SET-2

KENDRIYA VIDYALAYA SANGATHAN: HYDERABAD REGION
PREBOARD-1(2024-25)

CLASS-X MAX.MARKS:80
MATHEMATICS TIME:3hrs

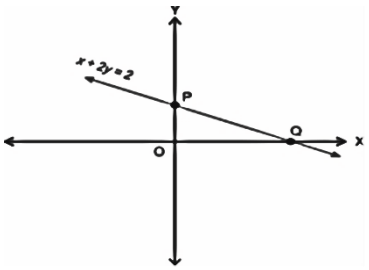
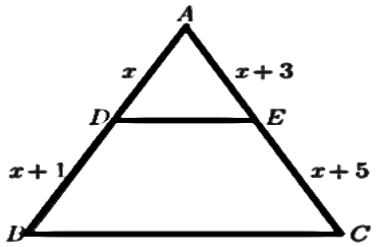
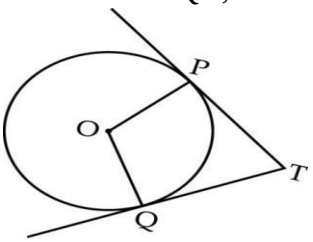
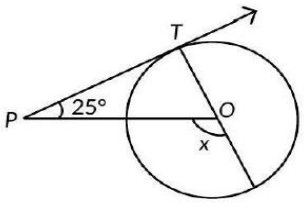
General Instructions:

1. This Question Paper has 5 Sections A, B, C, D and E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with subparts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks,2 Qs of 3marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E
8. Draw neat figures wherever required. Take $\pi = \frac{22}{7}$ wherever required if not stated.

SECTION-A

Section A consists of 20 questions of 1 mark each.

1	Rahul has 40cm long red and 84 cm long blue ribbon. He cuts each ribbon into pieces such that all pieces are of equal length. the length of each piece is _____ cm A) 40 B) 12 C) 8 D) 4	1
2	$p\ and\ q$ are the zeroes of the polynomial $2x^2 + 5x - 4$, evaluate $(1-p)(1-q)$. A) $\frac{3}{2}$ B) $-\frac{3}{2}$ C) 3, D) -3	1
3	The value of k for which the quadratic equation $2x^2 - 10x + k = 0$ has equal roots. A) $\frac{25}{2}$ B) $\frac{1}{5}$ C) $-\frac{5}{2}$ D) $\frac{1}{2}$	1
4	The pair of linear equations -$6x - 2y = 21\ and\ 2x - 3y + 7 = 0$ represents A) coincident lines B) intersecting lines C) parallel lines D) intersecting lines in two pints	1
5	If 18, *x*, *y*, -3 are in A.P., then value of *x*+*y* is : A) 11 B) 12 C) 15 D) 18	1
6	If the first three terms of an AP are $3p-1, 3p+5$ and $5p+1$ respectively, then the value of p is A)2 B) 5 C) 4 D) -3	1

7	The line $x + 2y = 2$ forms a triangle OPQ with coordinate axes. Then the coordinates of point P are A) (2,2) B) (1, 1) C) (0,1) D) (2,0) 	1
8	The distance of the point (4,7) from the x-axis is _____ A) 4 units B) 5 units C) 6 units D) 7 units	1
9	The value of $2\sin^2 30^0 - 3\cos^2 45^0 + \tan^2 60^0 + \sin 90^0$ is A)1 B) 2 C) 3 D) 4	1
10	If $Cos\ A = 0$ and $then\ the\ value\ of\ \frac{1}{2}\ Sin\ \frac{A}{2}$ is _____ A) 0 B) $\frac{1}{2}$ C) $\frac{1}{\sqrt{2}}$ D) $\frac{1}{2\sqrt{2}}$	1
11	The height of a tower is 20m. The length of its shadow made on the level ground when the Sun's altitude is 60°, A) 60m B) $\frac{20\sqrt{3}}{3}$ m C) $20\sqrt{3}$ m D) 20m	1
12	In ΔABC, if DE ∥ BC, then the value of x is _____ A) 1 B) 2 C) 3 D) 4 	1
13	In the given fig. PT and QT are tangents to a circle with centre O such that PO ⊥ QO, then ∠PTQ is equal to A) 100° B) 90° C) 110° D) 80° 	1
14	In the given figure, PT is a tangent at T to the circle with Centre O. If ∠TPO = 25°, then x is equal to _____ A) 25° B) 65° C) 90° D)115° 	1
15	OACB is a quadrant of a circle with Centre O and radius 7 cm where ACB is the arc. Then the perimeter of the quadrant is : A) 15cm B) 50cm C) 44cm D) 25cm	1

16	If the area of the circle is 154 m^2, then its perimeter is _____ A) 11 m B) 22 m C) 44m D) 55 m	1
17	In a frequency distribution, the mid value of a class is 10 and the width of the class is 6. The lower limit of the class is A) 6 B) 8 C) 7 D) 9	1
18	The probability of getting prime number on throwing a dice is A) 0 B) 1 C) $\frac{1}{3}$ D) $\frac{1}{2}$	1

In question numbers 19 and 20 a statement of assertion(A) is followed by a statement of Reason (R). Choose the correct option.

A) Both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

B) Both Assertion and Reason are correct but Reason is not the correct explanation of Assertion.

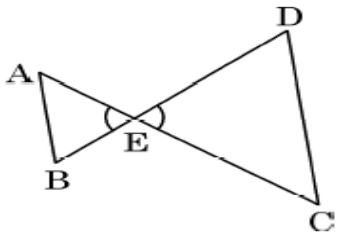
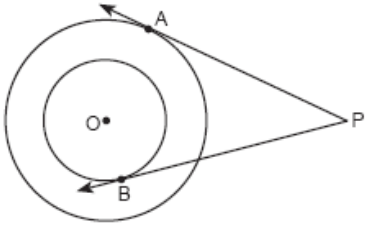
C) Assertion is correct but Reason is incorrect.

