

# MATHEMATICS

(English version)

## Parts A and 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 to the answer book of **Part-A**.

### Part-A

Time : 2 hours 30 minutes]

[Marks : 60

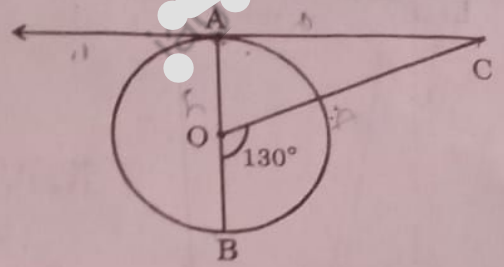
### SECTION - I

3 × 2 = 12

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

1. Express 360 as a product of prime factors.
2. Is the pair of linear equations  $3x - 5y = 7$  and  $6x - 10y = 13$  are inconsistent ? Justify your answer.
3. A flag pole stands vertically on the ground. From a point which is 15 metres away from the foot of the tower, the angle of elevation of the top of the tower is  $45^\circ$ . Draw a suitable diagram for the given data.

4. AOB is the diameter of a circle with centre 'O' and AC is a tangent to the circle at A. If  $\angle BOC = 130^\circ$ , then find  $\angle ACO$ .



5. Express 'sin  $\theta$ ' in terms of 'tan  $\theta$ '.
6. Construct a Quadratic equation having the roots  $\log_2 8$  and  $\log_{10} 100$ .

### SECTION - II

$6 \times 4 =$

**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.

8. Prove that 
$$\frac{\sin \theta}{1 + \cos \theta} + \frac{1 + \cos \theta}{\sin \theta} = 2 \operatorname{cosec} \theta$$

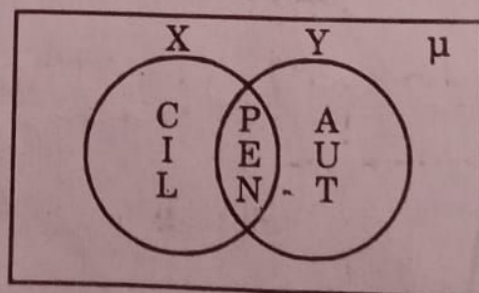
9. From the Venn diagram, find the following sets.

(i)  $X \cup Y$

(ii)  $X \cap Y$

(iii)  $X - Y$

(iv)  $Y - X$



10. In an arithmetic progression, if 4 times of fourth term is equal to 8 times of the eighth term, then prove that twelfth term of the progression is zero.
11. In a bag, there are 5 Red balls, 2 Black balls and 3 White balls. If one ball is selected randomly from the bag, then find the probability of -
- getting a Red ball.
  - getting not a Red ball.
12. In a rectangle ABCD,  $AB = 2x - y$ ,  $BC = 15$ ,  $CD = 2$  and  $DA = x + 3y$ , then find the values of  $x$  and  $y$ .

**SECTION - III**

**$4 \times 6 = 24$**

- Note :**
- Answer any 4 questions from the given six questions.
  - Each question carries 6 marks.

13. Prove that  $3\sqrt{5} + \sqrt{7}$  is an irrational number.
14. Draw the graph of the Quadratic polynomial  $p(x) = x^2 + x - 12$  and find the zeroes of the polynomial from the graph.
15. Find the Arithmetic mean of the following data.

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	11	14	15	20	15	13	12

16. Construct a triangle ABC with  $AB = 5.6$  cm,  $BC = 7.2$  cm and  $CA = 4.8$  cm. Construct another triangle similar to  $\triangle ABC$ , whose sides are  $\frac{3}{5}$  times of the corresponding sides of  $\triangle ABC$ .
17. The three vertices of a parallelogram ABCD are  $A(-1, -2)$ ,  $B(4, -1)$  and  $C(6, 3)$ . Find the coordinates of vertex D and find the area of parallelogram ABCD.
18. Due to heavy floods in the state thousands were rendered homeless. The State Government decided to provide canvas for 1500 tents. The lower part of each tent is cylindrical of base radius 2.8 meters and height 3.5 meters with conical upper part of same base radius but of height 2.1 meters. If the canvas used to make the tent costs Rs 100 per square meter, find the total cost of canvas to construct the tents.
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