

Standard 9 MATHEMATICS PART - I

Marks: 100

Time: 3.00 Hours

14x1=14**I. Choose the correct answer:**

- 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) If $A \cup B = A \cap B$ then
 - a) $A \neq B$
 - b) $A = B$
 - c) $A \subset B$
 - d) $B \subset A$
- 3) For any three sets A, B, C $(A-B) \cap (B-C)$ is equal to
 - a) \emptyset
 - b) C only
 - c) B only
 - d) A only
- 4) Which of the following is true?
 - a) $A - B = A \cap B$
 - b) $A - B = B - A$
 - c) $(A \cup B)' = A' \cup B'$
 - d) $(A \cap B)' = A' \cup B'$
- 5) Which one of the following is an Irrational number
 - a) $\sqrt{25}$
 - b) $\sqrt[3]{4}$
 - c) $\frac{7}{11}$
 - d) π
- 6) $0.\overline{34} + 0.\overline{34} = \dots\dots\dots$
 - a) $0.6\overline{87}$
 - b) $0.6\overline{8}$
 - c) $0.6\overline{8}$
 - d) $0.68\overline{7}$
- 7) $\sqrt{27} + \sqrt{12} = \dots\dots\dots$
 - a) $5\sqrt{3}$
 - b) $5\sqrt{6}$
 - c) $\sqrt{39}$
 - d) $3\sqrt{5}$
- 8) $(0.000729)^{-\frac{3}{4}} \times (0.09)^{-\frac{3}{4}} = \dots\dots\dots$
 - a) $\frac{10^3}{3^3}$
 - b) $\frac{10^6}{3^6}$
 - c) $\frac{10^5}{3^5}$
 - d) $\frac{10^2}{3^2}$
- 9) $2x + 3 = 0$ is the root of the polynomial equation
 - a) $\frac{-3}{2}$
 - b) $\frac{-2}{3}$
 - c) $\frac{1}{3}$
 - d) $\frac{-1}{3}$
- 10) If $P(a) = 0$ then $(x - a)$ is a of $P(x)$
 - a) Remainder
 - b) factor
 - c) quotient
 - d) Divisor
- 11) Find the value of m from the equation $2x + 3y = m$. If the solution is $x = 2$ and $y = -2$.
 - a) 10
 - b) 0
 - c) -2
 - d) 2
- 12) The exterior angle of a triangle is equal to the sum of two
 - a) Interior opposite angles
 - b) Alternative angles
 - c) Exterior angles
 - d) Interior angles
- 13) If $x^{40} + 40$ is divisible by $x + 1$, then the remainder is
 - a) 39
 - b) 40
 - c) -40
 - d) 41
- 14) For any set A

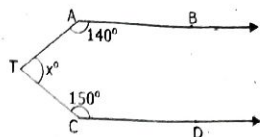
$A \cup A = A$ & $A \cap A = A$

 - a) Idempotent Laws
 - b) Identity Law
 - c) De Morgan's Law
 - d) Symmetric Law

PART - II**II. Answer any 10 questions: (Q.No. 28 is compulsory)****10x2=20**

- 15) Find the number of subsets and the number of proper subsets of a set $X = \{a, b, c, x, y, z\}$
- 16) $X = \{5, 6, 7\}$ $Y = \{5, 7, 9, 10\}$. Find the symmetric difference between the sets.
- 17) $A = \{b, e, f, g\}$ and $B = \{c, e, g, h\}$, then verify the commutative property of union of sets
- 18) If $n(A) = 25$, $n(B) = 40$ $n(A \cup B) = 50$ and $n(B') = 25$ find $n(A \cap B)$ and $n(U)$
- 19) Find any two rational number between $\frac{1}{2}$ and $\frac{2}{3}$
- 20) Express the following decimal expression into rational numbers $0.\overline{24}$
- 21) Give any two rational numbers lying between $0.5151151115 \dots$ and $0.5353353335 \dots$

- 22) Multiply $\sqrt[3]{40}$ and $\sqrt[3]{16}$
 23) Find the roots of the polynomial equation $5x - 3 = 0$
 24) Factorise : $8x^3 + 27y^3 + 64z^3 - 72xyz$
 25) The base of the parallelogram is $(5x + 4)$
 Find its height, if the area is $25x^2 - 16$.
 26) Evaluate $10^3 - 15^3 + 5^3$.
 27) In the figure AB is parallel to CD, find x.
 28) Find G.C.D ($y^3 + 1$) and ($y^3 - 1$).

