This Question Paper contains 4 Printed Pages.]

15E(A)

MATHEMATICS, Paper – I

(English version)

Parts A and B

Time : 2½ Hours] ***[Maximum Marks : 50***

Instructions :

1. *Answer the questions under* ***Part-A*** *on a separate answer book.*
2. *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**

SECTION - I *(Marks : 5×2=10)*

Note :

1. Answer **ANY FIVE** questions, choosing atleast **TWO** from each of the following **Groups**, i.e., **A** and **B** .
2. Each question carries **2** marks.

GROUP - A

(Real numbers, Sets, Polynomials, Quadratic Equations)

1. Expand $\log \frac{343}{125}$.

2. Draw the Venn diagrams of the sets (A – B), (B – A).

3. Find a quadratic polynomial, if the zeroes of it are 2 and –1 respectively.

4. Find the roots of the equation $2x^2 + x - 6 = 0$ by factorisation.

GROUP - B

(Pair of Linear equations in two variables, Progressions, Co-ordinate Geometry)

5. 10 students of class X took part in a mathematics quiz. If the number of girls is four more than the number of boys; then find the number of boys and the number of girls, who took part in the quiz.

6. Find the number of terms in the following AP

7, 13, 19, ..., 205

7. Find the coordinates of the point, which divides the join of (–1, 7) and (4, –3) in the ratio 2 : 3 .

8. Find the area of the triangle, whose vertices are (2, 0), (1, 2), (–1, 6).

What do you observe ?

SECTION - II

(Marks : 4×1=4)

Note :

1. Answer **ANY FOUR** of the following **SIX** questions.
2. Each question carries **1** mark.

9. Find the value of $\log_{81} 3$.

10. List all the subsets of the following set B = $\{p, q\}$.

11. Write the following set $\{x : x = 2n + 1 \text{ and } n \in N\}$ in roster form.

12. If $p(x) = x^2 - 5x - 6$; find the value of $p(3)$.

13. Find the common ratio of GP

2, $2\sqrt{2}$, 4, ...

14. Find the mid point of the line segment joining the points (2, 7) and (12, –7).

SECTION - III

(Marks : 4×4=16)

Note :

1. Answer **ANY FOUR** questions, choosing atleast **TWO** from each of the following **Groups**, i.e., **A** and **B**.
2. Each question carries **4** marks.

GROUP - A

(Real Numbers, Sets, Polynomials, Quadratic Equations)

15. Show that $5-\sqrt{3}$ is irrational.

16. If A = {1, 2, 3, 4}, B = {1, 2, 3, 5, 6}, then find *(i)* $A \cap B$, *(ii)* $B \cap A$, *(iii)* $A - B$, *(iv)* $B - A$, and what do you observe?

17. Find the zeroes of the polynomial $p(x) = x^2 - 4x + 3$ and verify the relationship between zeroes and coefficients.

18. Solve the quadratic equation $2x^2 + x - 4 = 0$ by completing the square.

GROUP - B

(Pair of Linear equations in two variables, Progressions, Co-ordinate Geometry)

19. Solve the equations.

$$\frac{10}{x+y} + \frac{2}{x-y} = 4, \quad \frac{15}{x+y} - \frac{5}{x-y} = -2$$

20. Solve the pair of equations by Elimination method.

$2x + y - 5 = 0, \quad 3x - 2y - 4 = 0$

21. If the sum of the first 7 terms of an AP is 49 and that of 17 terms is 289; find the sum of the first n terms.

22. Find the area of the triangle formed by joining the mid points of the sides of the triangle, whose vertices are (0, –1); (2, 1) and (0, 3). Find the ratio of this area to the area of the given triangle.

SECTION - IV

(Marks : 1×5=5)

(Polynomials, Pair of Linear equations in two variables)

Note :

1. Answer **ANY ONE** question from the following.
2. This question carries **5** marks.

23. Draw the graph of $p(x) = x^2 + 3x - 4$ and find zeroes.

Verify the zeroes of the polynomials.

24. Solve the following equations graphically.

$3x - y = 7$,

$2x + 3y = 1$
