

HALF YEARLY EXAMINATION - 2022

STD - IX

TIME : 3.00 Hrs

MATHS

MARKS : 100

PART - 1 (Marks 14) Note : Answer ALL the questions :

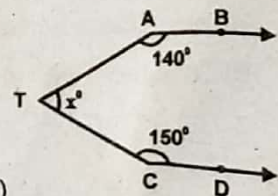
14 x 1 = 14

1. The set $P = \{x \mid x \in \mathbb{Z}, -1 < x < 1\}$ is a a) Singleton set b) Power set c) Null set d) Subset
2. For any three sets A, B and C, $(A-B) \cap (B-C)$ is equal to a) A only b) B only c) C only d) ϕ
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. $(\sqrt{5}-2)(\sqrt{5}+2)$ is equal to a) 1 b) 3 c) 23 d) 21
5. $0.\overline{34} + 0.\overline{34} = \dots\dots\dots$ a) $0.\overline{687}$ b) $0.\overline{68}$ c) $0.\overline{68}$ d) $0.\overline{687}$
6. If $\sqrt{9^x} = \sqrt[3]{9^2}$ then $x = \dots\dots\dots$ a) $\frac{2}{3}$ b) $\frac{4}{3}$ c) $\frac{1}{3}$ d) $\frac{5}{3}$
7. If $x^3 + 6x^2 + kx + 6$ is exactly divisible by $(x+2)$ then $k = ?$ a) -6 b) -7 c) -8 d) 11
8. Degree of the polynomial $(y^3-2)(y^3+1)$ is a) 9 b) 2 c) 3 d) 6
9. Find the GCD of $x^4 - y^4$ 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 100° , then the opposite angle is a) 80° b) 105° c) 85° d) 90°
11. If there is polygon of n sides ($n \geq 3$), then the sum of all interior angles is
a) $(n-1) 180^\circ$ b) $(n-2) 180^\circ$ c) $(n+2) 180^\circ$ d) $(n+1) 180^\circ$
12. The mid-point of the line joining $(-a, 2b)$ and $(-3a, -4b)$ is a) $(2a, 3b)$ b) $(-2a, -b)$ c) $(2a, b)$ d) $(-2a, -3b)$
13. The points $(-5, 2)$ and $(2, -5)$ lie in the
a) same quadrant b) II and III quadrants respectively
c) II and IV quadrants respectively d) IV and II quadrants respectively
14. The distance between the point $(5, -1)$ and the origin is a) $\sqrt{24}$ b) $\sqrt{37}$ c) $\sqrt{26}$ d) $\sqrt{17}$

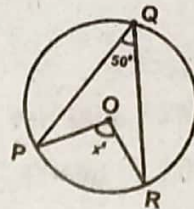
PART - II (Marks - 20) Note : Answer any 10 questions. Q. No. 28 is compulsory

10 x 2 = 20

15. Write the set of letters of the following words in Roster form. i) MISSISSIPPI ii) CZECHOSLOVAKIA
16. If $A = \{a, \{a, b\}\}$, write all the subsets of A.
17. If $A = \{b, d, e, g, h\}$ and $B = \{a, e, c, h\}$, then verify $n(A-B) = n(A) - n(A \cap B)$.
18. Convert the decimal number $0.\overline{45}$ 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. What should be added $2x^3 + 6x^2 - 5x + 8$ to get $3x^3 - 2x^2 + 6x + 15$?
22. If $p(x) = x^2 - 2\sqrt{2}x + 1$ then, find $p(2\sqrt{2})$
23. What is the remainder when $x^{2022} + 2022$ is divided by $(x-1)$
24. In the figure, AB is parallel to CD, find x°
25. Find the mid-points of the line segment joining the points (a, b) and $(a+2b, 2a-b)$
26. If the mid-point (x, y) of the line joining $(3, 4)$ and $(p, 7)$ lies on $2x + 2y + 1 = 0$, then what will be the value of p?



27. Find the centroid of the triangle whose vertices are $A(6, -1)$, $B(8, 3)$ and $C(10, -5)$
 28. Find the value of x^0 in the figure.



PART - III (Marks - 50)

Note : Answer any 10 questions. Q.No.42 is compulsory 10 x 5 = 50

29. Verify $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$, using Venn diagrams.
 30. If $A = \{b, c, e, g, h\}$, $B = \{a, c, d, g, i\}$ and $C = \{a, d, e, g, h\}$ 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 newspaper
 iii) Total number of families in the colony.

32. Represent $\sqrt{6.5}$ on a number line.

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

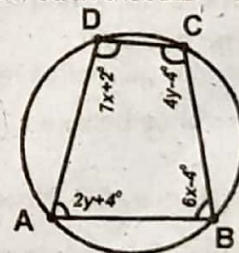
34. The length of a rectangle is $(3x+2)$ units and its breadth is $(3x-2)$ units. Find its area in terms of x . What will be the area if $x=20$ units.

35. Factories : $x^3 + 13x^2 + 32x + 20$

36. If the quotient obtained on dividing $x^4 + 10x^3 + 35x^2 + 50x + 29$ by $(x+4)$ is $x^3 - ax^2 + bx + 6$, then find a , b and also the remainder.

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

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



39. 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 .

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

41. Find the points which divide the line segment joining $A(-11, 4)$ and $B(9,8)$ into four equal parts.

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

PART - IV (Marks - 16) Note : Answer All the questions :

2 x 8 = 16

43. (A) Construct the $\triangle LMN$ such that $LM = 7.5\text{ cm}$, $MN = 5\text{ cm}$ and $LN = 8\text{ cm}$. Locate its centroid. (OR)
 (B) Construct $\triangle PQR$ whose sides are $PQ = 6\text{cm}$, $\angle Q = 60^\circ$ and $QR = 7\text{ cm}$ and locate its orthocentre.
 44. (A) Use graphical method to solve the following system of equations: $x+y=5$ and $2x-y=4$ (OR)
 (B) Draw the graph of $3x+2y=14$