KENDRIYA VIDYALAYA SANGATHAN (JAMMU REGION)

PRE- BOARD I (2025-26) (SET NO -2)

CLASS: X   **Max Marks: 80**

Subject: Mathematics (Standard)   **Time Allowed: 3 Hours**
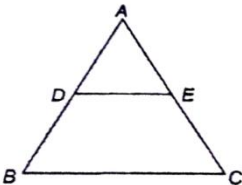
General Instructions:
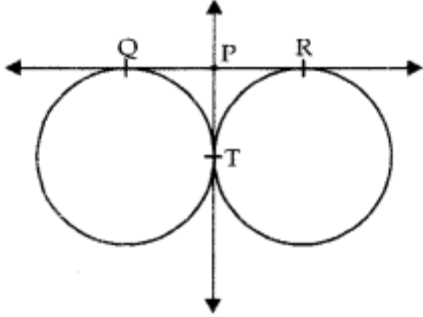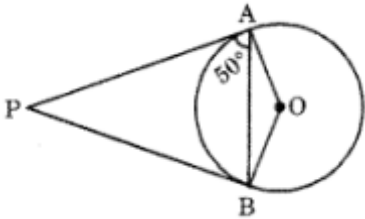Read the following instructions very carefully and strictly follow them:
- (i)   This question paper contains **38 questions**. All questions are compulsory.
- (ii)   This question paper is divided into **Five Sections – A, B, C, D** and **E**.
- (iii)   In **Section A**, question numbers **1 to 18** are Multiple Choice Questions **(MCQs)** and question numbers **19** and **20** are Assertion-Reason based questions of **1** mark each.
- (iv)   In **Section B**, question numbers **21 to 25** are Very Short Answer (VSA) type questions, carrying **2** marks each.
- (v)   In **Section – C**, question numbers **26 to 31** are Short answer (SA) type questions, carrying **3** marks each.
- (vi)   In **Section D**, question numbers **32 to 35** are Long Answer (LA) type questions, carrying **5** marks each.
- (vii)   In **Section E**, question numbers **36 to 38** are Case Study based questions carrying **4** marks each. Internal choice is provided in **2** marks questions in each case- study.
- (viii) There is no overall choice. However, an internal choice has been provided in **2** questions in Section B, **2** questions in Section C, **2** questions in Section D and 3 questions in Section **E**.
- (ix)   Take $\pi = \frac{22}{7}$ wherever required, if not stated.
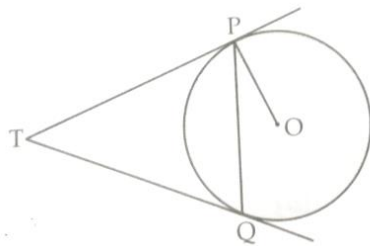- (x)   Use of calculator is **NOT** allowed.

	SECTION – A	
	Section A consists of Multiple Choice type questions of 1 mark each	
1.	If two positive integers a and b can be expressed as $a = pq^2$ and $b = p^3q$ where p and q prime numbers, then LCM(a,b) is (a) p^3q^2 (b) p^2q^3 (c) pq (d) p^3q^3	1
2.	If one of the zero of the polynomial $x^2+ 3x +k$ is 2, then the value of k is (a) -10 (b) 10 (c) 5 (d) –5	1

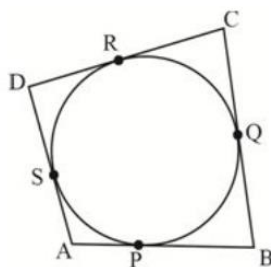| 3.	*The* value of p for which 3x-5y = 7 and 6x+py=14 have infinitely many solutions is: (a) 10 (b) -10 (c) 15 (d) -15	1

4.	The nature of roots of the quadratic equation $9x^2-6x-2 = 0$ is
	    (a) No real roots (b) 2 equal real roots
	    (c)2 distinct real roots (d) More than 2 real
	                                        roots
		1

