

15E(A)

MATHEMATICS, Paper - I

(English version)

(Parts A and B)

Time : 2 hrs. 45 min.]

[Maximum Marks : 40

Instructions :

1. In the time duration of 2 hours 45 minutes, 15 minutes of time is allotted to read and understand the Question paper.
2. Answer **all** the questions under **Part-A** on a separate answer book.
3. Write the answers to the questions under **Part-B** on the Question paper itself and attach it to the answer book of **Part-A**.

Part - A

Time : 2 hours

Marks : 35

NOTE : (i) Answer **all** the questions from the given **three** sections **I, II and III** of **Part -A**.

(ii) In section III, every question has internal choice.

SECTION - I

(Marks : $7 \times 1 = 7$)

NOTE : (i) Answer **all** the following questions.

(ii) Each question carries 1 mark.

1. If $A = \{x : x \text{ is a factor of } 24\}$, then find $n(A)$.

2. Find the HCF of 24 and 33 by using division algorithm.

3. Radha says "1, 1, 1, are in A.P. and also in G.P.". Do you agree with Radha ? Give reason.
4. If $P(x) = x^4 + 1$, then find $P(2) - P(-2)$.
5. Find the roots of the Quadratic equation $x^2 + 2x - 3 = 0$.
6. Find the centroid of a ΔPQR , whose vertices are $P(1, 1)$, $Q(2, 2)$, $R(-3, -3)$.
7. For what value of 't' the following pair of linear equations has a no solution ?
 $2x - ty = 5$ and $3x + 2y = 11$

SECTION - II

(Marks : $6 \times 2 = 12$)

NOTE : (i) Answer *all* the following questions.

(ii) Each question carries 2 marks.

8. If $\mu = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, $A = \{2, 3, 5, 8\}$ and $B = \{0, 3, 5, 7, 10\}$. Then represent $A \cap B$ in the Venn diagram.
9. Akhila says, "points $A(1, 3)$, $B(2, 2)$, $C(5, 1)$ are collinear". Do you agree with Akhila ? Why ?
10. Write the Quadratic equation, whose roots are $2 + \sqrt{3}$ and $2 - \sqrt{3}$.
11. Divide $x^3 - 4x^2 + 5x - 2$ by $x - 2$.
12. Write the formula of n^{th} term of G.P. and explain the terms in it.
13. Solve the pair of linear equations $2x + 3y = 8$ and $x + 2y = 5$ by Elimination method.

- NOTE :** (i) Answer **all** the following questions.
(ii) In this section, every question has internal choice.
(iii) Answer **any one** alternative.
(iv) Each question carries 4 marks.

14. (a) Draw the graph of the polynomial $p(x) = x^2 - 7x + 12$, then find its zeroes from the graph.

OR

- (b) Solve the equations graphically $3x + 4y = 10$ and $4x - 3y = 5$.

15. (a) Find the ratio in which X-axis divides the line segment joining the points $(2, -3)$ and $(5, 6)$. Then find the intersecting point on X-axis.

OR

- (b) Find the sum of all two digit odd multiples of 3.

16. (a) If $A = \{x : 2x + 1, x \in \mathbb{N}, x \leq 5\}$,

$$B = \{x : x \text{ is a composite number, } x \leq 12\},$$

then show that $(A \cup B) - (A \cap B) = (A - B) \cup (B - A)$.

OR

- (b) Prove that $\sqrt{2} + \sqrt{7}$ is an irrational number.

17. (a) Sum of the areas of two squares is 850 m^2 . If the difference of their perimeters is 40 m. Find the sides of the two squares.

OR

- (b) Sum of the present ages of two friends are 23 years, five years ago product of their ages was 42. Find their ages 5 years hence.
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