Model Half Yearly Examination

Time: 2.30 Hrs. **IX Standard – Mathematics** **Maximum Marks - 100**

PART – I (Marks - 14)

Note: Answer ALL the questions: - **14 x 1 = 14**

1. If $A=\{x, y, z\}$ then the number of non- empty subsets of A is

(A) 8 (B) 5 (C) 6 (D) 7

2. Which of the following is correct?

(A) $\varnothing \subseteq \{a,b\}$ (B) $\varnothing \in \{a,b\}$ (C) $\{a\} \in \{a,b\}$ (D) $a \subseteq \{a,b\}$

3. If $n(A)=10$ and $n(B)=15$, then the minimum and maximum number of elements in $A \cap B$ is

(A) 10, 15 (B) 15, 10 (C) 10, 0 (D) 0, 10

4. The length and breadth of a rectangular plot are 5×10^5 and 4×10^4 metres respectively. Its area is

(A) $9\times10^1\ m^2$ (B) $9\times10^9\ m^2$ (C) $2\times10^{10}\ m^2$ (D) $20\times10^{20}\ m^2$

5. $4\sqrt{7}\times2\sqrt{3}=$

(A) $6\sqrt{10}$ (B) $8\sqrt{21}$ (C) $8\sqrt{10}$ (D) $6\sqrt{21}$

6. If $\sqrt{9^x}=\sqrt[3]{9^2}$ then $x=$_____

(A) $\frac{2}{3}$ (B) $\frac{4}{3}$ (C) $\frac{1}{3}$ (D) $\frac{5}{3}$

7. Zeros of $(2-3x)$ is _____

(A) 3 (B) 2 (C) $\frac{2}{3}$ (D) $\frac{3}{2}$

8. If x^3+6x^2+kx+6 is exactly divisible by $(x+2)$ then $k=?$

(A) -6 (B) -7 (C) -8 (D) 11

9. Find the GCD of $x-y$ and x^2-y^2 is

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

10. If one angle of a cyclic quadrilateral is 125^0, then the opposite angle is

(A) 80^0 (B) 105^0 (C) 55^0 (D) 90^0

11. The mid-point of the line joining $(-a, 2b)$ and $(-3a, -4b)$ is

(A) $(2a, 3b)$ (B) $(-2a, -b)$ (C) $(2a, b)$ (D) $(-2a, -3b)$

12. If $\sin 30^0 = x$ and $\cos 60^0 = y$ then the value of $x^2 + y^2$

(A) $\frac{1}{2}$ (B) 0 (C) $\sin 90^0$ (D) $\cos 90^0$

13. The distance between the point $(5, -1)$ and the origin is _____

(A) $\sqrt{24}$ (B) $\sqrt{37}$ (C) $\sqrt{26}$ (D) $\sqrt{17}$

14. If $(x+2, 4) = (5, y-2)$ then the coordinates (x, y) are _____

(A) $(7, 12)$ (B) $(6, 3)$ (C) $(3, 6)$ (D) $(2, 1)$

PART – II (Marks - 20)

Note: Answer any 10 questions. Question Number 28 is compulsory: - 10 x 2 = 20

15. Write the set of letters of the following words in Roster form

(i) ASSESSMENT (ii) CZECHOSLOVAKIA

16. If $A = \{a, b, c\}$, write all the subsets of A.

17. If $n(A) = 36$, $n(B) = 10$ and $n(A \cup B) = 40$, then find $n(A \cap B)$

18. Convert the decimal number $0.\bar{3}$ in the form of $\frac{p}{q}$

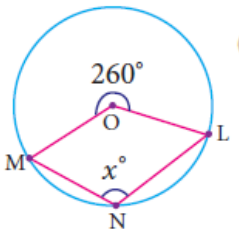
19. Find the value of $\left(\frac{64}{125}\right)^{\frac{-2}{3}}$

