KENDRIYA VIDYALAYA SANGATHAN, GURUGRAM REGION

PRE-BOARD EXAMINATION 2025-26

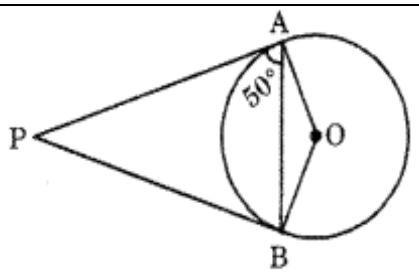
Class: X **Max Marks: 80**

Subject: 041- Mathematics (Standard) **Time: 3 Hours**

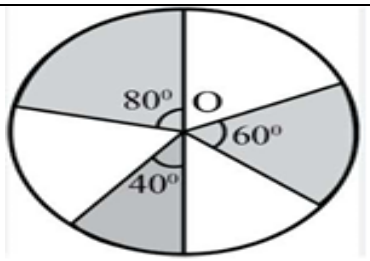
General Instructions:

1. This Question paper contains- five sections A, B, C, D and E. Each section is compulsory. However internal choice is provided in some questions.
2. Section A has 20 MCQ's of 1 mark each.
3. Section B has 5 Very Short Answer type questions of 2 marks each.
4. Section C has 6 Short Answer (SA) type questions of 3 marks each.
5. Section D has 4 Long Answer (LA) type questions of 5 marks each.
6. Section E has 3 sources based /case based/passage based/integrated units of assessment of 4 marks each.

SECTION A

1.	If one root of equation $4x^2-2x+P-4=0$ is reciprocal of the other. The value of P is: (a) -8 (b) 8 (c) -4 (d) 4
2.	Which of the following is not irrational? (a) $(2-\sqrt{3})/2$ (b) $(\sqrt{2}+\sqrt{3})/2$ (c) $(\sqrt{2}-\sqrt{3})(\sqrt{2}+\sqrt{3})$ (d)$27\sqrt{7}$
3.	The value of $(1+\tan^2 A).(1-\sin A)(1+\sin A)$ is (a) 3 (b) 2 (c) 1 (d) 0
4.	From an external point P, tangents PA and PB are drawn to a circle with centre O. If $\angle PAB = 50°$, then measure of $\angle AOB$ is ? (a) 100 (b) 80 (c) 120 (d) 90 
5.	If one zero of the polynomials (ax^2+bx+c) is the reciprocal of the other, and $(a \neq 0)$, then which of the following must be true? (a) b = c (b) $b^2 = 4ac$ (c) c = a (d) a = 0

6. In figure, three sectors of a circle of radius 7 cm making angles of 60°, 80° and 40° at the centre are shaded. The area of the shaded region is



(a) 154 cm^2 (b) 77cm^2

(c) 120.5 cm^2 (d) 180 cm^2

7. The length of the diagonal of a rectangle with vertices A (1, 2) B (1,5) C(6,5) D (6,2) is ……

(a) √34 (b) 5 (c) √52 (d) 50

8. For the following distribution

Class	0-5	5-10	10-15	15-20	20-25
Frequency	10	15	12	20	9

The sum of lower limits of median class and modal class is:

(a) 15 (b) 25 (c) 30 (d) 35

9. The value of p for which the pair px – y = 2 and 6x – 2y = 3 will have no solution is:……

(a) 3 (b) -12 (c) -1 (d) both (a) and (c)

10. The area of the circle that can be inscribed in a square of side 8 cm is:

(a) 36 π cm^2 (b) 16 π cm^2 (c) 12 π cm^2 (d) 9 π cm^2

11. In ΔABC, AB = 6 cm and DE || BC such that AE = 1/4 AC then the length of AD is:

(a) 2 cm (b) 1.2 cm (c)1.5 cm (d) 4 cm

12. A Card is drawn at random from a pack of 52 cards. What is the probability that the card drawn is a Diamond (or) King?

