KENDRIYA VIDYALAYA SANGATHAN, GURUGRAM REGION

PRE- BOARD I EXAMINATION 2025 -26

Class : X **Max Marks: 80**

Subject : Mathematics (Standard) **Time: 3 Hrs**

General Instructions:

Read the following instructions carefully and follow them:

1. This question paper contains 38 questions. All Questions are compulsory.

2. This Question Paper is divided into 5 Sections A, B, C, D and E.

3. In Section A- Question numbers 1-18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion- Reason based questions of 1 mark each.

4. In Section B, Question numbers 21-25 are very short answer (VSA) type questions, carrying 02 marks each.

5. In Section C, Question numbers 26-31 are short answer (SA) type questions, carrying 03 marks each.

6. In Section D, Question numbers 32-35 are long answer (LA) type questions, carrying 05 marks each.

7. In Section E, Question numbers 36-38 are case study-based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.

8. There is no overall choice. However, an internal choice in 2 questions of Section B, 2 questions of Section C and 2 questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.

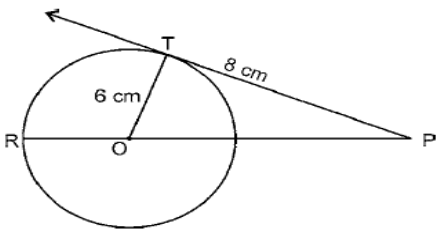
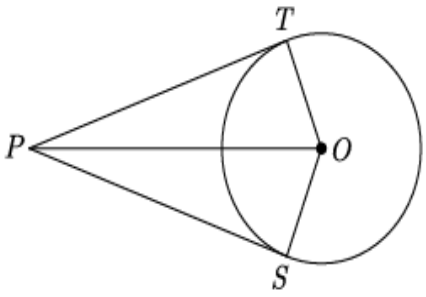
9. Draw neat and clean figures wherever required. Take π = 22 7

10. Use of calculators is not allowed.

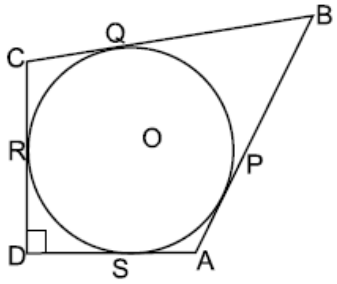
Section A

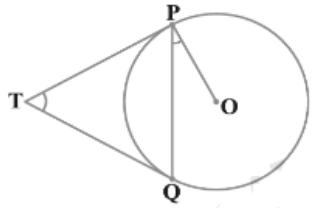
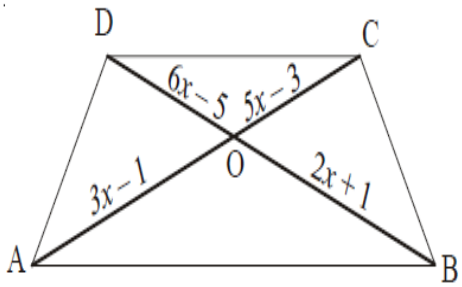
Section A consists of 20 questions of 1 mark each.

Q. No	**Questions**	**Marks**
1	IF HCF of 144 and 180 is expressed in the form 13n – 16. Find the value of n. (a) 1 (b) 2 (c) 3 (d) 4	**1**
2	Prime factors of the denominator of a rational number with decimal expansion 2212.1887 are: (a) 2,3 (b) 2,3,5 (c) 2,5 (d) None of these	**1**
3	If α and β are the zeroes of the polynomial, $9x^2 - 1$, then the value of $\alpha + \beta$ is (a) $\frac{-1}{9}$ (b) 1 (c) -1 (d) 0	**1**

