

MATHEMATICS*(English version)***Parts A and B****Time : 3 hours 15 minutes]****(Maximum Marks : 80****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 in the answer book of **Part-A**.

Part-A**Time : 2 hours 45 minutes]****[Marks : 60****SECTION - I****6 × 2 = 12**

- Note :**
1. Answer **any SIX** questions choosing **three** from each of the following two groups, i.e., **A** and **B**.
 2. Each question carries **2** marks.

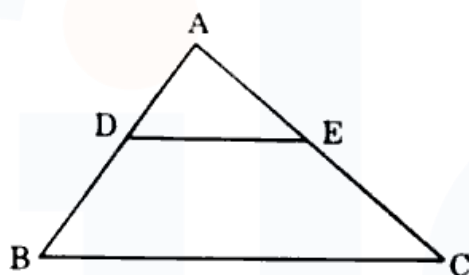
GROUP - A

1. Expand $\log a^3 b^2 c^5$.
2. If $p(x) = x^2 + 3x + 4$, then find the values of $p(0)$ and $p(1)$.
3. Find the 10th term of the arithmetic progression 3, 5, 7,

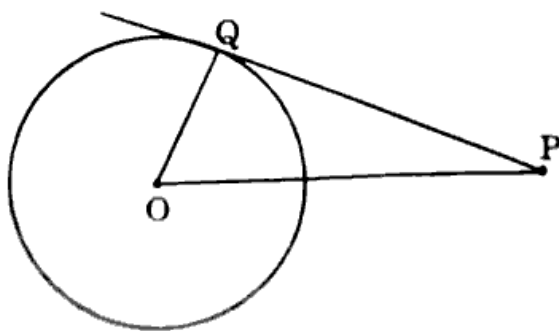
4. Is $(x + 2)^2 = x^2 + 3$ a Quadratic equation ? Justify.
5. The solutions of the linear equation $x + y = 5$ are (1, 4), (2, 3) and (3, 2). The solutions of another linear equation $x - y = 1$ are (3, 2), (2, 1) and (5, 4). Plot these points on a graph sheet and draw lines.
6. Find the distance between the points (0, 0) and $(\sin \theta, \cos \theta)$, where $0^\circ \leq \theta \leq 90^\circ$.

GROUP - B

7. Express $\tan \theta$ in terms of $\sin \theta$.
8. If a dice is rolled once, then find the probability of getting an odd number
9. A Joker's cap is in the form of a right circular cone, whose base radius is 7 cm and slant height is 25 cm. Find it's curved surface area.
10. In the given figure, ABC is a triangle. $AD = 3$ cm, $DB = 5$ cm, $AE = 6$ cm and $EC = 10$ cm. Is $DE \parallel BC$? Justify.



11. "The top of a tower is observed at an angle of elevation 45° and the foot of the tower is at a distance of 30 metres from the observer". Draw a suitable diagram for this data.
12. In the given figure, 'O' is the centre of a circle, OQ is the radius and $OQ = 5$ cm. The length of the tangent drawn from external point to the circle $PQ = 12$ cm. then find the distance between the points 'O' and 'P'.



- Note :**
1. Answer **any FOUR** of the following **Eight** questions.
 2. Each question carries **4** marks.

13. Solve

$$2x + y = 5 \text{ and } 5x + 3y = 11.$$

14. 5, 8, 11, 14, is an arithmetic progression. Find the sum of first 20 terms of it.

15. If $A = \{1, 2, 3, 4, 5\}$ and $B = \{2, 4, 6, 8\}$,

then show that $n(A \cup B) = n(A) + n(B) - n(A \cap B)$.

16. Write a Quadratic equation, whose roots are $3 + \sqrt{5}$ and $3 - \sqrt{5}$.

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

18. A box contains 20 cards which are numbered from 1 to 20. If one card is selected at random from the box, find the probability that it bears (i) a prime number, (ii) an even number.

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

[Note : Consider the two persons and the tower are on the same line.]

20. In a trapezium ABCD, $AB \parallel DC$. If diagonals intersect each other at

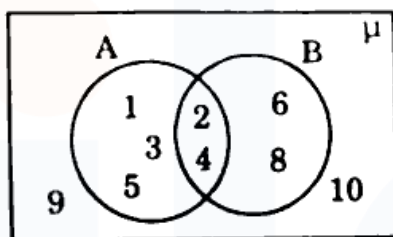
point 'O', then show that $\frac{AO}{BO} = \frac{CO}{DO}$.

SECTION-III**4 × 8 = 32**

- Note :**
1. Answer any **FOUR** questions choosing **Two** from each of the following two groups, i.e., **A** and **B**.
 2. Each question carries 8 marks.

GROUP - A

21. Draw the graph of the polynomial $p(x) = x^2 + 2x - 3$ and find the zeroes of the polynomial from the graph.
22. Prove that $\sqrt{5} + \sqrt{7}$ is an irrational number.
23. Show that the distance of the points (5, 12), (7, 24) and (35, 12) from the origin are arranged in ascending order forms an arithmetic progression. Find the common difference of the progression.
24. From the given Venn diagram, write the sets $A \cup B$, $A \cap B$, $A - B$ and $B - A$

**GROUP - B**

25. Draw a circle of radius 4 cm. From a point 9 cm away from its centre, construct a pair of tangents to the circle.
26. If $\sec \theta + \tan \theta = P$, then prove that $\sin \theta = \frac{P^2 - 1}{P^2 + 1}$.

27. Find the median for the following data.

Class interval	0-10	10-20	20-30	30-40	40-50
Frequency	6	10	12	8	8

28. The sum of the radius of base and height of a solid right circular cylinder is 37 cm. If its total surface area is 1628 square centimetres (cm^2), then find the volume of the cylinder (use $\pi = \frac{22}{7}$).