5.	Which term of the A.P. -29, -26, -23,………, 61 is 16? (a) 11th (b) 16th (c) 10th (d) 31st	1
6.	In ΔABC, DE‖BC, as shown in the figure). If AD=2cm, BD=3cm, BC=7.5cm, then the length of DE(in cm) is: (a) 2.5 (b) 3 (c) 5 (d) 6	1
7.	If k+2, 4k-6 and 3k-2 are three consecutive terms of an AP, Then the value of k is (a) 3 (b) -3 (c) 4 (d) -4	1
8.	Given $\Delta ABC \sim \Delta PQR$, $\angle A = 30°$ and $\angle Q = 90°$. The value of ($\angle R+ \angle B$) is (a) 90° (b) 120° (c) 150° (d) 180°	1
9.	The distance of the point (-1, 7), from x-axis is (a) -1 (b) 7 (c) 6 (d) $\sqrt{50}$	1
10.	$\left(\dfrac{2 \tan 30^0}{1+ \tan^2 30^o}\right)$ is equal to: (a) sin 60° (b)cos 60° (c) tan 60° (d) sin 30°	1

11.	The length of tangent from an external point P on a circle with centre O is
	    (a) always greater than OP
	    (b) equal to OP
	    (c) always less than OP
	    (d) information insufficient
		1

12.	The midpoint of the line segment joining the points P(-4,5) and Q(4, 6) lies on: (a) x – axis (b) y- axis (c) origin (d) neither x- axis nor y -axis	1
13.	If $\tan3\theta = \sqrt{3}$, then $\frac{\theta}{2}$ equals (a) 60° (b) 30° (c) 20° (d) 10°	1
14.	What is the total surface area of a solid hemisphere of diameter 'd'? (a) $3\pi d^2$ (b) $2\pi d^2$ (c) $\frac{1}{2}\pi d^2$ (d) $\frac{3}{4}\pi d^2$	1
15.	In fig., QR is a common tangent to the given circles, touching externally at the point T. The tangent at T meets QR at P. If PT = 3.8 cm, find the length of QR. (a) 7.6 cm (b) 5.4 cm (c) 9.6 cm (d) 6.6	1
16.	From an external point P, tangents PA and PB are drawn to a circle with centre O. If ∠PAB = 50°, then ∠AOB is equal to (a) 120° (b) 100° (c) 140° (d) 90°	1
17.	The middle most observation of every data arranged in order is called: (a) mode (b) median (c) mean (d) deviation	1
18.	Two coins are tossed together. The probability of getting at least one tail is:	1

	(a) $\frac{1}{4}$ (b) $\frac{1}{2}$ (c) $\frac{3}{4}$ (d) 1	

19.	Assertion (A): A fair die is thrown once. The probability of getting a prime number is $\frac{1}{2}$.
	Reason (R): A natural number is a prime number if it has only two factors, 1 and the number itself.
	   (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 but 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: If the value of mode and mean is 60 and 66 respectively, then the value of median is 64.
	Reason: 3Median = Mode + 2 Mean
	   (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 but 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 Very Short Answer (VSA) type questions of 2 marks each	
21.	If HCF of 65 and 117 is expressible in the form 65n – 117, then find the value of n.	2
22.	Find the zeroes of the quadratic polynomial $6x^2 – 13x +6$ and verify the relationship between the zeroes and its coefficients.	2
23.	Find the value of p, so that quadratic equation px (x – 3) + 9 has equal roots. **OR** If x =3 is one root of the quadratic equation x^2- 2kx-6 = 0, then find the value of k.	2
24.	Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that $\angle PTQ = 2\angle OPQ$	2

OR

A quadrilateral ABCD is draw to circumscribe a circle. Prove that AB+ CD = BC+ AD

| 25. | sin(A+B) = 1 and sin(A-B) = $\frac{1}{2}$, $0\leq$ A+B$\leq$ 90° and A>B, then find A and B. | 2 |

