This Question Paper contains 3 Printed Pages + Graph.

3101

15E & 16E (A)

MATHEMATICS

(English Version)

PART A & B

Time : 3 Hours] **[Maximum Marks : 80**

Instructions :

1. Answer all 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 : 2½ Hours] ***[Marks : 60***

Section – I **6 × 2 = 12**

Note : *(1) Answer **all** the following questions.*
*(2) Each question carries **2** marks.*

1. If A = $\{x : x \in N, x \text{ is a factor of } 12\}$ and B = $\{x : x \in N, 1 \leq x < 7\}$ then draw Venn diagram for A ∪ B.

2. Check whether the given points (3, – 2), (–2, 8) and (0, 4) in a plane are collinear ?

3. A right circular cylinder has radius 3.5 cm and height 14 cm. Find the curved surface area of the cylinder.

4. Write the formula for finding the n^{th} term of an arithmetic progression and explain each term of it.

5. Find the distance between the two points (3 sin θ, 0) and (0, 3 cos θ), where 'θ' is an acute angle.

6. If $\sin\theta = \frac{3}{5}$ then find the value of $\sec\theta + \tan\theta$.

Section – II

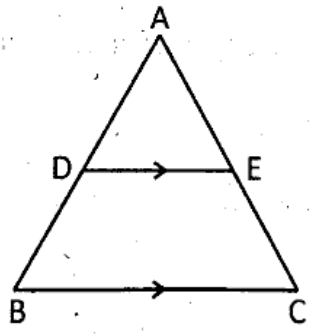
$6 \times 4 = 24$

Note : *(1) Answer **all** the following questions.*
*(2) Each question carries **4** marks.*

7. Write the formula for mode of a grouped data and explain each term of it.

8. Solve the following pair of linear equations in two variables :
$2x - 3y = 19$
$3x - 2y = 21$

9. In ΔABC, $DE \| BC$. If area of ΔADE is 9 cm^2 and area of trapezium DECB is 16 cm^2, then show that $\frac{AD}{DB} = \frac{3}{2}$.



10. If two persons standing on either side of a tower of height 100 m observed the top of it with angles of elevation of 60° and 45° respectively, then find the distance between the two persons.

11. A bag contains 7 red, 5 white and 6 black balls. If a ball is drawn from the bag at random, then find the probability that the ball drawn is (i) a white ball (ii) not a black ball.

12. If the ratio of base radii of two right circular cylinders is 1:2 and the ratio of their heights is 2:3 respectively, then find the ratio of their volumes.

Section – III

$4 \times 6 = 24$

Note : *(1) Answer any **FOUR** of the following **SIX** questions.*

*(2) Each question carries **6** marks.*

13. Prove that $\sqrt{3} + 2\sqrt{5}$ is an irrational number.

14. Find median for the following data :

Class Interval	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
Frequency	7	14	13	12	20	11	15	8

15. Construct a circle of radius 4 cm. Then construct a pair of tangents to the circle such that the angle between them is 60°.

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

17. Find the points of trisection of the line segment joining the points (2, – 2) and (– 7, 4).

18. The n^{th} term of an A.P. is $a_n = 3 + 4n$. If the sum of first 'n' terms of that A.P. is 525, then find the value of 'n'.
