

**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 roots of  $x^2 - 4x - 8 = 0$

**OR**

Find the discriminant of equation  $x^2 - 4x + 1 = 0$

2. Three cubes of volume  $27 \text{ cm}^3$  each are joined end to end to form a solid. Find the surface area of the cuboid so formed.
3. Find the mode of the following frequency distribution :

Classes	0-6	6-12	12-18	18-24	24-30
Frequency	7	5	10	12	6

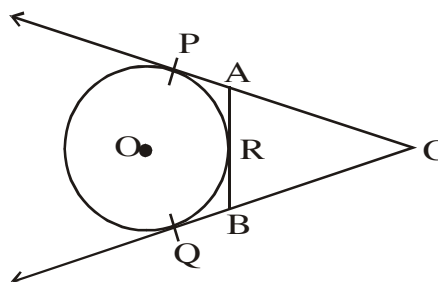
4. For what value of  $n$ , are the  $n$ th terms of two APs  $63, 65, 67, \dots$  and  $3, 10, 17, \dots$  equal ?
5. Find median of the following distribution

Class	12.5 - 17.5	17.5 - 22.5	22.5 - 27.5	27.5 - 32.5	32.5 - 37.5
Frequency	2	22	19	14	13

6. Prove that the tangents drawn at the ends of a diameter of a circle are parallel.

**OR**

In figure, CP and CQ are tangents to a circle with centre O. ARB is another tangent touching circle at R. If  $CP = 11 \text{ cm}$  and  $BC = 7 \text{ cm}$  then find the length of BR.



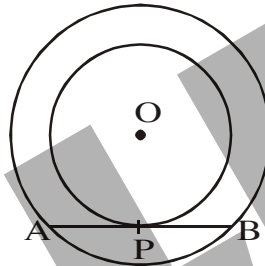
**SECTION-B**

7. Find the sum of the first 25 terms of an AP, whose  $n^{\text{th}}$  term is given by  $a_n = 7 - 3n$ .
8. A captain of an aeroplane flying at an altitude of 1000 metres sights two ships as shown in the figure. If the angle of depressions are  $60^\circ$  and  $30^\circ$ , find the distance between the ships.

**OR**

A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground making an angle  $30^\circ$  with it. The distance between the foot of the tree to the point where the top touches the ground is 8 m, find the height of the tree.

9. There are two concentric circles, each with centre O and of radii 10 cm and 26 cm respectively. Find the length of the chord AB of the outer circle which touches the inner circle at P.



10. The sum of the squares of two consecutive natural numbers is 421. Find the numbers.

**SECTION-C**

11. Draw a circle of radius 3 cm. Draw a pair of tangents to this circle, which are inclined to each other at an angle of  $60^\circ$ .

**OR**

Construct a pair of tangents to the circle of radius 4 cm from a point on the concentric circle of radius 6 cm.

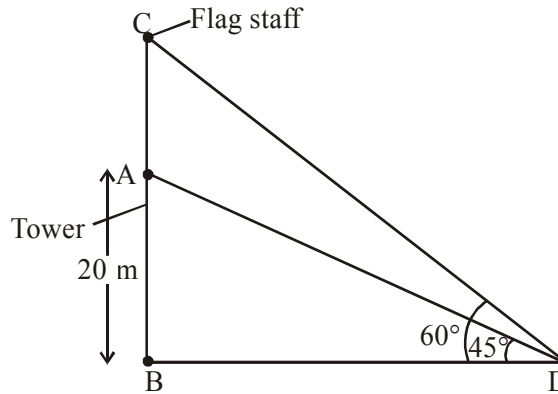
12. The mean of the following distribution is 62.8 and the sum of all frequencies is 50. Compute the missing frequencies  $f_1$  and  $f_2$ .

Class Interval	0-20	20-40	40-60	60-80	80-100	100-120	Total
Frequency	5	$f_1$	10	$f_2$	7	8	50

13.

**Case Study-1**

Rekha is studying in X standard, she observing a flag staff on a tower of height 20 m.



At a point on the ground, the angle of elevation of the foot and top of the flag are  $45^\circ$  and  $60^\circ$  as shown in the figure.

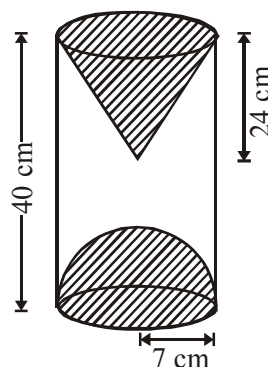
Few questions came to her mind while she observing the flag staff.

- (i) What is the length of BD?
- (ii) What is the length of flag staff ?

14.

**Case Study-2**

Mathematics teacher organised an activity for class X. He is interested to make a wooden article that is made by scooping out a hemisphere from one end of a cylinder and cone from the other end, as shown in the figure.



Answer the following question below.

- (i) Find the slant height of the cone.
- (ii) Find the total surface of wooden article.