SECTION- C
Section- C consists of Short Answer (SA) type questions of 3 marks each
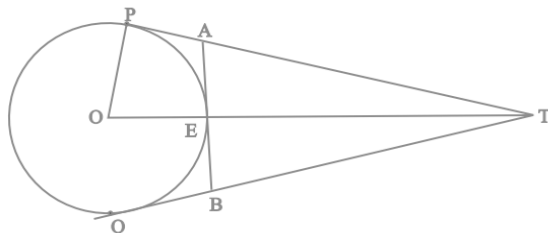
| 26. | Prove $\sqrt{5}$ is irrational. | 3 |
| 27. | Find the mode: | 3 |

Marks	No. of students
More than or equal to 25	52
More than or equal to 35	47
More than or equal to 45	37
More than or equal to 55	17
More than or equal to 65	8
More than or equal to 75	2
More than or equal to 85	0

OR

The median of following data is 525. Find the values of x and y, if total frequency is 100.

Class	Frequency
0 - 100	2
100 -200	5
200 -300	x
300 -400	12
400 - 500	17
500 – 600	20
600 - 700	Y
700 - 800	9
800 - 900	7
900 - 1000	4

28	Prove that: $\dfrac{\sin A - 2\sin^3 A}{2cos^3 A - \cos A} = \tan A$	3
29.	The sum of first 15 terms of an A.P. is 750 and its first term is 15. Find its 20th term.	3
30	A fraction becomes $\dfrac{1}{3}$ when 2 is subtracted from the numerator and it becomes $\dfrac{1}{2}$ when 1 is subtracted from the denominator. Find the fraction. **OR** The sum of the digits of a two digit number is 8 and the difference between the number and that formed by reversing the digits is 18. Find the number.	3
31.	In given figure, O is the centre of a circle of radius 5 cm, T is a point such that OT = 13 cm and OT intersects the circle at E. If AB is the tangent to the circle at E, find the length of AB. 	3

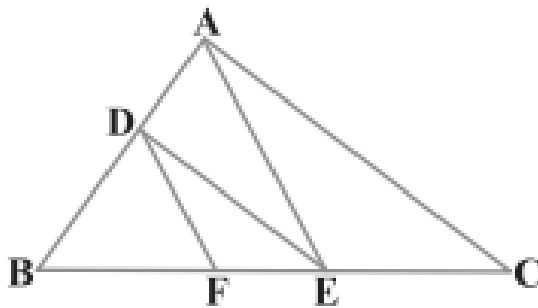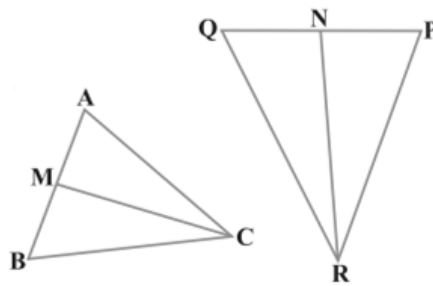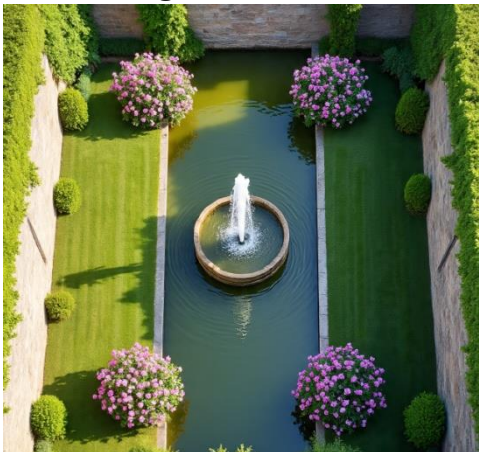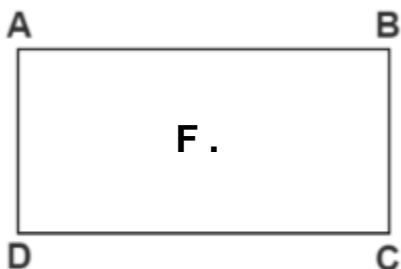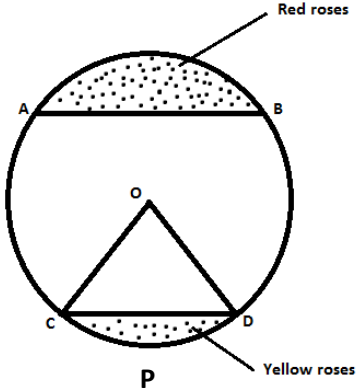|	**SECTION- D**	
	Section- C consists of Long Answer (LA) type questions of 5 marks each	
32.	A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train. **OR** If the roots of the quadratic equation $(a - b) x^2 + (b - c)x + (c - a) = 0$ are equal, prove that $2a = b + c$.	5

