PRACTICE PAPER- 4
Mathematics- Standard (041)
CLASS X
Session: 2021-22
TERM II

Time Allowed: 2 hours **Maximum Marks: 40**

General Instructions:

1. The question paper consists of 14 questions divided into 3 sections A, B, C.
2. All questions are compulsory.
3. Section A comprises of 6 questions of 2 marks each. Internal choice has been provided in two questions.
4. Section B comprises of 4questions of 3 marks each. Internal choice has been provided in one question.
5. 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 8^{th} term from the end of the A.P. 7,10, 13, ..., 184. **[2]**

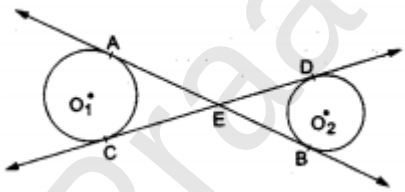
   OR

   Is the given series 2, 4, 8, 16, ... form an AP? If It forms an AP, then find the common difference d and write the next three terms.

2. Solve the quadratic equation by factorization: **[2]**

   $3x^2 - 14x - 5 = 0$

3. In the given figure, common tangents AB and CD to the two circles with centres O_1 and O_2 intersect at E. Prove that AB = CD. **[2]**



4. A copper sphere of radius 3 cm is melted and recast into a right circular cone of height 3 cm. Find the radius of the base of the cone. **[2]**
5. Write the frequency distribution table for the following data: **[2]**

Marks(out of 90)	**Number of candidates**
More than or equal to 80	4
More than or equal to 70	6
More than or equal to 60	11
More than or equal to 50	17

More than or equal to 40	23
More than or equal to 30	27
More than or equal to 20	30
More than or equal to 10	32
More than or equal to 0	34

6. Find the roots of the quadratic equation $4x^2 - 4px + (p^2 - q^2) = 0$. **[2]**

OR

Find the roots of the quadratic equation given as: $2x^2 + x - 4 = 0$ by applying the quadratic formula.

Section B

7. Find the mean, median and mode of the following data: **[3]**

Class	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100	100 - 120	120 - 140
Frequency	6	8	10	12	6	5	3

8. Construct a ΔABC in which AB = 5 cm. $\angle B = 60^\circ$ altitude CD = 3 cm. Construct a ΔAQR similar to ΔABC such that side of ΔAQR is 1.5 times that of the corresponding sides of ΔACB. **[3]**

9. Find the mean of the following frequency distribution, using the assumed-mean method: **[3]**

Class	100 - 120	120 -140	140 - 160	160 - 180	180 - 200
Frequency	10	20	30	15	5

10. If a tower 30m high, casts a shadow $10\sqrt{3}m$ long on the ground, then what is the angle of elevation of the sun? **[3]**

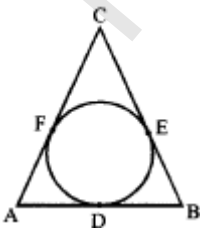
OR

A man rowing a boat away from a lighthouse 150 m high takes 2 minutes to change the angle of elevation of the top of lighthouse from 45° to 30°. Find the speed of the boat. (Use $\sqrt{3}$ = 1.732)

Section C

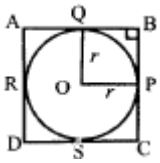
11. An iron pillar has some part in the form of a right circular cylinder and remaining in the form of a right circular cone. The radius of base of each of cone and cylinder is 8 cm. The cylindrical part is 240 cm high and the conical part is 36 cm high. Find the weight of the pillar, if one cubic cm of iron weighs 10 g. **[4]**

12. In the adjoining figure, a circle inscribed in triangle ABC touches its sides AB, BC and AC at points D, E and F respectively. If AB = 12 cm, BC = 8 cm and AC = 10 cm, find the lengths of AD, BE and CF. **[4]**

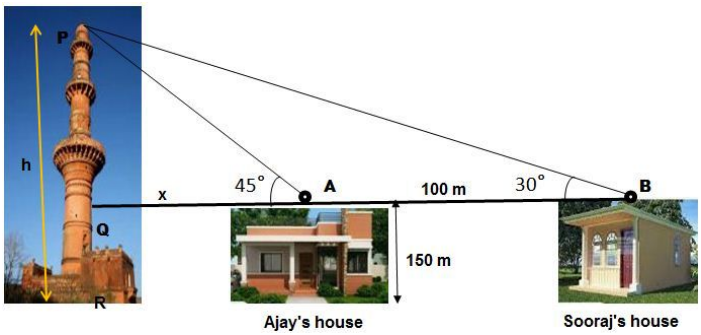


OR

In the adjoining figure, a circle is inscribed in a quadrilateral ABCD in which $\angle B$ = 90°. If AD = 23 cm, AB = 29 cm, and DS = 5 cm, find the radius (r) of the circle.



13. The houses of Ajay and Sooraj are at 100 m distance and the height of their houses is the same as approx 150m. One big tower was situated near their house. Once both friends decided to measure the height of the tower. They measure the angle of elevation of the top of the tower from the roof of their houses. The angle of elevation of ajay's house to the tower and sooraj's house to the tower are 45^o and 30^o respectively as shown in the figure. **[4]**



By using the above given information answer the following questions:

i. Find the height of the tower.

ii. What is the distance between the tower and the house of Sooraj?

14. Akshat's father is planning some construction work in his terrace area. He ordered 360 bricks and instructed the supplier to keep the bricks in such as way that the bottom row has 30 bricks and next is one less than that and so on. **[4]**

The supplier stacked these 360 bricks in the following manner, 30 bricks in the bottom row, 29 bricks in the next row, 28 bricks in the row next to it, and so on.

i. In how many rows, 360 bricks are placed?

ii. How many bricks are there in the top row?