KENDRIYA VIDYALAYA SANGATHAN , REGION JABALPUR

PRE- BOARD EXAMINATION 2025-26

SUB:- MATHEMATICS (STANDARD)

CLASS X

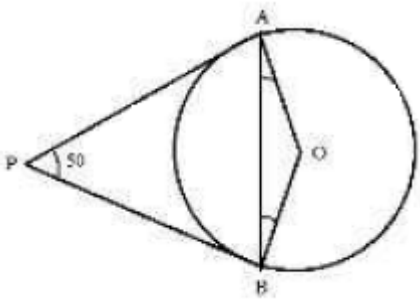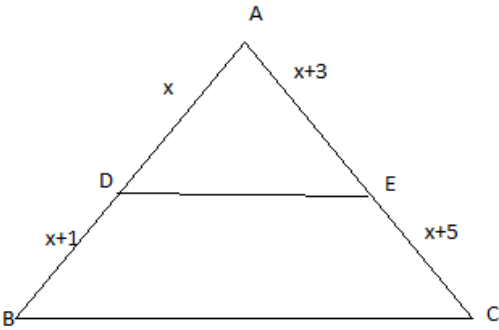**Time: 3 Hours**   **MM: 80**
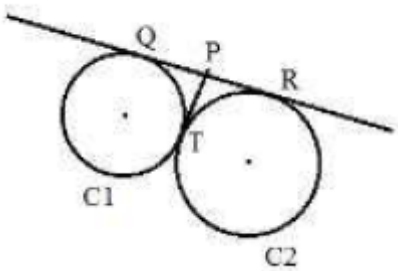
General Instructions:

1. This Question Paper has 5 Sections A, B, C, D, and E.

2. Section A has 20 Multiple Choice Questions (MCQs) carrying 1 mark each.

3. Section B has 5 Short Answer-I (SA-I) type questions carrying 2 marks each.

4. Section C has 6 Short Answer-II (SA-II) type questions carrying 3 marks each.

5. Section D has 4 Long Answer (LA) type questions carrying 5 marks each.

6. Section E has 3 Case Based integrated units of assessment (4 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.

7. All Questions are compulsory. However, an internal choice in 2 Qs of 2 marks, 2 Qs of 3 marks and 2 Questions of 5 marks has been provided. An internal choice has been provided in the 2 marks questions of Sections E.

8. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

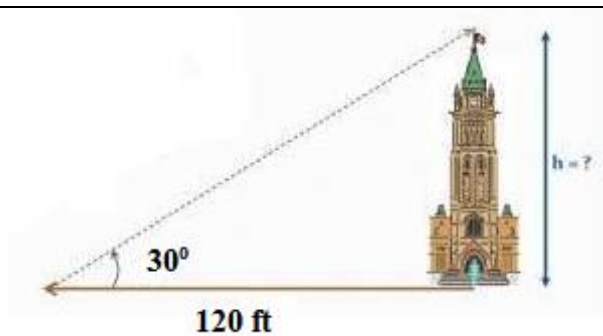| Q No.	Section A	Marks
1	The ratio of area to perimeter of a circle of radius 4 cm is (a) 1:1 (b) 1:2 (c) 2:1 (d) 1:4	1
2	There are 30 cards of the same size in a bag in which the numbers I to 30 are written. One card is taken out of the bag at random. What is the probability that the number on the selected card is not divisible by 3? (a) 1/5 (b) 2/3 (c) 1/10 (d) 1/3	1
3	In the figure, if PA and PB are tangents to the circle with centre O such that $\angle APB = 50^0$, then OAB is equal to (a) 25^0 (b) 30^0 (c) 40^0 (d) 50^0 	1