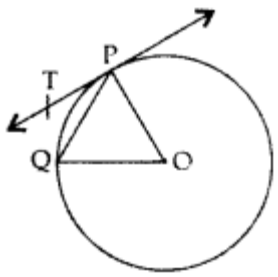
(a) 1/13 (b) 2/13 (c) 4/13 (d) 9/13

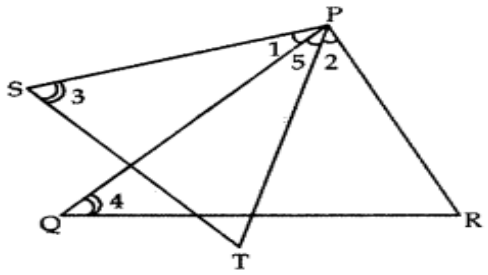
13. LCM of the given number ‘x’ and ‘y’ where y is a multiple of ‘x’ is given by

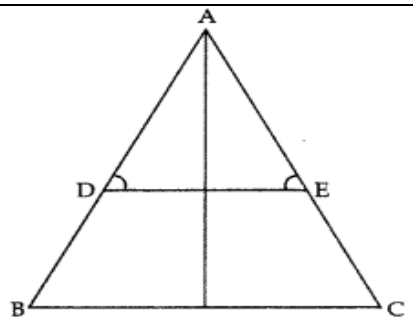
(a) x (b) y (c) xy (d) x/y

14. In a cylindrical container of base radius is 6 cm has some water in it. If the level of the water is 10 cm the volume of the water in the container is

(a) 5.672 L (b) 4.0228 L (c) 3.8925 L (d) 1.13 L

15.	$5 \tan^2 A - 5 \sec^2 A + 1$ is equal to (a) 6 (b) -5 (c) 1 (d) -4
16.	The Probability that cannot exist among the following (a) 0.23 (b) -1.6 (c) 25% (d) 0.7
17.	The point which divides the lines segment joining the points (7, -6) and (3, 4) in ratio 1 : 2 internally lies in the (a) I quadrant (b) II quadrant (c) III quadrant (d) IV quadrant
18.	Two concentric circles are of radii 6 cm and 8 cm. The length of the chord of the larger circle which touches the smaller circle is: (a) 20 cm (b) 10 cm (c) 12 cm (d) 28 cm
	In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as: **(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.**
19.	**Assertion**: The value of $\sin \theta = 4/3$ is not possible. **Reason**: 3, 4, 5 form a Pythagorean triplet.
20.	**Assertion:** If HCF of two numbers is 5 and their product is 150, then their LCM is 40. **Reason**: For any two positive integers a and b, HCF (a, b) x LCM (a, b) = a x b.
	SECTION B
21.	In the given figure, O is the centre of a circle, PQ is a chord and PT is the tangent at P. If $\angle POQ = 70°$, then calculate $\angle TPQ$. 

22.	Find the number of natural numbers between 101 and 999 which are divisible by both 2 and 5. **(OR)** Find 10th term from end of the A.P. 4,9, 14, …, 254.
23.	Area of a sector of a circle of radius 36 cm is 54 π cm^2. Find the length of the corresponding arc of the sector. **OR** A car has two wipers which do not overlap. Each wiper has a blade of length 25 cm sweeping through an angle of 115°. Find the total area cleaned at each sweep of the blades.
24.	If tan θ + cot θ = 5, find the value of $\tan^2\theta + \cot^2\theta$.
25.	In fig., ∠1 = ∠2 and ∠3 = ∠4. Show that PT. QR = PR. ST. 
SECTION C	
26.	Solve the following system of linear equations graphically. 3x + y – 12 = 0; x – 3y + 6 = 0 Shade the region bounded by the lines and x axis. Also, find the area of shaded region. **(OR)** The sum of the digits of a two-digit number is 12. The number obtained by interchanging the two digits exceeds the given number by 18. Find the number.

27.	Coloured pencils are available in market in packs of 12 each, oil pastels in a pack of 10 and crayons in pack of 32 each. A girl wants full pack of all three and the same number of pencils, oil pastels and crayons, how many of each would she need to buy?
28.	If $x = p \sec\theta + q \tan\theta$ and $y = p \tan\theta + q \sec\theta$, then prove that $x^2 - y^2 = p^2 - q^2$. **(OR)** Prove that $(\sin A + \text{cosec } A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$.
29.	Prove that the parallelogram circumscribing a circle is a rhombus.
30.	Form a quadratic polynomial one of whose zero is $2 + \sqrt{5}$ and the sum of zeroes is 4.
31.	A box contains 29 balls bearing numbers 1, 2, 3, ..., 29. A ball is drawn at random from the box. What is the probability that the number on the ball is (i) a prime number, (ii) divisible by 3 or 5, (iii) neither divisible by 5 nor by 10.
	SECTION D
32.	State and prove the converse Basic Proportionality theorem. Hence, in the fig., $\angle D = \angle E$ and AD/DB=AE/EC. Prove that ΔBAC is an isosceles triangle. 
33.	A rocket is in the form a right Circular Cylinder closed at the lower end and surmounted by a cone with same radius as that of cylinder. The diameter and height of the cylinder are 9 m and 25 m, respectively. If the slant height of the conical portion is the 7.5 m, find the total surface area and volume of the rocket.

