

This Question Paper contains 4 Printed Pages.

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 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 answers book of **Part-A**.

Part - A

Time : 2.00 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.
Answer **any one** alternative.

SECTION - I

(Marks : $7 \times 1 = 7$)

- NOTE :** (i) Answer **all** the following questions.
(ii) Each question carries **1** mark.

1. Find the distance between the points (1, 5) and (5, 8).
2. Expand $\log_{10} 385$.

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3. Give one example each for a finite set and an infinite set.
4. Find sum and product of roots of the Quadratic equation.

$$x^2 - 4\sqrt{3}x + 9 = 0$$
5. Is the sequence $\sqrt{3}, \sqrt{6}, \sqrt{9}, \sqrt{12}, \dots$ form an Arithmetic Progression?
Give reason.
6. If $x = a$ and $y = b$ is solution for the pair of equations $x - y = 2$ and $x + y = 4$, then find the values of a and b .
7. Verify the relation between zeroes and coefficients of the Quadratic polynomial $x^2 - 4$.

SECTION - II

(Marks : $6 \times 2 = 12$)

- NOTE :** (i) Answer **all** the following questions.
 (ii) Each question carries **2** marks.

8. Complete the following table for the polynomial

$$y = p(x) = x^3 - 2x + 3.$$

x	-1	0	1	2
x^3				
$-2x$				
3				
y				
(x, y)				

9. Show that $\log \frac{162}{343} + 2 \log \frac{7}{9} - \log \frac{1}{7} = \log 2$

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10. If the equation $kx^2 - 2kx + 6 = 0$ has equal roots, then find the value of k .
11. Find the 7th term from the end of the Arithmetic Progression
7, 10, 13,, 184.
12. In the diagram on a Lunar eclipse, if the positions of Sun, Earth and Moon are shown by $(-4, 6)$, $(k, -2)$ and $(5, -6)$ respectively, then find the value of k .
13. Given the linear equation $3x + 4y = 11$, write linear equations in two variables such that their geometrical representations form parallel lines and intersecting lines.

SECTION - III

(Marks : $4 \times 4 = 16$)

NOTE :

1. Answer **all** the following questions.
2. In this section, every question has internal choice.
3. Answer **any one** alternative.
4. Each question carries **4** marks.

14. Find the points of tri-section of the line segment joining the points $(-2, 1)$ and $(7, 4)$.

OR

Sum of squares of two consecutive even numbers is 580. Find the numbers by writing a suitable Quadratic equation.

15. Prove that $\sqrt{3} + \sqrt{5}$ is an irrational number.

OR

Show that cube of any positive integer will be in the form of $8m$ or $8m + 1$ or $8m + 3$ or $8m + 5$ or $8m + 7$, where m is a whole number.

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16. Find the solution of $x + 2y = 10$ and $2x + 4y = 8$ graphically.

OR

$A = \{x : x \text{ is a perfect square, } x < 50, x \in \mathbb{N}\}$

$B = \{x : x = 8m + 1, \text{ where } m \in \mathbb{W}, x < 50, x \in \mathbb{N}\}$

Find $A \cap B$ and display it with Venn diagram.

17. Find the sum of all two digit positive integers which are divisible by 3 but not by 2.

OR

Total number of pencils required are given by $4x^4 + 2x^3 - 2x^2 + 62x - 66$.

If each box contains $x^2 + 2x - 3$ pencils, then find the number of boxes to be purchased.