CLASS X
GUESS PAPER
MATHEMATICS BASICS(241)

Duration: 2 Hours **Max. Marks: 40**

GENERAL INSTRUCTIONS:

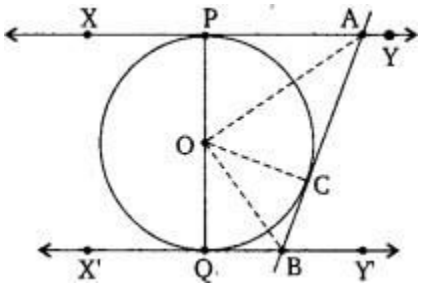
1. The question paper consists of 14 questions divided into 3 sections A, B, C.
2. Section A comprises of 6 questions of 2 marks each. Internal choice has been provided in two questions.
3. Section B comprises of 4 questions of 3 marks each. Internal choice has been provided in one question.
4. Section 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.

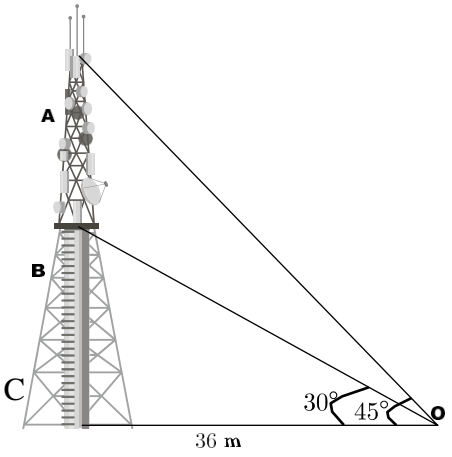
SECTION A

Q. NO.		MARKS
1.	Find the roots of the quadratic equation $2x^2 - x + \frac{1}{8} = 0$ OR Find the values of k for which the quadratic equation kx (x – 2) + 6 = 0 has real andequal roots.	2
2.	A toy is in the form of a cone of radius 3.5cm mounted on a hemisphere of same radius. The total height of the toy is 15.5cm. Find the total surface area of the solid.	2
3.	The distribution below gives the weight of 30 students of a class. Find the median weight of the students	2

Weight in Kg	40 - 45	45 –50	50 - 55	55 - 60	60 - 65	65 – 70	70 - 75
Number of students	2	3	8	6	6	3	2

4.	Find the common difference of the AP 4,9,14, … If the first term changes to 6 and the common difference remains the same then write the new AP.	2
5.	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° with it. The distance between the foot of thetree to the point where the top touches the ground is 8 m. Find the height of the tree.	2

6.	Two concentric circles are of radii 5cm and 3cm. Find the length of chord of the larger circle which touches the smaller circle. OR Prove that the tangents drawn at the ends of a diameter of a circle are parallel.	2
	SECTION B	
7.	A hemispherical bowl of internal radius 9cm is full of water. Its contents are emptied in a cylindrical vessel of internal radius 6cm. Find the height of water in thecylindrical vessel. OR A cylindrical vessel with internal diameter 10cm and height 10.5cm is full of water. A solid cone of base diameter 7cm and height 6cm is completely immersed in water.Find he volume of water displaced out of the cylindrical vessel and water left in cylindrical vessel.	3
8.	The sum of the squares of three positive numbers that are consecutive multiples of 5is 725. Find the three numbers.	3
9.	The angles of depression of two ships from the top of a light house and on the same side of it are found to be 45° and 30°. If the ships are 200 m apart, find the height ofthe light house.	3
10.	In figure, XY and X'Y' are two parallel tangents to a circle, x with center O and another tangent AB with point of contact C intersecting XY at A and X'Y' at B. Prove that ∠AOB = 90°.  	3
	SECTION C	
11.	Construct two concentric circles of radii 3cm and 7cm. Draw two tangents to the smaller circle from a point P which lies on the bigger circle. OR Draw a pair of tangents to a circle of radius 6cm which are inclined to each other atan angle of 60^0. Also find the length of the tangent.	4

<table>
<tr><td>12.</td><td>A class teacher has the following absentee record of 40 students of a classfor the whole term. Find the mean number of days a student was absent.
<table><tr><th>No. of days</th><th>No. of students</th></tr><tr><td>0 – 6</td><td>11</td></tr><tr><td>6 – 10</td><td>10</td></tr><tr><td>10 – 14</td><td>7</td></tr><tr><td>14 – 20</td><td>4</td></tr><tr><td>20 – 28</td><td>4</td></tr><tr><td>28 – 38</td><td>3</td></tr><tr><td>38 – 40</td><td>1</td></tr></table></td><td>4</td></tr>
<tr><td>13.</td><td>Radio towers are used for transmitting a range of communication services includingradio and television. The tower will either act as an antenna itself or support one or more antennas on its structure, including microwave dishes. They are among the tallest human-made structures. There are 2 main types: guyed and self-supporting structures.
On a similar concept, a radio station tower was built in two sections A and B. Tower is supported by wires from a point O. Distance between the base of the tower and point O is 36 m.
From point O, the angle of elevationof the top of section B is 30° and the angle of elevation of the top of section A is 45°.On the basis of given information answers the following questions.
 
</td><td></td></tr>
<tr><td>13-i</td><td>What is the height of the sections A + B?</td><td>2</td></tr>
<tr><td>13-ii</td><td>What is the length of the wire structure from the point O to the top of section A?</td><td>2</td></tr>
</table>

14.	Your friend Neeta wants to participate in 200m race. She can currently run that distance in 51 seconds and with each day of practice it takes her 2 seconds less, she wants to do it 31 seconds. On the basis of given information answers the following questions. 	
14 – i_	Write the first three terms of an AP from the given condition	2
14- ii	What is the minimum number of days she needs to practice till her goal is achieved?	2

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