KENDRIYA VIDYALAYA SANGATHAN,   TINSUKIA REGION
FIRST PRE BOARD 2025-26
CLASS- X
MATHEMATICS BASIC (241)

Time : 3 hours   **Max Marks : 80**
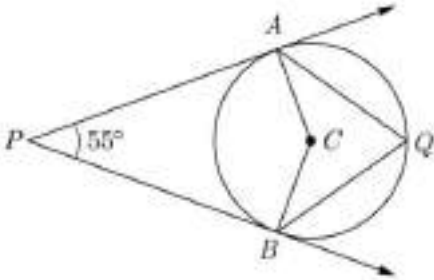
General Instructions

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 numbers1-18 are multiple choice questions (MCQs) and question 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 subparts 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 $\pi = \frac{22}{7}$ wherever required if not stated.
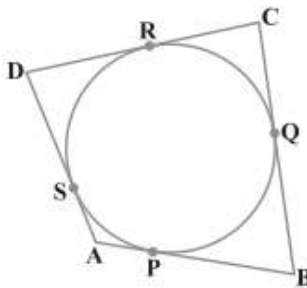10. Use of calculators is not allowed.

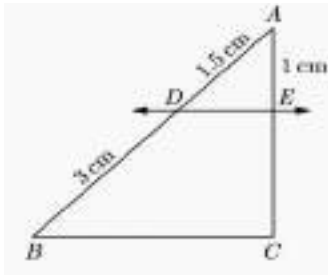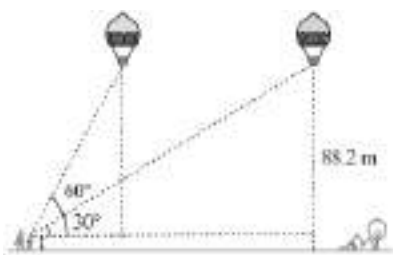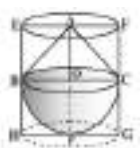|	SECTION- A **(Multiple Choice Questions)** *Each MCQ of 1 mark , has four options with only one correct option , choose the correct option*	
Q. No.	Question	Marks
Q.1	The ratio of HCF to LCM of the least composite number and least prime number is A) 1 : 2 B) 2 :1 C) 1 :1 D) 1 :3	1

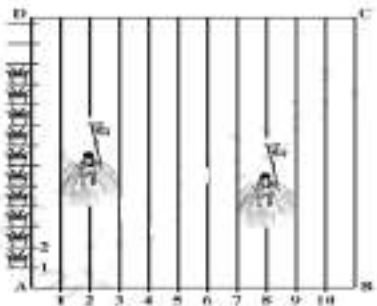| Q.2	Which of the following are the zeroes of the polynomial p (x) = $2x^3-11x^2+17x-6$	1
	A) 2 B) 3 C) $\frac{1}{2}$ D) Above all	
Q.3	The value of k for which the pair of linear equations 3x+5y=8 and kx+15y=24 has infinitely many solutions , is A) 3 B) 9 C) 5 D) 15	1
Q.4	Which of the following is **not** a quadratic equation? A) $2(x-1)^2= 4x^2-2x + 1$ B) $2x-x^2= x^2 + 5$ C) $(\sqrt{2}x+\sqrt{3})^2 + x^2= 3x^2-5x$ D) $(x^2+2x)^2 = x^4+3+4x^3$	1
Q.5	The first term of an AP is p and the common difference is q then its 10th term is A) q + 9p B) p-9q C) p+9q D) 2p+9q	1
Q.6	Which term of AP is 21,42,63,84, … is 210 A) 9 B) 10 C) 11 D) 12	1
Q.7	The distance of the point (-1,7) from x-axis is A) -1 B) 7 C) 6 D) $\sqrt{50}$	1
Q.8	The line segment joining the points P(-3,2) and Q(5,7) is divided by the y-axis in the ratio A) 3:1 B) 3:4 C) 3:2 D) 3:5	1

Q.9	Which of the following statement is false?	1
	A) All equilateral triangles are similar	
	B) All isosceles triangles are similar	
	C) All squares are similar	
	D) All circles are similar	
Q.10	Which of the following criteria is not suitable for $\triangle ABC$ is similar to $\triangle PQR$	1
	A) SAS	
	B) AAA	
	C) SSS	
	D) RHS	
Q.11	In the given figure PA and PB are tangents from external point to a circle with centre C and Q is any point the circle then measure of $\angle ACB$ is	1
	A) 55°	
	B) 62.5°	
	C) 90°	
	D) 125°	
Q.12	From an external point Q, the length of tangent to a circle is 12 cm and the distance of Q from the centre of circle is 13 cm. The radius of circle (in cm) is	1
	A) 10	
	B) 5	
	C) 12	
	D) 7	
Q.13	The median and mode respectively of a frequency distribution are 26 and 29, then its mean is	1
	A) 27.5	
	B) 24.5	
	C) 28.4	
	D) 25.8	

Q.14	If secA – tanA = m, then the value of secA + tanA is A) $1-\frac{1}{m}$ B) m^2-1 C) $\frac{1}{m}$ D) $-m$	1
Q. 15	Two dice are rolled together. The probability of getting sum of numbers on the two dice as 2, 3 or 5, is : A) $\frac{7}{36}$ B) $\frac{11}{36}$ C) $\frac{5}{36}$ D) $\frac{4}{9}$	1
Q.16	How many tangents can be drawn to a circle from a point on it. A) 1 B) 2 C) Infinite D) 0	1
Q.17	The circumferences of two circles are in the ratio 4: 5.The ratio of their radii is A) 16:25 B) 25:16 C) 2:5 D) 4:5	1
Q.18	The middle most observation of every data arranged in ascending or descending order is called A) Mode B) Median C) Mean D) Deviation	1

