

GENERAL INSTRUCTIONS :

- ▶ The question paper consists of 14 questions divided into 3 sections A, B, C.
- ▶ All questions are compulsory.
- ▶ Section A comprises of 6 questions of 2 marks each. Internal choice has been provided in two questions.
- ▶ Section B comprises of 4 questions of 3 marks each. Internal choice has been provided in one question.
- ▶ Section C comprises of 4 questions of 4 marks each. An internal choice has been provided in one question. It contains two case study based questions.

SECTION-A

1. Find the zeroes of the quadratic equation $21y^2 - 11y - 2 = 0$.

OR

What is the nature of roots of the quadratic equation $5y^2 - 4y + 3 = 0$?

2. A solid metal cone with radius of base 12 cm and height 24 cm, is melted to form spherical solid balls of diameter 6 cm each. Find the number of balls thus formed.
3. The following table shows the heights (in cm) of 50 girls of Class X of a school.

Height (in cm)	120-130	130-140	140-150	150-160	160-170	Total
Number of girls	2	8	12	20	8	50

Find the mean of the above data.

4. How many terms are there in the sequence 4, 7, 10, 13,, 112?
5. A student noted the number of cars passing through a spot on a road for 100 periods each of 3 min and summarised it in the table given below:

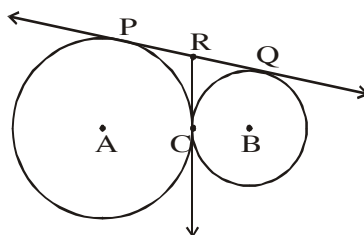
Number of cars	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	7	13	14	11	20	12	15	8

Find the mode of the data.

6. Find the radius of a circle, if the length of tangent from a point at distance of 13 cm from the centre of the circle is 12 cm.

OR

If two circles touch each other at the point C. Prove that the common tangent to the circles at C, bisects the common tangent PQ.



SECTION-B

7. Find the sum of series

$$7 + 10\frac{1}{2} + 14 + \dots + 84$$

8. The angle of elevation of the top of a hill from the foot of a tower is 60° and the angle of the elevation of the top of the tower from the foot of the hill is 30° . If the tower is 65 m high, how high is the hill?

OR

Two pillars of equal height are on either sides of a road, which is 100 m wide. The angles of the top of the pillars are 60° and 30° at a point on the road between the pillars. Find the position of the point between the pillars. Also, find the height of each pillar.

9. Two circles of radii 5 cm and 3 cm are concentric. Calculate the length of a chord of the outer circle which touches the inner circle.
10. Solve for x : $9x^2 - 9(a + b)x + (2a^2 + 5ab + 2b^2) = 0$

SECTION-C

11. Draw a pair of tangents to a circle of radius 7 cm which are inclined to each other at an angle of 75° .

OR

Draw a line segment $AB = 8$ cm and divide it internally in the ratio 3 : 5.

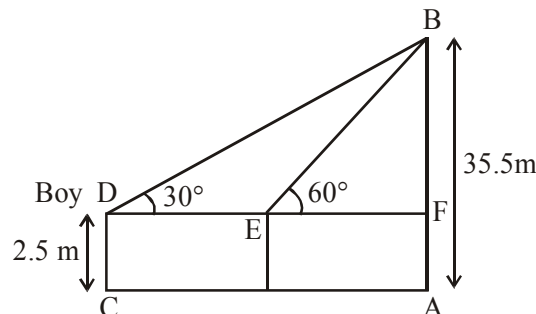
12. A health officer took an initiative of organising a medical camp in a remote village. The medical checkup of 400 students of the age group of 10 yr and their heights were recorded as follows

Height (in cm)	Frequency
160-162	15
163-165	117
166-168	136
169-171	118
172-174	14

Then, find the median height of students.

13. **Case Study-1**

Arjun is studying in X standard. He observes a 2.5 m tall boy is standing at some distance from a 35.5 m tall building. The angle of elevation from his eye to the top of the building increases from 30° to 60° as he walks towards the building.



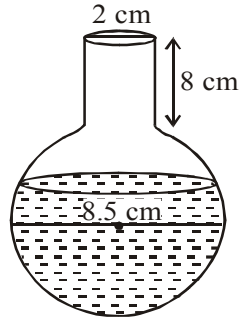
Few questions came to his mind while observing boy. Give answer to his questions by looking at the figure.

- (i) Find length of EF.
- (ii) Find the distance he walked towards the building.

14.

Case Study-2

Rekha is studying in X standard. She is doing an activity to understand a solid figure shown in following figure. Few questions came to her mind while doing the activity. Give answers to his questions by looking at the figure. (Use $\pi = 3.14$)



- (i) Find the volume of (cm^3) of spherical part.
- (ii) Find the total volume (cm^3) of solid figure.

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