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 × 1 = 7)*

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

       (ii)   *Each question carries 1 mark.*

1. If $A = \{x : x$ 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 $\triangle PQR$, 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 : 6×2=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 nth 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.

15E(A)   [2]

N

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 $A = \{x : 2x + 1, x \in N, x \le 5\}$,

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

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.

_____