33.	(a) Prove: If a line is drawn parallel to one side of a triangle intersecting the other sides, then it divides the two sides in the same ratio.
	(b) In the Fig. given below, DE || AC and DF || AE. Prove that $$\frac{BF}{BE} = \frac{FE}{EC}$$
	
	OR
	
	In given figure, CM and RN are respectively the medians $\triangle$ ABC and $\triangle$PQR. If $\triangle$ ABC $\sim \triangle$ PQR ,
	Prove that :
	    (i) $\triangle$ AMC $\sim \triangle$ PNR
	    (ii) $\frac{CM}{RN} = \frac{AB}{PQ}$
	    (iii) $\triangle$ CMB $\sim \triangle$ RNQ
	
		5

34.	Two ships are there in the sea on either side of a light house in such a way that the ships and the light house are in the same straight line. The angles of depression of two ships as observed from the top of the light house are 60° and 45°. If the height of the light house is 200 m, find the distance between the two ships. [Use $\sqrt{3}$ = 1.73]	5
35.	Due to sudden floods, some welfare associations jointly requested the government to get 100 tents fixed immediately and offered to contribute 50% of the cost, If the lower part of each tent is of the form of a cylinder of diameter 4.2 m and height 4 m with the conical upper part of same diameter but of height 2.8 m, and the canvas to be used costs 100 per sq. m, find the amount the associations will have to pay.(Use $\pi = \frac{22}{7}$)	5

SECTION E
Section- E consists of three Case Study based questions carrying 4 marks each

36.	**Case Study: A Garden Layout** The Municipal Corporation of a city is planning to design a rectangular park. The four corners of the garden are represented as : A(2,3); B(10,3); C(10,8); D(2,8) Inside the garden, there is a fountain at point F(6, 5.5) (i) Find the length of side AB. (ii) Verify whether the fountain F lies on the point of intersection of the diagonals. (iii) Find the area of the garden. **OR** The garden is to be fenced. Find the total length of fencing required.	 1 1 2

37.	**Case Study**: Flower beds look beautiful growing in gardens. One such circular park of radius 35m, has two segments with flowers. One segment which subtends an angle of 90° at the centre is full of red roses, while the other segment with central angle 60° is full of yellow coloured flowers. i. Find the length of wire required to fence the entire park . ii. Find the area of the sector OCPD with yellow flowers. iii. Find the area of the segment with red roses. **OR** If AB = 40 m, Find the length of boundary of the flower bed consisting of red roses.	1 1 2
38.	A school organizes a lucky draw contest during sports fair. There are 500 students who participated and each student got one ticket. For 1st prize, one winner got selected. For 2nd prize, 5 winners got selected. For third prize, 10 winners got selected and next 20 winners got consolation prize. A student is randomly selected from the 500 participants.	

Based on above information, answer the following questions.

(i) What is the probability that the selected student wins a prize?

1

(ii) What is the probability that the selected student does not win any prize?

1

(iii) What is the probability that the selected student wins neither 1st nor 2nd prize?

2

OR

What is the probability that the selected student neither win 3rd nor consolation prize?