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 at least **TWO** from each of the following i.e., Groups **A** and **B** .
2. Each question carries **2** marks.

GROUP - A

(Real numbers, Sets, Polynomials, Quadratic Equations)

1. Explain why $7\times11\times13+13$ and $7\times6\times5\times4\times3\times2\times1+5$ are composite numbers.

2. If $A = \{0, 2, 4\}$; find $A \cap \phi$ and $A \cap A$. Comment.

3. Find the zeroes of polynomial $x^2 - 3$.

4. Find two consecutive odd positive integers, sum of whose squares is 290.

GROUP - B

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

5. What is meant by consistent equations ? Give example.

6. Find the number of terms in the following A.P.

7, 13, 19, ..., 205.

7. In what ratio does the point (– 4, 6) divide the line segment joining the points A(– 6, 10) and B(3, – 8) ?

8. Find a relation between x and y such that the point (x, y) is equidistant from the points (7, 1) and (3, 5).

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 $\log_{10} 0.001$.

10. Write the set builder form of {1, 4, 9, 16, 25, ... 100}.

11. Give any two examples of disjoint sets from your daily life.

12. Find the Quadratic polynomial with zeroes – 2 and $\frac{1}{3}$.

13. Find x so that x, $x + 2$, $x + 6$ are consecutive terms of Geometric Progression.

14. What do you mean by centroid of a triangle ?

SECTION - III

(Marks : 4×4=16)

Note :

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

GROUP - A

(Real number, Sets, Polynomials, Quadratic Equations)

15. Prove that $\sqrt{2}+\sqrt{3}$ is irrational.

16. If $A=\{x : x \text{ is natural number}\}$, $B=\{x : x \text{ is an even natural number}\}$, $C=\{x : x \text{ is an odd natural number}\}$, then find $A \cap B$, $A \cap C$, $A-B$, $A-C$ and describe sets in set builder form.

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

18. Find the roots of the equation $5x^2 - 7x - 6 = 0$ by the method of completing the square.

GROUP - B

(Linear equations in two variables, progression and co-ordinate Geometry)

19. Solve the equations by reducing them to a pair of linear equations.

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

20. Solve the following pair of equations by eliminating method.

$2x + y - 5 = 0$,

$3x - 2y - 4 = 0$

21. The fourth term of Geometric Progression is $\frac{2}{3}$ and the seventh term is $\frac{16}{81}$. Find the Geometric Progression.

22. If A and B are $(-2, -2)$ and $(2, -4)$ respectively. Find the co-ordinates of P such that $AP = \frac{3}{7} AB$ and P lies on the line segment AB.

SECTION - IV

(Marks : 1×5=5)

(Polynomials, 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 $y = 6 - x - x^2$ and find zeroes.

What do you notice ?

24. Solve the pair of linear equations graphically.

$2x + y - 5 = 0$,

$3x - 2y - 4 = 0$

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. **All** questions are to be answered.
4. Marks will **not** be given for 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. $\frac{3}{8}$ is ..... [ ]

(A) non terminating decimal.

(B) Terminating decimal.

(C) non-terminating, repeating decimal.

(D) none.

2. If $a\sqrt{c} = \sqrt{ac}$, then ..... (a, c are positive integers) [ ]

(A) $a = 1$ (B) $a = c$

(C) $c = 1$ (D) $a = -1$

3. $9 - 0.\bar{9} =$ ..... [ ]

(A) $8.\bar{1}$ (B) 8.1

(C) 8 (D) $0.\bar{1}$

4. If $A \subset B$, then $A \cap B =$..... [ ]

(A) A

(B) B

(C) ϕ

(D) μ

5. If $p(x) = x^2 - ax - 3$ and $p(2) = -3$, then $a =$ ..... [ ].

(A) 2 (B) -2

(C) 3 (D) -3

6. Product of the zeroes of $p(x) = (x-2)(x+3)$ is ..... [ ]

(A) -6 (B) 1

(C) -1 (D) 6

7. The graph $y = ax + b$ is a straight line which intersects X-axis at [ ]

(A) $\left(0, -\frac{b}{a}\right)$ (B) $(0, b)$

(C) $\left(-\frac{b}{a}, 0\right)$ (D) $(b, 0)$

8. If one root of $2x^2 + kx - 6$ is 2, then $k =$ ..... [ ]

(A) 3

(B) 4

(C) 1

(D) -1

9. In an AP $a_n = \frac{5n-3}{4}$, then a_7 = ... [ ]

(A) 8 (B) 10

(C) 9 (D) 7

10. A line makes 45° with X-axis, then its slope is ..... [ ]

(A) 1 (B) 0

(C) 2 (D) -1

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

11. The pair of lines represented by $2x - ky + 3 = 0$; $4x + 6y - 5 = 0$ are parallel if k = ...

12. If p is a prime number, then $\sqrt{p}$ is .....

13. $(3+\sqrt{2})\,(3-\sqrt{2})$ = ...

14. ..... is neither a composite nor a prime number.

15. The mathematician who developed set theory is .....

16. On graph, $y = x^2$ represent a .....

17. A cubic polynomial can have at the most ..... zeroes.

18. If $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$, the pair of linear equations is .....

19. If a, b, c are in G.P., then $\frac{a}{b}$ = ...

20. Herons formula for area of a triangle is .....

III. *Find the correct answer for the questions given under* ***Group-A*** *selecting the 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. $\log \frac{x^2}{y} =$	[ ]	(A) $\frac{1}{4}$
22. H.C.F. of 72 and 108 is	[ ]	(B) Infinite sets
23. $\log_{81}^{3} =$	[ ]	(C) $b^2 = 4\,ac$
24. If $A \cap B = \phi$, then A, B are called	[ ]	(D) $2 \log x - \log y$
25. If the roots of $ax^2 + bx + c = 0$ are equal, then	[ ]	(E) 36
		(F) 72
		(G) Disjoint sets

(ii)

Group - A		**Group - B**
26. General form of linear equation	[ ]	(H) 256
		(I) (9, 5)
27. The solution of $x + y = 14$ and $x - y = 4$ is	[ ]	(J) $ax^2 + bx + c$
28. In 8, 16, 32, ... 6th term is	[ ]	(K) Q_2
29. If $x > 0$ and $y < 0$, then the point (x, y) lies in ..... quadrant	[ ]	(L) $ax + by + c = 0$
		(M) (3, 6)
30. If A, B, C are collinear, then area of ΔABC = ...	[ ]	(N) Q_4
		(O) 0