

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**.
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**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 : 7×1=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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**[1]**

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

10. If the equation  $kx^2 - 2kx + 6 = 0$  has equal roots, then find the value of  $k$ .
11. Find the 7<sup>th</sup> 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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**[3]**

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.