	Each of the following questions contains two statements i.e., ASSERTION and REASON, and has following four choices. Only one of which is the correct answer.	
Q.19	**ASSERTION (A)**: The perimeters of two similar triangles are 25 cm and 15 cm respectively. If one side of the first triangle is 9cm, then the corresponding side of the second triangle is 5.4 cm. **REASON(R)**: The ratio of the perimeters of two similar triangles is the same as the ratio of their corresponding sides. 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
Q.20	**ASSERTION(A)**: Probability of a sure event is 1. **REASON(R)**: For a sure event, number of favorable outcomes is less than the total number of outcomes. 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 **(Very Short Answers)** *This section comprises of VSA of 2marks each*	
Q.21	Show that the number $2 \times 5 \times 7 \times 11 + 11 \times 13$ is a composite number. OR Given that HCF (306 ,1314) = 18 , Find LCM (306 ,1314) .	2
Q.22	Find the zeroes of quadratic polynomial $3x^2$-x-4., and verify the relationship between the zeroes and the coefficients .	2
Q.23	Evaluate: $\dfrac{5cos^2 60 + 4sec^2 30 - tan^2 45}{sin^2 30 + cos^2 30}$ — **OR** Prove that : $\dfrac{tan^2\theta}{1+tan^2\theta} + \dfrac{cot^2\theta}{1+cot^2\theta} = 1$	2
Q.24	Find the nature of the roots of the following quadratic equations. If the real roots exist, find them: $2x^2 - 3x + 5 = 0$.	2

Q.25	A quadrilateral ABCD is drawn to circumscribe a circle, prove that AB + CD = AD + BC	2

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SECTION – C
(Short Answers)
This section comprises of SA type questions of 3 marks each

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Q.26	Given that $\sqrt{3}$ is an irrational number , show that $(5 + 2\sqrt{3})$ is an irrational number.	3
Q.27	The mean of the following frequency distribution is 25, find the value of x :	3

Class	0-10	10-20	20-30	30-40	40-50
Frequency	5	18	15	x	6

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OR

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The median of the following frequency distribution is 25, find the value of x.

Class	0-10	10-20	20-30	30-40	40-50
Frequency	6	9	10	8	X

Q.28	Prove that the lengths of tangents drawn from an external point to a circle are equal.	3
Q.29	The sum of the first 7 terms of an AP is 63 and that of its next 7 terms is 161. Find the AP?	3
Q.30	Prove that $\sqrt{\frac{1-sin\theta}{1+sin\theta}} = sec\theta - tan\theta.$	3
Q.31	If we add 1 to the numerator and subtract 1 from the denominator a fraction reduces to 1, it becomes ½ if we only add 1 to the denominator. What is the fraction?	3

	SECTION – D **(Long Answers)** *This section comprises of LA type questions of 5 marks each*	5
Q.32	State and prove the Basic Proportionality Theorem. In the given figure DE ∥ BC, what is the value of EC. 	5
Q.33	Find the value of p for which the quadratic equation $(p + 1)x^2 - 6(p + 1)x + 3(p + 9) = 0$, $p \neq -1$ has equal roots. Hence find the roots of the equation.	5
Q.34	From the top of a building 15m high the angle of elevation of the top of tower is found to be 30°. From the bottom of same building ; the angle of elevation of the top of the tower is found to be 60°. Find the height of the tower and the distance between tower and building . OR A 1.2 m tall girl spots a balloon moving with the wind in a horizontal line at a height of 88.2 m from the ground. The angle of elevation of the balloon from the eyes of the girl at any instant is 60°. After some time, the angle of elevation reduces to 30°. Find the distance travelled by the balloon during the interval. 	5
Q.35	A solid toy is in the form of a hemisphere surmounted by a right circular cone. The height of the cone is 2 cm and the diameter of the base is 4 cm. Determine the volume of the toy. If a right circular cylinder circumscribes the toy, find the difference of the volumes of the cylinder and the toy. (Take $\pi = 3.14$) 	5

	SECTION – E **(Case – Study Based Questions)** *This section comprises of 3 case - study based questions of 4 marks each with three sub- parts*	

Q.36	To conduct Sports Day activities, in your rectangular shaped school ground ABCD, lines have been drawn with chalk powder at a distance of 1m each. 100 flower pots have been placed at a distance of 1m from each other along AD, as shown in Figure. Niharika runs ¼ th the distance AD on the 2nd line and posts a green flag. Preet runs 1/5 th the distance AD on the eighth line and posts a red flag.
	
	    (i) What will be the coordinates of green flag?
	    (ii) What is the distance between green and red flags?
	    (iii) If Rashmi has to post a blue flag exactly halfway between the line segment joining the two flags, where should she post her flag?
		1
		1
		
		2

Q.37	To promote cooperation, culture, creativity, sharing, self- confidence, and other social values, a student adventure camp was organized by the school for class-X students and their accommodation was planned in tents .The teacher divides the students into groups, each group off our students was given to prepare a conical tent of radius 7 m and canvas of area 551 m^2 in which 1 m^2 is used in stitching and wasting of canvas:
	    (i) Find the curved surface of conical tent.
	    (ii) Find the height of the conical tent.
	    (iii) Find the cost of canvas required for making the tent, if the canvas cost Rs. 70 per sq. m
		1
		1
		
		2

Q.38	Ruby and Rita are playing a game of ludo with 2 dice. (i)To win a game,Ruby wanted a total of 7.What is the probability of winning a game by Ruby? (ii)To win a game, Rita wanted 8 as the sum. What is the probability of winning a game by Rita? (iii)What is the probability that the sum of the numbers on the both the dice is divisible by 4 or 6 ?.	1 1 2