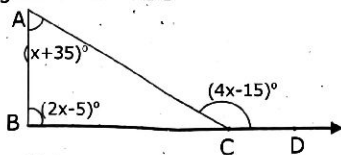


PART - III

III. Answer any 10 questions: (Q.No. 42 is compulsory)

10x5=50

- 29) Verify $(A \cup B)' = A' \cap B'$ Using Venn diagrams.
 30) In a group of 100 students, 85 students speak Tamil, 40 students speak English, 20 students speak French, 32 speak Tamil and English, 13 speak English and French and 10 speak Tamil and French. In each student knows atleast any one of these languages then find the number of students who speak all these three languages.
 31) If $A = \{0, 2, 4, 6, 8\}$ $B = \{x : x \text{ is a prime number and } x < 11\}$ and $C = \{x : x \in \mathbb{N} \text{ and } 5 \leq x < 9\}$ then verify $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
 32) If $A = \{x : x = 6n, n \in \mathbb{W} \text{ and } n < 6\}$ $B = \{x : x = 2n, n \in \mathbb{N} \text{ and } 2 < n \leq 9\}$ and $C = \{x : x = 3n, n \in \mathbb{N} \text{ and } 4 \leq n < 10\}$ then show that $A - (B \cap C) = (A - B) \cup (A - C)$
 33) Convert the decimal numbers in the form of $\frac{p}{q}$ ($p, q \in \mathbb{Z}$ and $q \neq 0$) $0.\overline{568}$
 34) Represent $3.\overline{45}$ on the number line upto 4 decimal places.
 35) Arrange in ascending order: $\sqrt[3]{2}, \sqrt[3]{4}, \sqrt[3]{3}$
 36) Simplify: $(7\sqrt{a} - 5\sqrt{b})(7\sqrt{a} + 5\sqrt{b})$
 37) If $(y - \frac{1}{y})^3 = 27$ then find the value of $y^3 - \frac{1}{y^3}$
 38) Find quotient and the remainder when $f(x)$ is divided by $g(x)$
 i) $f(x) = (8x^3 - 6x^2 + 15x - 7)$ $g(x) = 2x + 1$.
 39) Is $(3x - 2)$ a factor of $3x^3 + x^2 - 20x + 12$?
 40) If the quotient on dividing $x^4 + 10x^3 + 35x^2 + 50x + 29$ by $(x + 4)$ is $x^3 - ax^2 + bx + 6$, then find the value of a, b and also remainder.
 41) Find all the three angles of the ΔABC



- 42) Expand : $(x - 12)(x + 7)(x - 18)$

PART - IV

IV. Answer both questions:

2x8=16

- 43) a) Draw the ΔABC where $AB = 6\text{cm}$ $\angle B = 110^\circ$ and $AC = 9\text{cm}$ and construct the centroid.

(OR)

- b) Draw an equilateral triangle of sides 6.5cm and locate its Orthocentre.

- 44) a) Let $U = \{0, 1, 2, 3, 4, 5, 6, 7\}$ $A = \{1, 3, 5, 7\}$ and $B = \{0, 2, 3, 5, 7\}$ find the following sets i) A' ii) B' iii) $A \cup B'$ iv) $A' \cap B'$ v) $(A \cup B)'$ vi) $(A \cap B)'$ vii) $(A)'$ viii) $(B)'$

(OR)

- b) Factorise the following:

i) $x^2 + 10x + 24$

iii) $2a^2 + 9a + 10$

ii) $a^2 + 10a - 600$

iv) $5x^2 - 29xy - 42y^2$