4	The value of k for which the system of linear equations: $4x + 2y = 3$, $(k-1)x - 6y = 9$ is inconsistent: (a) –13 (b) 9 (c) –11 (d) 13	**1**
5	If the quadratic equation $ax^2 + 2bx + c = 0$ has two real and equal roots, then c is equal to (a) $\frac{b^2}{4a}$ (b) $\frac{b^2}{2a}$ (c) $\frac{b^2}{a}$ (d) $\frac{2b^2}{4a}$	**1**
6	If $\Delta ABC \sim \Delta LMN$ and perimeter of the triangles ABC and LMN are 60 cm and 48 cm respectively. If LM = 8 cm, length of AB is: (a) 10 cm (b) 8 cm (c) 5 cm (d) 6 cm	**1**
7	The distance of the point P (- 3, - 4) from the x-axis (in units) is (a) 3 (b) - 3 (c) 4 (d) – 4	**1**
8	If P $\left(\frac{a}{2,}, 4\right)$ is the mid-point of the line segment joining the points A (- 6, 5) and B (- 2, 3), then the value of a is (a) 8 (b) - 8 (c) – 16 (d) 16	**1**
9	If Cosec θ – Cot θ = m, then the value of $\frac{1}{\text{Cosec}\,\theta + \text{Cot}\,\theta}$ is …… (a) $\frac{1}{m}$ (b) $-\frac{1}{m}$ (c) m (d) $\frac{1}{m}$ - 1	**1**
10	If sin $\alpha = \frac{1}{2}$ and cos $\beta = \frac{1}{2}$, then the value of Sin $(\alpha + \beta)$ is (a) $\frac{1}{\sqrt{2}}$ (b) 0 (c) 1 (d) None of these	**1**
11	In the figure, find the length of PR. (a) 10 cm (b) 16 cm (c) 12 cm (d) 14 cm 	**1**
12	In the figure, In a circle with centre O and PS and PT be two tangents and the angle between the both the radius of a circle is a right angle, then what is the name of the figure PSOT. (a) Kite (b) Rhombus (c) Rectangle (d) Square 	**1**

13	If circumference of a circle is numerically equal to the area of a circle, then diameter of the circle is (a) $\frac{\pi}{2}$ (b) 2 π (c) 4 (d) 2	**1**
14	An arc of length 15.7 cm subtends a right angle at the centre of the circle. The radius of the circle is (Use π = 3.14) (a) 20 cm (b) 10 cm (c) 15 cm (d) 12 cm	**1**
15	What is the ratio between the height of cylinder h and radius of sphere r, which just encloses a sphere. (a) h = r (b) h = 2r (c) 2h = r (d) h = 3r	**1**
16	If Median of a data is 33 and mode is 45, then find the mean of the data. (a) 26 (b) 9 (c) 27 (d) 79	**1**
17	An event is very unlikely to happen. Its probability is closest to: (a) 0.0001 (b) 0.001 (c) 0.01 (d) 0.1	**1**
18	The probability of getting a bad egg from a lot of 600 eggs is 0.025. The number of bad eggs in the lot is (a) 18 (b) 14 (c) 15 (d) 16	**1**
	DIRECTIONS: In the question number 19 and 20, a statement of **Assertion (A)** is followed by a statement of **Reason (R)**. **Choose the correct option**: (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.	
19	**Assertion**: If Δ ABC is right angled at C, then the value of cos (A + B) is 0. **Reason**: Angle A and B are complementary angles.	**1**
20	**Assertion**: The HCF and LCM of two natural numbers are 825 and 25 respectively. **Reason**: LCM of two numbers is always divisible by their HCF.	**1**

	SECTION B **Section B consists of 5 questions of 2 marks each**	
21	For what value of k will the consecutive terms, 2k + 1, 3k+ 3 and 5k - 1 form an AP? **OR** Check whether 100 is a term of the AP …, …, ..., 25, 28, 31 or not.	**2**
22	If AD and PM are medians of triangles ABC and PQR, respectively where $\Delta ABC \sim \Delta PQR$, then prove that AB x PM = AD x PQ.	**2**
23	If $\frac{3}{4}\tan^2 30° - 2\sin^4 60° + 2\tan 45° = x^2 \sin^3 30°$, find the value of x.	**2**
24	If a quadrant is cut off from the circle of area 154 cm^2, then find the circumference of the remaining portion? **OR** A chord 10 cm long is drawn in a circle whose radius is $5\sqrt{2}$ cm. Find the area of minor segment.	**2**
25	In the figure, ∠ADC = 90°, BC = 38 cm, CD = 28 cm and BP = 25 cm. Find the radius of the circle. 	**2**
	SECTION C **Section C consists of 6 questions of 3 marks each**	
26	Given that $\sqrt{7}$ is irrational, prove that $7 - 2\sqrt{7}$ is irrational.	**3**
27	The students of a class are made to stand in rows. If 3 students are extra in a row, there would be 1 row less. If 3 students are less in a row, there would be 2 rows more. Find the number of students in the class. **OR** A railway half ticket costs half the full fare, but the reservation charges are the same on a half ticket as on a full ticket. One reserved first-class ticket from station A to B costs Rs 2530. One reserved first-class ticket and one reserved first-class half ticket from stations A to B costs Rs 3810. Find the full first-class fare from stations A to B and also the reservation charges for a ticket.	**3**
28	If the zeroes of the quadratic polynomial $x^2 + (a + 1)x + b$ are 2 and – 3, find the value of a and b.	**3**

