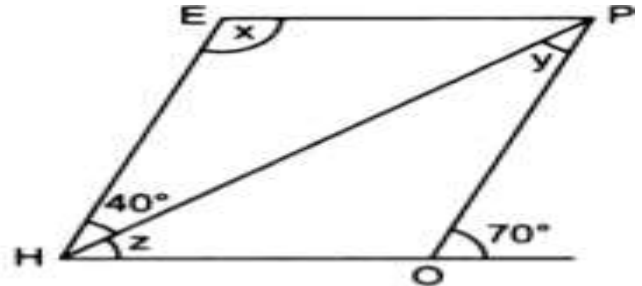
35. Number of zero of the zero polynomial is

- (A) 0 (B) 1 (C) 2 (D) Infinite

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36. The graph of line $y = 6$ is a line
 (A) Parallel to x-axis at a distance of 6 units from the origin.
 (B) Parallel to y-axis at a distance of 6 units from the origin.
 (C) Making an intercept of 6 units on the x-axis.
 (D) Making an intercept of 6 units on both the axis.

37. The adjacent figure HOPE is a parallelogram. The angle measures x , y and z respectively are



- (A) $110^\circ, 30^\circ, 40^\circ$ (B) $30^\circ, 40^\circ, 110^\circ$
 (C) $110^\circ, 40^\circ, 30^\circ$ (D) $30^\circ, 50^\circ, 100^\circ$

38. The volume of rectangle box with their length, breadth and height as xy , $2x^2y$, $2xy^2$ respectively is

- (A) $4x^2y^4$ (B) $4x^4y^4$ (C) $4x^3y^4$ (D) $4x^4y^3$

39. The sum of a number and its reciprocal is thrice the difference of the number and its reciprocal. The number is _____.

- (A) $\pm\sqrt{2}$ (B) $\pm\frac{1}{\sqrt{2}}$ (C) $\pm\sqrt{3}$ (D) Both (A) and (B)

40. The numbers $7.478478\dots$ and $1.101001000100001\dots$ is

- (A) Both irrationals (B) Both rational
 (C) Rational and irrational respectively (D) None of these

41. What is $\sqrt{-9} \times \sqrt{-9}$.

- (A) 9 (B) -9 (C) 3 (D) undefined

42. The difference between two numbers is 3, and their sum is 99. The smaller number of the two is

- (A) 24 (B) 45 (C) 48 (D) 11

43. Find the odd man out of 1050, 510, 242, 106, 46, 16, 3

- (A) 510. (B) 242. (C) 46. (D) 106.

44. Evaluate:
$$\frac{5^n + 3 - 6 \times 5^n + 1}{9 \times 5^n - 5^n \times 2^2}$$

- (A) 19 (B) 21 (C) 40 (D) 15

45. A well with 10 m inside diameter is dug 14m deep. Earth taken out of it is spread all around to a width of 5m to form an embankment. The height of the embankment is

- (A) 2.46m (B) 4.66m (C) 3.56m (D) 5.76m

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46. The students of Class VIII of a school donated Rs 2401 in all, for Prime Minister's National Relief Fund. Each student donated as many rupees as the number of students in the class. Find the number of students in the class.

- (A) 46 (B) 35 (C) 49 (D) 57

47. The digit in the ten's place of a two-digit number is 3 more than the digit in the unit's place. The number is

- (A) $11b + 3$ (B) $10 + b$ (C) $11b + 30$ (D) $10b + 3$

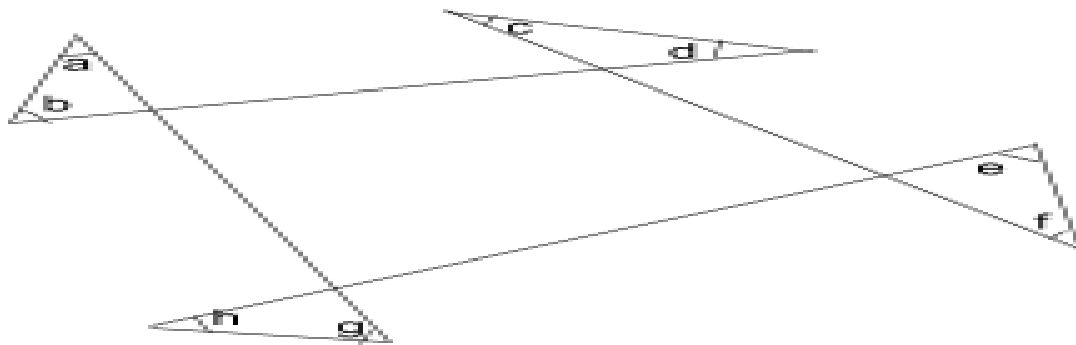
48. Which of the following figures is an equiangular and equilateral polygon?