4	$\sqrt{3}\cos^2 A + \sqrt{3}\sin^2 A$ is equal to (a)1 (b) $2\sqrt{3}$ (c) $\sqrt{3}$ $(d)0$	1
5	The mean of 5 numbers is 18. One number is excluded, then their mean becomes 16. Then the excluded number is. (a) 23 (b) 24 (c) 25 (d) 26	1
6	If the lines given by x + 2ky = 2 and 2x + 5y - 4 = O are coincident, then the value of k is (a) -5/4 (b) -2/5 (c) 5/4 (d) 5	1
7	If the sum of first n terms of an AP is $2n^2 + 3n$. Then its second term is – (a) 6 (b) 7 (c) 9 (d) 11	1
8	The distance of point A(2, 4) from x-axis is (a) 2 units (b) 4 units (c) -2 units (d) - 4 units	1
9	A tangent to a circle intersects it in ……. Point (s) (a) 1 (b) 2 (c) 3 (d) infinite	1
10	The length of tangent from a Point A at distance 5 cm from the centre of the circle is 4 cm. Find the radius of the circle. (a) 2 cm (b) 3 cm (c) 4 cm (d) 5 cm	1
11	7th term of an AP is 40. The sum of its first 13 terms is - (a) 260 (b) 540 (c) 520 (d) 560	1
12	In Triangle, ABC, DE II BC , the value of x will be a) 1 b) 2 c) 3 d) 4	1
13	In $\triangle ABC$, if AB = $6\sqrt{3}$cm, AC= 12 cm, BC =6 cm, the angle B is (a) 120^0 (b) 90^0 (c) 60^0 (d) 45^0	1

14	Consider the following distribution	1
	<table><tr><td>Class</td><td>0-5</td><td>5-10</td><td>10-15</td><td>15-20</td><td>20-25</td></tr><tr><td>Frequency</td><td>10</td><td>15</td><td>12</td><td>20</td><td>9</td></tr></table> The sum of class limits of the median class is (a) 15 (b) 25 (c) 35 (d)45	
15	The sum of the probabilities of all the elementary events of an experiment is … (a)1 (b)0 (c) -1 (d) 2	1
16	The Perimeter of a square circumscribing a circle of radius r is (a) 8 r (b) 4 r (c) 2 r (d) 16 r	1
17	The total surface area of a solid hemisphere of radius 7 cm is : (a) 447π cm^2 (b) 239π cm^2 (c) $174\ \pi$ cm (d) 147π cm^2	1
18	A quadratic polynomial, whose zeroes are -2 and 3 is (a) $x^2 + x - 6$ (b) $x^2 +5x+ 6$ (c) $x^2 + x + 6$ (d) $x^2 – x – 6$	1
19	Assertion (A): 6^n ends with zero for some natural number n. Reason (R) : A number ending in zero must have 2 and 5 among its prime factors. (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) (c) Assertion (A) is true but reason (R) is false. (d) Assertion (A) is false but reason(R) is true	1
20	Assertion (A): If one root of the quadratic equation $6x^2 - x - k = 0$ is 2/3, then the value of k is 2. Reason (R): A quadratic equation has at the most two real roots. (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) (c) Assertion (A) is true but reason (R) is false. d Assertion A is false but reason R is true	1
	Section B	
	Section B consists of 5 questions of 2 marks each.	

21	In a circle of radius 21 cm. an arc subtended an angle of 60^0 at the centre, find.
	
	      (i) The length of the arc.
	
	      (ii) Area of sector formed by the arc.
	
	             OR
	
	 Find two numbers whose sums is 27 and product is 182.
		2

22	Find the values of Y for which the distance between the points P(2, -3) and Q(10, Y) is 10 units.	2
23	If $2\sin A - 1 = 0$, find the value of cosec A + cot A OR If $\tan\theta = \dfrac{p}{q}$, then find the value of $\dfrac{p\sin\theta - q\cos\theta}{p\sin\theta - q\cos\theta}$	2
24	In the figure, QR is common tangent to circles C1 and C2 touching externally at T. Find the length of QR if QP=3.2cm. 	2
25	Given that HCF (306, 657) = 9, find LCM (306, 657)	2
	Section C	
	Section C consists of 6 questions of 3 marks each.	
26	Show that $(\sin A - 2\sin^3 A) / (2\cos^3 A - \cos A) = \tan A$	3
27	Prove that the tangent to a circle is perpendicular to the radius at point of contact. OR Prove that the parallelogram circumscribing a circle is a rhombus.	3
28	Find the zeroes of the following quadratic polynomial and verify the relationship between the zeroes and the coefficients. $3x^2 - x - 4$	3

