

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  $\Delta PQR$ , 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  $n^{\text{th}}$  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  $850 \text{ m}^2$ . 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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