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 answer book of **Part-A**.*

Part - A

Time : 2.00 Hours ***Marks : 35***

Note :

1. *Answer **all** the questions from the given **three** sections I, II and III of **Part-A**.*
2. *In section - III, every question has internal choice. Answer **any one** alternative.*

SECTION - 1

(Marks : 7×1=7)

NOTE : *(i) Answer **all** the following questions.*

*(ii) Each question carries **1** mark.*

1. Write the nature of roots of the quadratic equation $2x^2 - 5x + 6 = 0$.

2. Find the value of $\log_{\sqrt{2}} 256$.

3. In a GP, $t_n = (-1)^n \cdot 2017$. Find the common ratio.

4. Srikar says that the order of the polynomial $(x^2 - 5)(x^3 + 1)$ is 6. Do you agree with him ? How ?

5. A(0, 3), B(k, 0) and AB = 5. Find the positive value of k.

6. Show that the pair of linear equations $7x + y = 10$ and $x + 7y = 10$ are consistent.

7. Represent $A \cap B$ through Venn diagram, where A={1, 4, 6, 9, 10} and B = {perfect squares less than 25}.

SECTION - II

(Marks : 6×2=12)

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

8. Write any two three digit numbers. Find their L.C.M. and G.C.D. by prime factorization method.

9. Find the sum of first 10 terms of an A.P.
3, 15, 27, 39, ...

10. Which of $\sqrt{2}$ and 2 is a zero of the polynomial $p(x) = x^3 - 2x$? Why ?

11. The sum of a number and its reciprocal is $\frac{10}{3}$. Find the number.

12. Two vertices of a triangle are (3, 2), (–2, 1) and its centroid is $\left(\frac{5}{3}, -\frac{1}{3}\right)$.
Find the third vertex of the triangle.

13. Find the angle made by the line joining (5, 3) and (–1, –3) with the positive direction of X-axis.

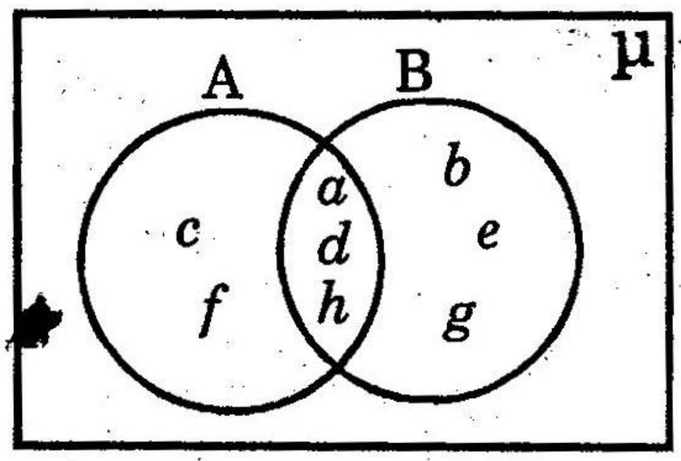
SECTION - III

(Marks : 4×4=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. From the following Venn diagram, write the elements of the sets of A and B. And verify $n(A \cup B) + n(A \cap B) = n(A) + n(B)$.



OR

Use Euclid's division lemma to show that the square of any positive integer is of the form $5n$ or $5n+1$ or $5n + 4$, where n is a whole number.

15. Find the sum of all three digit natural numbers, which are divisible by 3 and not divisible by 6.

OR

Divide $3x^4 - 5x^3 + 4x^2 + 3x - 5$ by $x^2 - 3$, and verify the division algorithm.

16. The perimeter of a right-angled triangle is 60 cm. and its hypotenuse is 25 cm. Then find the remaining two sides.

OR

The points C and D are on the line segment joining A(– 4, 7) and B(5, 13) such that AC = CD = DB. Then find co-ordinates of points C and D.

17. Draw the graph for the polynomial $p(x) = x^2 - 5x + 6$ and find the zeroes from the graph.

OR

Draw the graph of $2x + y = 6$ and $2x - y + 2 = 0$ and find the solution from the graph.
