Sample Question Paper - 7
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. Is the given sequence: $\sqrt{3}, \sqrt{6}, \sqrt{9}, \sqrt{12}, \ldots$ form an AP? If it forms an AP, then find the common difference d and write the next three terms. **[2]**

   OR

   Find the n^{th} term of the AP: 5, 11, 17, 23, ...

2. If x = 2 and x = 3 are roots of the equation $3x^2 - 2kx + 2m = 0$, find the value of k and m. **[2]**

3. In the adjoining figure, a circle touches the side DF of △EDF at H and touches ED and EF produced at K and M respectively. If EK = 9 cm, then what is perimeter of △EDF? **[2]**

4. A toy is in the form of a cone mounted on a hemisphere with the same radius. The diameter of the base of the conical portion is 6 cm and its height is 4 cm. Determine the surface area of the toy. (Use π = 3.14) **[2]**

5. If the class mark of a continuous frequency distribution are 12, 14, 16, 18, ..., then find the class intervals corresponding to the class marks 16 and 22. **[2]**

6. Two taps running together can fill a tank in $3\frac{1}{13}$ hours. If one tap takes 3 hours more than the other to fill the tank, then how much time will each tap take to fill the tank? **[2]**

   OR

   Find the values of k for which the given equation has real roots:

   $5x^2 - kx + 1 = 0$

Section B

7. Find the median of the following frequency distribution: **[3]**

Weekly wages (in ₹)	60-69	70-79	80-89	90-99	100-109	110-119
No. of days	5	15	20	30	20	8

8. Let PQR be a right triangle in which PQ = 3 cm, QR = 4 cm and $\angle Q = 90°$. QS is the perpendicular from Q on PR. The circle through Q, R, S is drawn. Construct the tangents from P to this circle. **[3]**

9. The arithmetic mean of the following frequency distribution is 50. **[3]**

Class	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
Frequency	16	p	30	32	14

Find the value of p.

10. From a window (60 metres high above the ground) of a house in street the angles of elevation and depression of the top and the foot of another house on opposite side of street are 60° and 45° respectively. Show that the height of the opposite house is $60(1+\sqrt{3})$metres. **[3]**

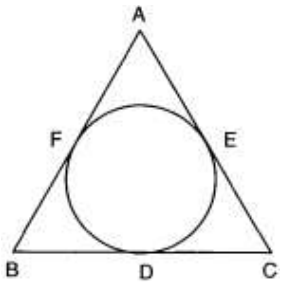
OR

Two boats approach a light house in mid-sea from opposite directions. The angles of elevations of the top of the lighthouse from two boats are 30° and 45° respectively. If the distance between two boats is 100 m, find the height of the lighthouse.

Section C

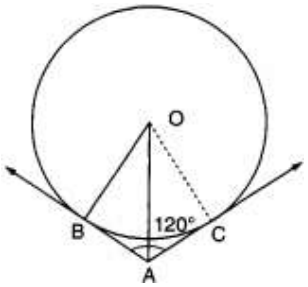
11. The interior of a building is in the form of cylinder of diameter 4.3 m and height 3.8 m, surmounted by a cone whose vertical angle is a right angle. Find the area of the surface and the volume of the building. (Use π = 3.14). **[4]**

12. In figure the incircle of ΔABC touches the sides BC, CA and AB at D, E and F respectively. Show that AF + BD + CE = AE + BF + CD = $\frac{1}{2}$(Perimeter of ΔABC) **[4]**



OR

In fig., two tangents AB and AC are drawn to a circle with centre O such that $\angle BAC = 120^\circ$. Prove that OA = 2AB.



13. A TV tower stands vertically on a bank of a canal. From a point on the other bank of a canal. From a point on the other bank directly opposite the tower, the angle of elevation of the top of **[4]**

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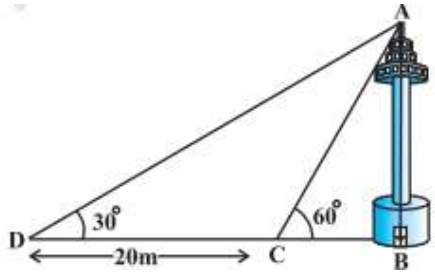
the tower is 60^o from a point 20 m away from this point on the same bank the angle of elevation of the top of the tower is 30^o.

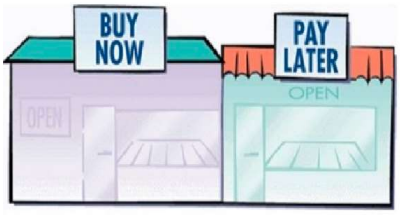


i. Find the height of the tower

ii. Find the width of the canal.

14. Deepa has to buy a scooty. She can buy scooty either making cashdown payment of Rs. 25,000 or by making 15 monthly instalments as below. **[4]**

Ist month - Rs. 3425, Ilnd month - Rs. 3225, Illrd month - Rs. 3025, IVth month - Rs. 2825 and so on.



i. Find the amount of 6th instalment.

ii. Total amount paid in 15 instalments.