- (A) Pentagon (B) Rectangle (C) Rhombus (D) Cuboid

49. Three numbers are in ratio 2:3:4 the sum of their cubes is 33957, the number?

- (A) 6 (B) 7 (C) 8 (D) 9

50. Find the sum of a, b, c, d, e, f, g and h.



- (A) 360° (B) 720° (C) 540° (D) 180°

Logical Reasoning

51. Look at this series: 7, 10, 8, 11, 9, 12, ... What number should come next?

- (A) 10 (B) 7 (C) 12 (D) 13

52. If MINJUR is coded as 312547 and TADA as 6898, then MADURAI is coded as

- (A) 3498178 (B) 3894871 (C) 3849781 (D) 3894781

53. Choose the pair that best represents a similar relationship to the one expressed in the original pair of words - RAIN : DRIZZLE

- (A) hop : shuffle (B) run : jog (C) swim : dive (D) walk : run

54. B_2CD , _____, BCD_4 , B_5CD , BC_6D . The missing pattern is

- (A) BC_3D (B) B_2C_2D (C) B_2C_3D (D) $B_2C_2D_2$

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55. The missing term in F2, ?, D8, C16, B32 is

- (A) D4 (B) E4 (C) E6 (D) G16

56. Identify the missing pattern of XXIV, XX, __, XII, VIII

- (A) XXII (B) XIII (C) XVI (D) XIV

57. Which word does NOT belong with the others?

- (A) peninsula (B) island (C) cape (D) bay

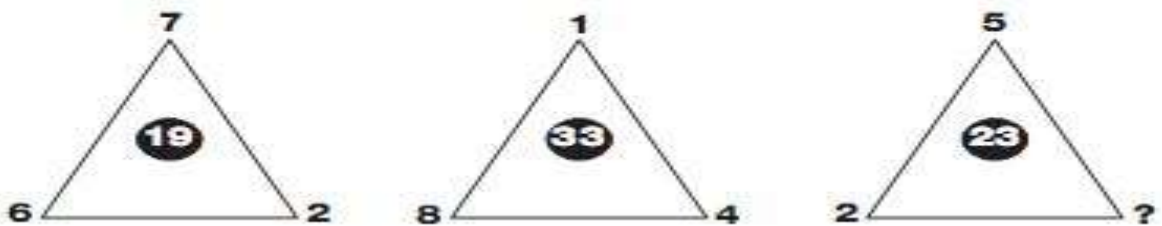
58. A four-person crew from Classic Colors is painting Mr. Field's house. Michael is painting the front of the house. Ross is in the alley behind the house painting the back. Jed is painting the window frames on the north side, Shawn is on the south. If Michael switches places with Jed, and Jed then switches places with Shawn, where is Shawn?

- (A) In the alley behind the house (B) On the north side of the house
(C) In front of the house (D) On the south side of the house

59. Four people witnessed a mugging. Each gave a different description of the mugger. Which description is probably right?

- (A) He was average height, thin, and middle-aged.
(B) He was tall, thin, and middle-aged.
(C) He was tall, thin, and young.
(D) He was tall, of average weight, and middle-aged.

60. Which number replaces the question mark?



- (A) 9 (B) 7 (C) 5 (D) 6

Science

61. The freezing and boiling points of a substance 'P' are -220°C and -185°C respectively. At which of the following range of temperatures will 'P' exist as a liquid?

- (A) Between -175°C and -210°C (B) Between -190°C and -225°C
(C) Between -200°C and -160°C (D) Between -195°C and -215°C