(OR)

Find the number for the solid spheres, each of diameter 6 cm, so that they can be made by melting a solid metal cylinder for the height of 45 cm and a diameter of 4 cm.

34. The sum of the areas of two squares is 468 m^2. If the difference of their perimeters is 24 m, find the sides of the two squares.

35. The median of the following data is 868. Find the values of x and y, if the total frequency is 100.

Class	800 – 820	820 – 840	840 – 860	860 – 880	880 – 900	900 – 920	920 – 940
Frequency	7	14	x	25	y	10	5

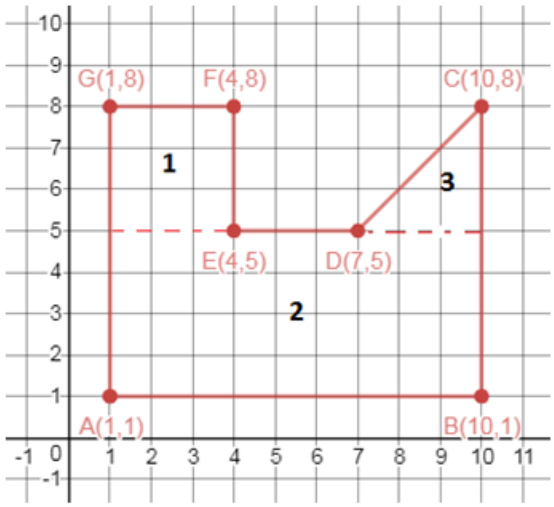
(OR)

The mean of the following data is 42. Find the missing frequencies x and y if the sum of frequencies is 100.

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	7	10	x	13	y	10	14	9

SECTION E

36. A student of class X located points A, B, C, D, E, F, and G on a graph sheet with given coordinates.



<u>BASED ON ABOVE INFORMATION ANSWER THE FOLLOWING QUESTIONS</u>

(i) Find the length of line segment DE.

(ii) Find the midpoint of line segment GB.

(iii) Find the point on y-axis which is equidistance from C and E.

(OR)

Find the coordinates of the point which divides the line segment GA in the ratio 1:2.

37.



Garba is a form of dance which originates from the state of Gujarat in India. The name is derived from the Sanskrit term Garbha. Many traditional garbas are performed around a centrally lit lamp or a picture or statue of the Goddess Shakti. Traditionally, it is performed in circles around this lamp during the nine-day Indian festival Navaratri. In the garba ground in a colony, it was decided to fix the participants to 1500. The dancers were to perform in concentric rings in such a way that each succeeding (outer) ring had 10 more participants than the previous(inner) ring.

	BASED ON ABOVE INFORMATION ANSWER THE FOLLOWING QUESTIONS (i) If the first ring had place for 30 participants, how many dancers will be there in the 10th row? (ii) In how many circles will 1500 dancers dance as per this arrangement? (iii) How many dancers will be left out after 12th row? (OR) Suppose there are 13 circles of dancers, how many dancers are there in the middle ring?
38.	The Statue of Unity is a colossal statue of Independence activist Sardar Vallabh bhai Patel (1875–1950), who was the first Deputy Prime Minister and Home minister of independent India. Patel was highly respected for his leadership in uniting the 562 princely states of India to form the single Union of India. It is located in the state of Gujarat, India. It is the world's tallest statue with a height of (597 ft) 182m. It is located on a river facing the Sardar Sarovar Dam on river Narmada in Kevadiya colony, 100 km southeast of the city of Vadodara and 150 km from Surat.  BASED ON ABOVE INFORMATION ANSWER THE FOLLOWING QUESTIONS: (i) Find the angle of elevation of top of the statue from a point on ground at 182 m. (ii) A person of height of 2 m makes an angle of 60^{o} from the top of statue, then the distance of that person from the bottom of statue is? (iii)If at any given instant a person at the top of the statue observes the shadow to be of length $182\sqrt{3}$ m, then what is the angle of depression from his eyes? **(OR)** What will be the length of wire required to connect the top of the statue to a point 364m away from the foot of the statue?