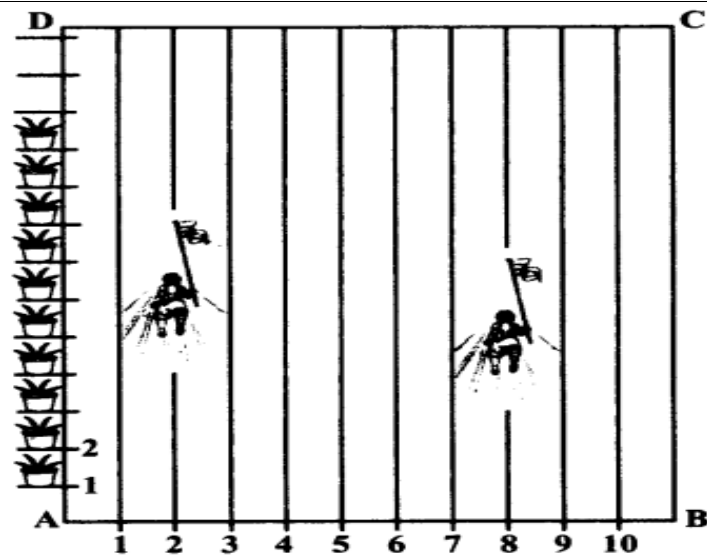| 29	Two dice are thrown at the same time. What is the probability that the sum of the two numbers appearing on the top of the dice is (i) 8 (ii) 13 (iii) less than or equal to 12	3
30	Prove that $(3 - 2\sqrt{5})$ is irrational, given that $\sqrt{5}$ is an irrational number.	3

31	Solve 2x+3y=11 and 2x-4y= -24 and hence find the value of m for which
	
	  y = mx+3
	
	                 OR
	
	Solve for x and y
	
	      37 x + 43 y = 123,
	
	      43 x + 37 y = 117
		3

	Section D	
	Section D consists of 4 questions of 5 marks each.	
32	The sum of squares of two consecutive odd number is 394. Find the number. OR A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train.	5
33	State and prove BPT and If a line intersects sides AB and AC of a Δ ABC at D and E respectively and is parallel to BC, prove that $\dfrac{AD}{AB} = \dfrac{AE}{AC}$	5
34	If the median of the following frequency distribution is 32.5, find the values of f_1 and f_2 	Classes	0-10	10-20	20-30	30-40	40-50	50-60	60-70	Total
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Frequency	F_1	5	9	12	F_2	3	2	40		5
35	A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius. The total height of the toy15.5 cm. Find the total surface area of the toy. OR A circus tent is in the shape of a cylinder surmounted by a conical top of the same diameter is 56 m, the height of cylindrical part is 6 m and the total height	5

of the tent above the ground is 27 m, find the area of canvas used in making the tent.

	Section E	
	Section E consists of 4 questions of 4 (=1+1+2) marks each.	
36	India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year.	

(1) What is the production during first year ?

(2) What is the production during 8th year?

(3) In which year , the production is Rs. 29,200?

OR

What is the difference of the production during 7th year and 4^{th}year ?

| 1 |
| 1 |
| |
| 2 |

| 37 | The angle of elevation is a widely used concept related to height and distance, especially in trigonometry. It is defined as an angle between the horizontal plane and oblique line from the observer's eye to some object above his eye. To establish the height of a building, a person walks 120 ft away from the building. at that point an angle of elevationof 30^0 is formed when looking at the top of the building. | |

1	What is the height of the building (in feet)?	1
2	Which trigonometric ratios are not defined at an angle of 90^0 .	1
3	What is the distance between the tip of the building and the observation point? OR At a particular time of the day, the shadow of the building is as long as the height of the building. What would be the inclination of sun in that case?	2

38	In order to conduct sports day activities in your school, lines have been drawn with chalk powder at a distance of 1m each , in a rectangular shaped ground ABCD , 100 flowerpots have been placed at a distance of 1m from each other along AD , as shown in given figure below. Niharika runs $\frac{1}{4}$ th the distance AD on the 2nd line and post a green flag . Preet runs $\frac{1}{5}$ th distance AD on the eighth line and posts a red flag .	

(1) What are the coordinates of the green flag posted by Niharika?

(2) What is the distance between both the flags ?

(3) If Rashmi has to post a blue flag exactly the halfway between the line segment joining the two flags, where should she post her flag?

OR

If joy has to post a flag at one-fourth distance from green flag in the line segment joining the green and red flags, then where should he post his flag ?

1

1

2

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