



Standard 9 MATHEMATICS Part - A

Time: 3.00 Hours

Marks: 100

Note: i) Answer all the questions.
ii) Choose the suitable answer from the four given alternative and write the correct option.

- 14x1=14**
- 1) If $B \subseteq A$ then $n(A \cap B)$ is
a) $n(A - B)$ b) $n(B)$ c) $n(B - A)$ d) $n(A)$
- 2) Which of the following is correct?
a) $\emptyset \subseteq \{a, b\}$ b) $\emptyset \in \{a, b\}$ c) $\{a\} \in \{a, b\}$ d) $a \subseteq \{a, b\}$
- 3) For any three sets P, Q and R, $P - (Q \cap R)$ is
a) $P - (Q \cup R)$ b) $(P \cap Q) - R$
c) $(P - Q) \cup (P - R)$ d) $(P - Q) \cap (P - R)$
- 4) 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) \emptyset
- 5) If 'n' is a natural number then \sqrt{n} is
a) always a natural number b) always an irrational number
c) always a rational number d) may be rational or irrational
- 6) If $\frac{1}{7} = 0.142857$ then the value of $\frac{5}{7}$ is
a) 0.142857 b) 0.714285 c) 0.571428 d) 0.714285
- 7) Which of the following statement is false?
a) The squareroot of 25 is 5 or -5 b) $+\sqrt{25} = +5$
c) $-\sqrt{25} = -5$ d) $\sqrt{25} = \pm 5$
- 8) The length and breadth of a rectangular plot are 5×10^5 and 4×10^4 metres respectively. Its area is
a) $9 \times 10^1 \text{ m}^2$ b) $9 \times 10^9 \text{ m}^2$ c) $2 \times 10^{10} \text{ m}^2$ d) $20 \times 10^{20} \text{ m}^2$
- 9) Identify a rational number among the following numbers
a) $2 + \sqrt{2}$ b) $2\sqrt{2}$ c) 0 d) π
- 10) The root of the polynomial equation $2x + 3 = 0$ is
a) $\frac{1}{3}$ b) $-\frac{1}{3}$ c) $-\frac{3}{2}$ d) $-\frac{2}{3}$
- 11) $(x + y)(x^2 - xy + y^2)$ is equal to
a) $(x + y)^3$ b) $(x - y)^3$ c) $x^3 + y^3$ d) $x^3 - y^3$
- 12) Find the value of m from the equation $2x + 3y = m$. If its one solution is $x = 2$ & $y = -2$
a) 2 b) -2 c) 10 d) 0
- 13) If $(y - 3)$ is a factor of $p(y)$ then $(_) = 0$
a) -3 b) 3 c) 0 d) 1
- 14) The exterior angle of a triangle is equal to the sum of two
a) Exterior angles b) Interior opposite angles
c) Alternate angles d) Interior angles

Part - B

II. Do any 10 sums: (Q.No: 28 is compulsory)

10x2=20

- 15) Are $A = \{x : x \in N, 4 \leq x \leq 8\}$ and $B = \{4, 5, 6, 7, 8\}$ equal sets?
- 16) Write all the subsets of $A = \{a, b\}$
- 17) Let $A = \{b, d, e, g, h\}$ and $B = \{a, e, c, h\}$ find $n(A - B)$ and $n(A \cap B)$
- 18) If $P = \{1, 2, 5, 7, 9\}$, $Q = \{2, 3, 5, 9, 11\}$ and $R = \{3, 4, 5, 7, 9\}$ then find $(P \cup Q) \cap R$
- 19) Find any two rational numbers between $\frac{1}{2}$ and $\frac{2}{3}$
- 20) Find whether x and y are rational or irrational if $a = 2 + \sqrt{3}$, $b = 2 - \sqrt{3}$, $x = a + b$, $Y = a - b$.
- 21) Find the value of $(243)^{\frac{2}{5}}$
- 22) Simplify : $5\sqrt{3} + 18\sqrt{3} - 2\sqrt{3}$

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- 23) Write the polynomial $y^2 + \sqrt{5}y^3 - 11 - \frac{7}{3}y + 9y^4$ in standard form.
- 24) Factorise : $2x^2 + 15x - 27$
- 25) Find the remainder when $3x^3 - 4x^2 + 7x - 5$ is divided by $(x + 3)$
- 26) Find the G.C.d of $a^3 - 9ax^2$, $(a - 3x)^2$.
- 27) The angles of a triangle are in the ratio 1:2:3, find the measure of each angle of the triangle.
- 28) If $n[P(A)] = 256$, then find $n(A)$.

Part - C

III. Do any 10 sums: (Q.No: 42 is compulsory)

10x5=50

- 29) If $U = \{0, 1, 2, 3, 4, 5, 6, 7\}$, $A = \{1, 3, 5, 7\}$ and $B = \{0, 2, 3, 5, 7\}$ then find the following sets. (i) A' (ii) B' (iii) $A \cup B'$ (iv) $A' \cap B'$ (v) $(A \cup B)'$
- 30) 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 $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
- 31) Verify $(A \cup B)' = A' \cap B'$ using Venn diagrams.
- 32) Each student in a class of 35 plays atleast one game among chess, carrom and table tennis 22 play chess, 21 play carrom, 15 play table tennis, 10 play chess and table tennis, 8 play carrom and table tennis and 6 play all the three games. Find the number of students who play
(i) Chess and Carrom but not table tennis (ii) Only chess
(iii) Only carrom (Hint: Use Venn diagram)
- 33) Represent $\sqrt{9.3}$ on a number line
- 34) If $\sqrt{2} = 1.414$, $\sqrt{3} = 1.732$, $\sqrt{5} = 2.236$, $\sqrt{10} = 3.162$ then find the value of $\sqrt{300} + \sqrt{90} - \sqrt{8}$ correct to 3 places of decimals.
- 35) If $x = \sqrt{5} + 2$, then find the value of $x^2 + \frac{1}{x^2}$
- 36) Represent $(300000)^2 \times (20000)^4$ in scientific notation.
- 37) Evaluate $10^3 - 15^3 + 5^3$ using identities.
- 38) If $a + \frac{1}{a} = 6$ then find the value of $a^2 + \frac{1}{a^2}$
- 39) If the quotient obtained on dividing $3x^3 + 11x^2 + 34x + 106$ by $(x-3)$ is $3x^2 + ax + b$ then find a , b and also the remainder.
- 40) Factorise $x^3 - 5x^2 - 2x + 24$

Find all the three angles of the ΔABC

- 42) Rationalise the denominator of $\frac{5 + \sqrt{3}}{5 - \sqrt{3}}$

Part - D

IV. Answer all questions:

2x8=16

- 43) a) Construct the centroid of ΔPQR whose sides are $PQ = 8\text{cm}$, $QR = 6\text{cm}$ and $RP = 7\text{cm}$.
(OR)
b) Draw an equilateral triangle of sides 6.5cm and locate its orthocentre.
- 44) a) Construct the circumcentre of the ΔABC with $AB = 5\text{cm}$, $\angle A = 60^\circ$ and $\angle B = 80^\circ$. Also draw the circumcircle and find the circumradius of the ΔABC .
(OR)
b) Construct ΔABC in which $AB = BC = 6\text{cm}$ and $\angle B = 80^\circ$. Locate its incentre and draw the incircle.