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.

$3x - y = 7$,

$2x + 3y = 1$

This Question Paper contains 4 Printed Pages.

15E(B)

MATHEMATICS, Paper – I

(English version)

Parts A and B

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

Instructions :

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 - B

Time : 30 minutes ***Marks : 15***

Note :

1. Each question carries ½ mark.
2. Answers are to be written in the Question paper only.
3. Answer **all** the questions.
4. Marks will **not** be awarded in case of any over-written, re-written or erased answers.

I. *Write the CAPITAL LETTER showing the correct answer for the following questions in the brackets provided against them.* $10 \times ½ = 5$

1. If p is prime, then $\sqrt{p}$ is ..... [ ]

(A) Composite number (B) Rational number

(C) Positive integer (D) Irrational number

2. Exponential form of $\log_4 8 = x$ is ..... [ ]

(A) $x^8 = 4$ (B) $x^4 = 8$

(C) $4^x = 8$ (D) $8^x = 4$

3. If $\log 625 = k \log 5$, then the value of k is ..... [ ]

(A) 5 (B) 4

(C) 3 (D) 2

4. $\frac{p}{q}$ form of 0.0875 is ..... [ ]

(A) $\frac{7}{2^4 \times 5}$ (B) $\frac{7}{2 \times 5^4}$

(C) $\frac{7}{2^4 \times 5^4}$ (D) $\frac{5^3 \times 7}{2^3 \times 5^4}$

5. If $A \subset B$, $n(A) = 5$ and $n(B) = 7$, then $n(A \cup B) =$ ..... [ ]

(A) 5 (B) 7

(C) 2 (D) 12

6. If 2 and 3 are two zeroes of $x^3 - 5x^2 + 6x$,

then find the third zero .... [ ]

(A) 1 (B) 4

(C) 5 (D) 0

7. Which is not a linear equation of the following ? [ ]

(A) $5 + 4x = y + 3$

(B) $x + 2y = y - x$

(C) $3 - x = y^2 + 4$

(D) $x + y = 0$

8. Two angles are complementary. If the larger angle is twice the measure of a smaller angle, then smaller is ..... [ ]

(A) 30° (B) 45°

(C) 60° (D) 15°

9. The common difference of AP 1, –1, – 3, ... is ..... [ ]

(A) –1 (B) +2

(C) –2 (D) +1

10. Distance between (0, 7) and (–7, 0) is ..... [ ]

(A) $2\sqrt{7}$ (B) $7\sqrt{2}$

(C) $\sqrt{14}$ (D) +1

II. *Fill in the blanks with suitable answers.* $10 \times \frac{1}{2} = 5$

11. Decimal form of $\frac{36}{2^3 \times 5^3}$ value is .....

12. If L.C.M. and H.C.F. of two numbers are 108 and 9 respectively and one of them is 54; then other number is .....

13. If $\log_2 x = 3$, then $x =$ .....

14. If $\frac{52}{160} = \frac{13}{2^n \times 5^m}$, then $m + n =$ .....

15. If the polynomial $p(x) = x^2 - 8x + k$ is divided by $(x - 1)$, the remainder comes out to be '6', then k is .....

16. The discriminant of the Quadratic equation $px^2 + qx + r = 0$ is .....

17. The first negative number of AP; 14, 11, 8, ... is ..... term.

18. Intersecting point of $x + y = 6$, $x - y = 4$ is .....

19. (– 2, 8) point lies on ..... quadrant.

20. Slope of Y - axis is .....

III. *Find the correct answer for the questions given under* ***Group-A*** *selecting them from* ***Group-B*** *and write the indicating letter in the brackets provided against each question.* $10 \times \frac{1}{2} = 5$

(i)

Group - A		**Group - B**
21. The zero of linear polynomial $ax - b =$	[ ]	(A) 0
22. If the product of zeroes is '0' of the polynomial $ax^2 + bx + c$, then the value of c is	[ ]	(B) -2
23. Product of the zeroes of the polynomial $2x^2 - 3x + 6$ is	[ ]	(C) $\frac{b}{a}$
24. Sum of the zeroes of the polynomial $bx^2 + ax + c$ = ...	[ ]	(D) $\frac{a}{b}$
25. α, β, γ are the zeroes of the polynomial $x^3 + 3x^2 - x + 2$, then $\alpha\beta\gamma$ is	[ ]	(E) 2
		(F) $-\frac{a}{b}$
		(G) $-\frac{b}{a}$
		(H) 3

(ii)

Group - A		**Group - B**
26. Distance between X-axis and $(-4, 3)$ is	[ ]	(I) $\sqrt{5}$
		(J) (1, 1)
27. Distance between origin and $(2, 3)$ is	[ ]	(K) 3
28. Distance between Y-axis and $(4, 0)$ is	[ ]	(L) 2
		(M) 4
29. Mid point of line joining the points $(2, 3)$ and $(-2, 3)$ = ...	[ ]	(N) $\sqrt{13}$
30. Centroid of a triangle, whose vertices are $(0, 3)$; $(3, 0)$; $(0, 0)$ is	[ ]	(O) (0, 0)
		(P) (0, 3)