29	Cards marked with numbers 3, 4, 5, ...50 are placed in a bag and mixed thoroughly. One card is drawn at random from the bag. Find the probability that number on the card drawn is: (i) Divisible by 7. (ii) A perfect square. (iii) Prime number less than 35.	**3**
30	If sin θ+ cos θ = $\sqrt{3}$, then prove that tan θ + cot θ = 1 **OR** If x = 3 Sinθ + 4 Cosθ and y = 3 Cosθ - 4 Sinθ, then find the value of $\sqrt{x^2 + y^2}$.	**3**
31	Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that ∠ PTQ = 2 ∠ OPQ.  	**3**
	SECTION D **Section D consists of 4 questions of 5 marks each**	
32	A girl is twice as old as her sister. Four years hence, the product of their ages (in years) will be 160. Find their present ages.	**5**
33	State and prove basic proportionality theorem. In the given fig., AB || DC and diagonals AC and BD intersect at O. If OA = 3x – 1 and OB = 2x + 1, OC = 5x – 3 and OD = 6x – 5, find the value of x.  	**5**
34	Suchant has a vessel, in the form of an inverted cone, opens at the top of height 11cm and radius of top 2.5 cm and is full of water. Metallic spherical balls, each of diameter 0.5 cm are put in the vessel due to which $\frac{2}{5}$ th of the water in the vessel flows out. Find how many balls were put in the vessel. **OR** From a solid cylinder whose height is 24 cm and diameter is 20 cm, a conical cavity of same height and same diameter is hollowed out. Find the total surface area of the remaining solid.	**5**

35 The distribution below gives the weights of 30 students of a class. Find the median weight of the students when the maximum weight of students is 75 kg. **5**

Weight (in kg)	Above 40	Above 45	Above 50	Above 55	Above 60	Above 65	Above 70
Number of students	30	28	25	17	11	5	2

OR

The mean of the following distribution is 31.4. Determine the missing frequency x.

Class	0 -1 0	10 – 20	20 – 30	30 – 40	40 – 50	50 - 60
Frequency	5	x	10	12	7	8

After finding the value find the mode for the above data.

SECTION E (Case Study Questions)
Section E consists of 3 questions of 4 marks each

36 In a pathology lab, a culture test has been conducted. In the test, the number of bacteria taken into consideration in various samples is all 3-digit numbers that are divisible by 6, taken in order. **4**



Based on the above information, solve the following questions:

i). How many bacteria are considered in the sixth sample?

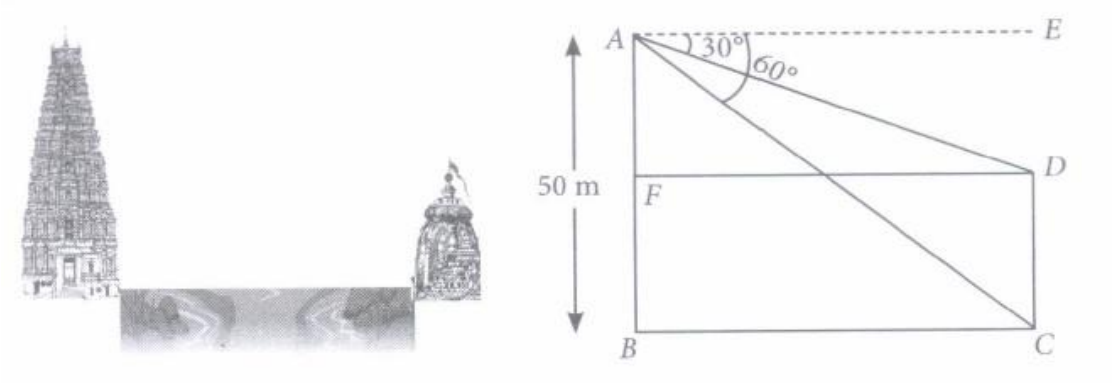
ii). How many samples were taken into consideration by the lab?

iii). Find the total number of bacteria taken in the first 15 samples.

