(4)

Roll No.....

Total No. of Questions : 17] [Total No. of Printed Pages : 8

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8903–X

MATHEMATICS

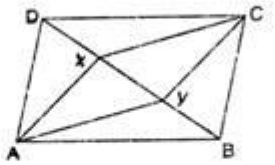
(Term–2nd)

Time : 3 Hours] [Maximum Marks : 80

Note :— (i) All questions are cumpulsory.

(ii) Diagrams, wherever necessary should be neat and accurate.

1. In the following Fig. □ ABCD is a parallelogram and *x*, *y* are points on the diagonal BD such that D*x* = B*y*. Prove that □ A*x*C*y* is a parallelogram.



Or

Prove that a quadrilateral is a parallelogram if its opposite sides are equal. 8

2. Construct a Δ ABC with perimeter 10.5 cm and base angles 60° and 45°. Write steps of construction. Only compass and ruler is allowed.

Or

Construct Δ ABC, with BC = 5 cm, AB = 7.5 cm and $\angle B = 45°$. Measure the other two angles. 8

3. A ladder is placed against a wall such that it just reaches the top of the wall. The foot of the ladder is 1.5 m away from the wall and the ladder is inclined at an angle of 60° with the ground. Find the height of the wall. ($\sqrt{3} = 1.73$)

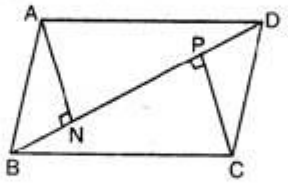
Or

A tower stands vertically on the ground. At a point on the ground, 15 m away from the foot of the tower, the angle of elevation of the top of the tower is 60°. What is the height of the tower ? ($\sqrt{3} = 1.73$) 8

4. In Fig. AN and CP are perpendiculars to the diagonal BD of a parallelogram ABCD. Prove that :

(i) Δ ADN $\equiv$ CBP and

(ii) AN = CP.



Or

If the diagonals of a quadrilateral bisect each other, then the quadrilateral is a parallelogram. 5

The perpendicular bisectors of the sides of a triangle pass through the same point.

Or

In Δ ABC, the medians AD, BE and CF intersect in G. Show that

$BE + CF > \frac{3}{2} BC$. 5

If $\tan A = 2$, evaluate :

$$\sec A \sin A + \tan^2 A - \operatorname{cosec} A.$$

Or

Verify that :

$$\frac{\tan 60^\circ - \tan 30^\circ}{1 + \tan 60^\circ \tan 30^\circ} = \tan 30^\circ.$$ 5

Define :

(i) Secondary data

(ii) Primary data

(iii) Grouped data.

Or

The electricity bill (in rupees) of 25 houses in a certain locality for the period of 15-3-1987 to 14-5-1987 are given below :

50, 44, 10, 18, 5, 8, 56, 30, 22, 30, 24, 15, 12, 27, 42, 45, 25, 24, 20, 22, 14, 16, 25, 36, 47.

Form cumulative frequency table. 5

8. For the data given below draw the Histogram and Frequency polygon :

Cost of Living Index	No. of Months
440–460	2
460–480	4
480–500	3
500–520	5
520–540	3
540–560	2
560–580	1
580–600	4
	24

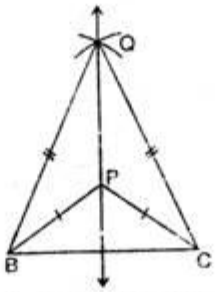
Or

The given table presents the number of literate females in the age group (10-34) in a town :

Age Group	No. of Females
10–14	300
15–19	980
20–24	800
25–29	580
30–34	290
Total	2,950

Draw histogram from the above. 5

9. Δ PBC and Δ QBC are two isosceles triangles on the same side of the same base. Show that the line PQ bisects BC and is perpendicular to BC. 3



10. Explain the meaning of the following terms :

    (i) Cumulative frequency of a class

    (ii) Class limit

    (iii) Class size 3

11. Find all trigonometrical ratios of 45°. 3

12. Evaluate :

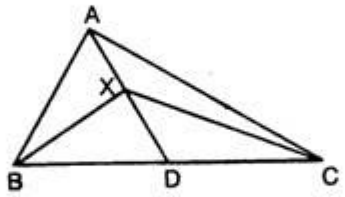
$$\sin 30° \cos 45° + \cos 30° \sin 45°.$$ 3

13. The diagonals of parallelogram bisects each other. Prove. 3

14. The medians of a triangle are equal to each other. Show that the triangle is equilateral. 3

15. Triangles on the same base and between the same parallels are equal in area. 3

16. AD is one of the medians of a Δ ABC. X is any point on AD. Show that ar(Δ ABX) = ar(Δ ACX) 3



17. In each of the following questions, choose the correct/most appropriate answer and write it in your answer-book which is provided to you :

(i) The class mark of Class Interval 5-10 is :

(a) 7.5

(b) 5

(c) 10

(d) None of these 1

(ii) Tally Mark 𝍸 represents the frequency :

(a) 4

(b) 5

(c) 0

(d) None of these 1

(iii) Class size between 52-47 is :

(a) 5

(b) 6

(c) 47

(d) None of these 1

(iv) $\frac{1}{\sqrt{2}}$ is the value of :

(a) sin 45°

(b) sin 60°

(c) sin 30°

(d) None of these 1

(v) The point of intersection of perpendicular bisectors of the sides of a triangle is called :

(a) Centroide

(b) Circumcentre

(c) Incentre

(d) None of these 1

(vi) Area of trapezium is equal to :

(a) $\frac{1}{2}$ (sum of parallel sides) × altitude

(b) Parallel sides × median

(c) $\frac{\text{median} \times \text{altitude}}{2}$

(d) None of these 1

(vii) Triangles on the same base and between the same parallels are :

(a) Double in area

(b) Equal in area

(c) $2\frac{1}{2}$ times the area

(d) None of these 1