20. The mass of the Earth is 5.97×10^{24} kg and that of the Moon is 0.073×10^{24} kg. What is their total mass?

21. If $P(x) = 2x^3 + 6x^2 - 5x + 8$ and $Q(x) = 3x^3 - 2x^2 + 6x + 15$, then find the value of $p(x) - q(x)$

22. If $p(x) = x^2 - 2\sqrt{2}x + 1$ then, find $p(2\sqrt{2})$

23. Find the value of $x°$ in the figure



24. Find the mid-points of the line segment joining the points (a, b) and $(a+2b, 2a-b)$

25. In what ratio does the point $P(2, -5)$ divide the line segment joining $A(-3, 5)$ and $B(4, -9)$.

26. Find the centroid of the triangle whose veritices are $A(6, -1)$, $B(8, 3)$ and $C(10, -5)$

27. If $\operatorname{cosec} A = \sec 34^0$ then find the value of A.

28. What is the remainder when $x^{2018} + 2018$ is divided by $(x-1)$

PART – III (Marks - 50)

Note: Answer any 10 questions. Question Number. 42 is compulsory: - 10 x 5 = 50

29. Verify $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$, using Venn diagrams.

30. If $A = \{-2, 0, 1, 3, 5\}$, $B = \{-1, 0, 2, 5, 6\}$ and $C = \{-1, 2, 5, 6, 7\}$ then show that $A - (B \cap C) = (A - B) \cup (A - C)$.

31. In a colony, 275 families buy Tamil newspaper, 150 families buy English newspaper, 45 families buy Hindi newspaper, 125 families buy Tamil and English newspapers, 17 families buy English and Hindi newspapers, 5 families buy Tamil and Hindi newspapers and 3 families buy all the three newspapers. If each family buy atleast one of these newspapers then find

(i) Number of families buy only one newspaper

(ii) Number of families buy atleast two newspapers

(iii) Total number of families in the colony.

32. Arrange in ascending order $\sqrt[3]{2}$, $\sqrt[2]{4}$, $\sqrt[4]{3}$

33. Represent $\sqrt{9.3}$ on a number line.

34. If $x = \sqrt{5} + 2$, then, find the value of $x^2 + \frac{1}{x^2}$

35. Factories: $x^3 - 3x^2 - 10x + 24$

36. Solve $3x - 4y = 10$ and $4x + 3y = 5$ by the method of cross multiplication.

37. In a circle, AB and CD are two parallel chords with centre O and radius 10 cm such that $AB = 16$ cm and $CD = 12$ cm determine the distance between the two chords?

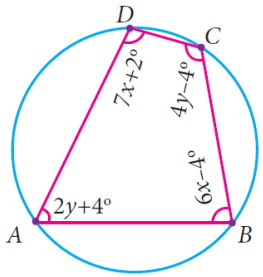
38. If $(x, 3)$, $(6, y)$, $(8, 2)$ and $(9, 4)$ are the vertices of a parallelogram taken in order, then find the value of x and y.

39. Show that $(4, 3)$ is the centre of the circle passing through the points $(9, 3)$, $(7, -1)$ and $(-1, 3)$. Also find its radius.

40. Find the area of the right-angled triangle with hypotenuse $5cm$ and one of the acute angle is $48^0\,30'$

41. Show that the points $A(7, 10)$, $B(-2, 5)$, $C(3, -4)$ are the vertices of a right-angled triangle.

42. Find all the angles of the given cyclic quadrilateral $ABCD$ in the figure.



PART - IV (Marks- 16)

Note: Answer ALL the questions: - **2 x 8 = 16**

43. (A). Construct the ΔPQR such that $PQ = 8$ cm, $QR = 6$ cm and $RP = 7$ cm. Locate its centroid.

OR

(B**).** Construct ΔPQR whose sides are PQ = 6cm, $\angle Q = 60^0$ and QR = 7cm and locate its orthocentre.

44. (A). Use graphical method to solve the following system of equations: $x + y = 7$ and $x - y = 3$

OR

(**B).** Draw the graph of $3x + 2y = 14$

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