OR

Find the number of samples in which sum of bacteria taken for consideration is 570.

37 There are two temples on each bank of a river. One temple is 50 m high. A man, who is standing on the top of 50 m high temple, observed from the top that angle of depression of the top and foot of other temple are 30° and 60° respectively. **4**



Based on the above information, answer the following questions. (1 + 2 + 1)

(i) What is the measure of ∠ADF and ∠ACB ? 1

(ii) Boat travels in a straight line from temple at B to temple at C, then how much distance man needs to travel between the temples? 2

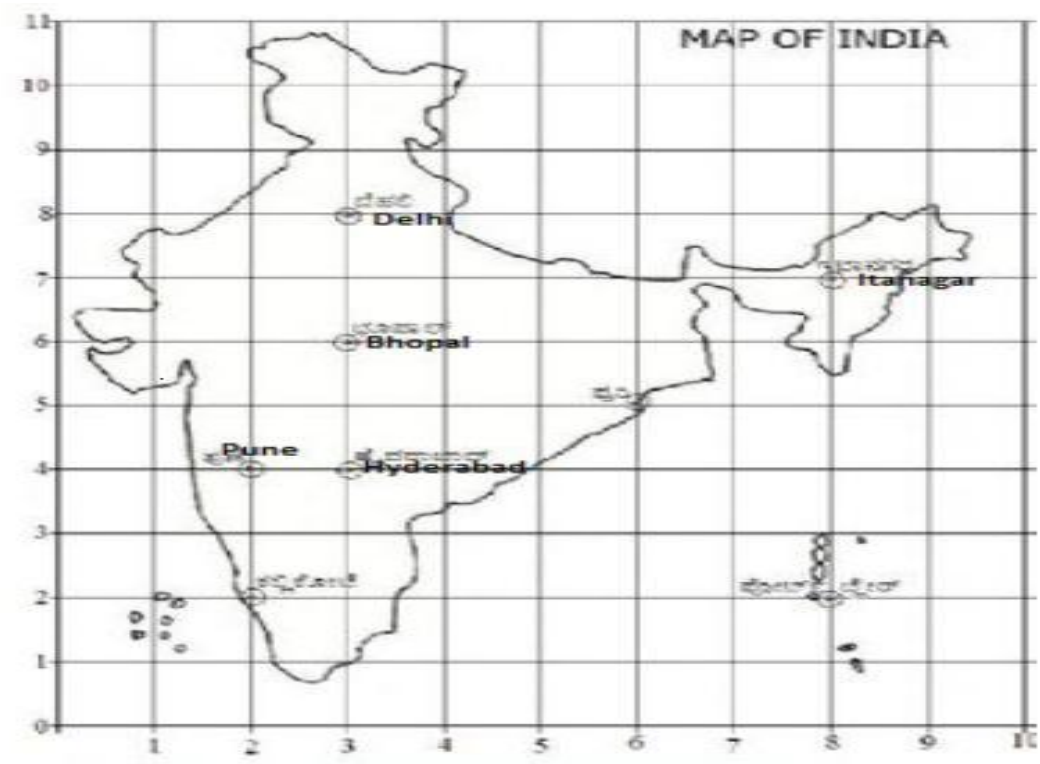
OR

What is the distance between the top of the first temple and the foot of the second temple?

(iii) What is the height of the smaller/other temple? 1

38 Observe the map and answer the following question. (1 + 2 + 1) **4**

India is officially known as the Republic of India. It comprises of a total of 28 states along with eight union territories. India is the second most populated country in the world and the world's largest democracy.



(i) What is the distance between Delhi and Itanagar? 1

(ii) An Air India fly from Hyderabad to Itanagar takes 7 hours at an uniform speed. What is the distance it will cover in half time of his journey. 2

OR

Which location is more closer to Delhi, Pune or Itanagar. Explain by Calculating distance.

(iii) Considering Bhopal to be Origin of Tourism and horizontal and vertical lines be x-axis and Y-axis respectively, write the co-ordinates of all the cities. 1

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