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INDIAN SCHOOL SOHAR

PRE - BOARD II EXAMINATION (2021-22)

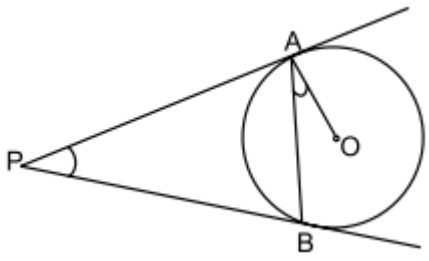
MATHEMATICS – STANDARD (041)

CLASS: X **MAX. MARKS: 40**

DATE: 24 /03/22 **TIME ALLOWED: 2 HOURS**

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 6 questions of 2 marks each. Internal choice has been provided in two questions.
4. Section B comprises 4 questions of 3 marks each. Internal choice has been provided in one question.
5. Section C comprises 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	Which term of the A P 3, 10, 17 …will be 84 more than its 13^{th} term? **OR** Find the value of the middle most term(s) of the arithmetic progression : -11,-7,-3,…… 49	2
2	Find the nature of the roots of the quadratic equation $\sqrt{3}\,x^2 - 2\sqrt{2}\,x - 2\sqrt{3} = 0$	2
3	Two tangents PA and PB are drawn to a circle with Centre O from an external point P. Prove that $\angle APB = 2\ \angle OAB$. 	2
4	A toy in the form of a cone mounted on a hemisphere of common base radius 7 cm. The total height of the toy is 31 cm. Find the total surface area of the toy.	2
5	The difference of two numbers is 8 and the sum of their squares is 274.Find the numbers. **OR** For what value of "k" the equation $4x^2 – 2(k+1)\,x + (k + 1) = 0$ has equal roots?	2

6	Find the mean of the following frequency distribution table. 	Class Interval	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
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Frequency	5	12	10	14	9		2
	SECTION B	
7	Calculate the mode of the following frequency distribution table 	Marks	Above 25	Above 35	Above 45	Above 55	Above 65	Above 75	Above 85
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Number of students	52	47	37	17	8	2	0		3
8	Construct a pair of tangents to a circle of radius 4 cm, which are inclined to each other at an angle of 60^0.	3
9	Calculate the missing frequency "p" from the following distribution, it is given that median of the distribution is 24. 	Class Interval	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
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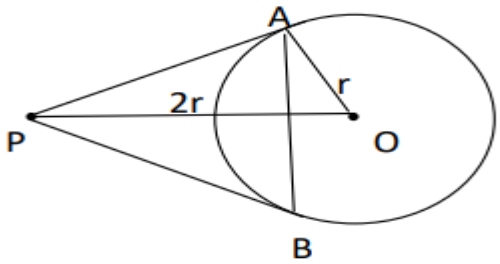
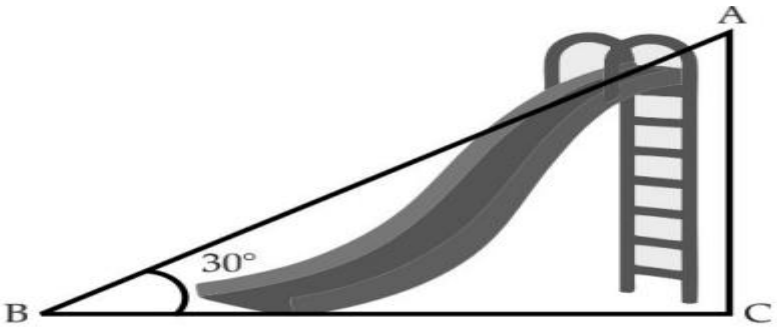
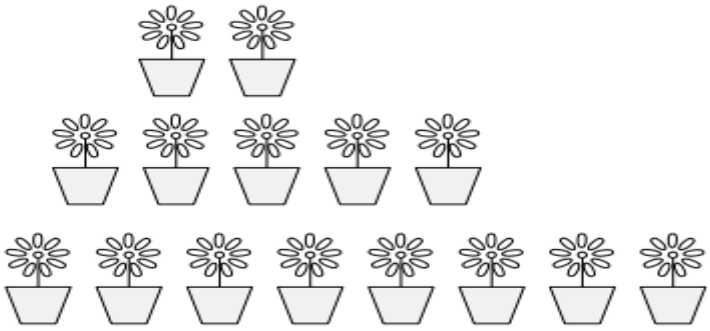
Frequency	5	25	p	18	7		3
10	From a point 100 m above a lake, the angle of elevation of a helicopter is 30^0 and the angle of depression of reflection of the helicopter in the lake is 60^0.Find the height of the helicopter above the lake. **OR** From an aeroplane vertically above a straight horizontal road, the angles of depression of two consecutive kilometer stones on opposite sides of the aeroplane are observed to be 60^0 and 30^0. Show that the height of aeroplane above the road is $\frac{\sqrt{3}}{4}$ km.	3
	SECTION C	
11	In the figure, from a point P two tangents PA and PB are drawn to a circle C(O,r).If OP = 2r then prove that Δ ABP is an equilateral triangle.  **OR** Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.	4

12	A well with 7 m inside diameter is dug 22 m deep, earth taken out of it has been spread all around it to a width of 10.5 m to form an embankment. Find the height of the embankment so formed.	4
13	**CASE STUDY – 1** Authority wants to construct a slide in a city park for children. The slide was to be constructed for children below the age of 12 years. Authority prefers the top of the slide at a height of 4 m above the ground and inclined at an angle of 30^0 to the ground. Based on the following figure related to the slide answer the questions : (i)Find the distance of AB. (ii)In the given figure , if AB + BC = 25 m and AC = 5 m ,then find the value of BC  	(2) (2)
14	**CASE STUDY – 2** Arun being a plant lover decides to start a nursery. He bought few plants with pots. He placed the pots in such a way that the number of pots in the first row is 2, in the second is 5, in the third row is 8 and so on.  Based on the above, answer the following questions: (i)How many pots were placed in the 7^{th} row? (ii)If Arun wants to place 100 pots in total then find the total number of rows formed in this arrangement.	(2) (2)

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