D) Assertion is incorrect but Reason is correct.

19	**ASSERTION**: - Two cubes each of edge length $10cm$ are joined end to end to form a Cuboid. The surface area of the resulting cuboid is 1200 cm^2 **REASON** :- Area of each surface of a cube of side 10cm is 100 cm^2.	1
20	**ASSERTION**: - In a cricket match, a batsman hits a boundary 9 times out of 45 balls he plays. The probability that in each ball he does not hit a boundary is $\frac{4}{5}$ **REASON :-** P(E) +P(not E) = 1	1

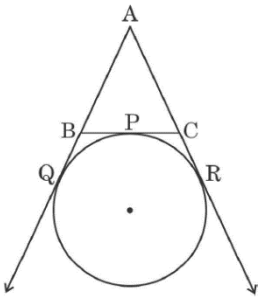
SECTION-B

Section B consists of 5 questions of 2 mark each.

21	The HCF (65, 117) is 13. Find their LCM.	2
22	If $\tan\theta = \frac{1}{\sqrt{7}}$, then show that $\frac{\text{cosec}^2\,\theta - \sec^2\theta}{\text{cosec}^2\,\theta + \sec^2\theta} = \frac{3}{4}$ (OR) If $\sin(A-B) = \frac{1}{2}$, $\cos(A+B) = \frac{1}{2}$; $0 < A+B \leq 90^0$, $A > B$. Find $\angle A$ and $\angle B$	2
23	In the given figure, $\frac{EA}{EC} = \frac{EB}{ED}$, prove that $\Delta EAB \sim \Delta ECD$ 	2
24	In figure, there are two concentric circles, with centre O and of radii 5 cm and 3 cm. From an external point P, tangents PA and PB are drawn to these circles. If AP = 12 cm, find the length of BP. 	2
25	Find the area of a quadrant of a circle whose radius is 14cm.	2

SECTION-C

Section C consists of 6questions of 3 mark each.

26	Prove that $\sqrt{5}$ is irrational	3
27	Find the quadratic polynomial, sum and product of whose zeros are -1 and -20 respectively. Also find its zeroes.	3
28	Find the values of k if quadratic equation, has equal roots. $2x^2 + kx + 3 = 0$	3
29	Prove that $secA(1 - sinA)(secA + tanA) = 1$	3
30	A Circle is touching the side BC of a ΔABC At the point P and touching AB and AC produced at points Q and R respectively. Prove that AQ $= \frac{1}{2}$(Perimeter of ΔABC) (OR) The tangents drawn to a circle from an external point are equal.  	3
31	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) 5? (ii) 10? (iii) at least 9?	3

Section -D

Section D consists of 4 questions of 5 marks each

32	Solve the equations $x - y + 1 = 0$ and $3x + 2y - 12 = 0$ graphically. Also find the area of the triangle formed by the lines and x axis.	5
33	Prove that "If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio."	5
34	A solid iron pole consists of a cylinder of height 220 cm and base diameter 24 cm, which is surmounted by another cylinder of height 60 cm and radius 8 cm. Find the mass of the pole, given that 1 cm^3 of iron has approximately 8g mass. (Use π= 3.14) (OR) A solid consisting of a right circular cone of height 120 cm and radius 60 cm standing on a hemisphere of radius 60 cm is placed upright in a right circular cylinder full of water such that it touches the bottom. Find the volume of water left in the cylinder, if the radius of the cylinder is 60 cm and its height is 180 cm.	5
35	The median of the following data is 137. Find the values of x and y, If the total frequency is 68.	5

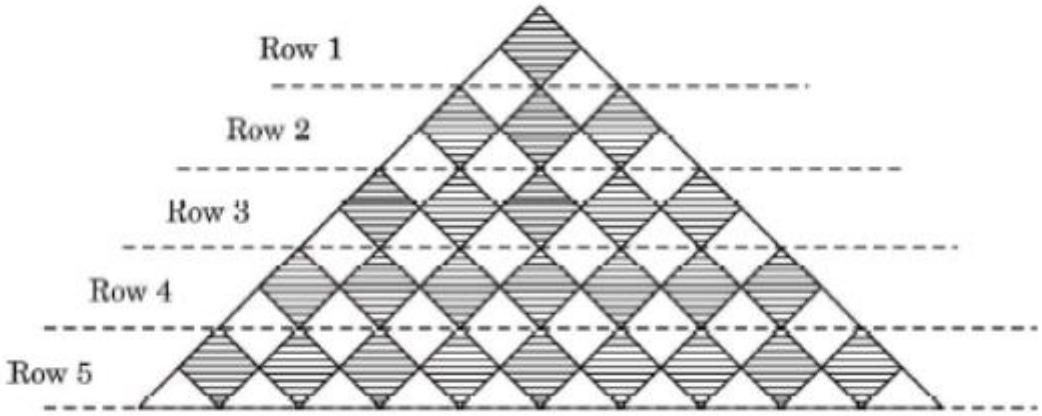
Class intervals	65 – 85	85 – 105	105 –125	125 -145	145 – 165	165 – 185	185 – 205
Frequency	4	x	13	20	14	y	4

SECTION-E (Case Study Based Questions)

Questions 36 to 38 carry 4 marks each

36

A fashion designer is designing a fabric pattern. In each row, there are Some shaded squares and unshaded triangles.



Based on the above, answer the following questions:

(i) Identify A.P. for the number of squares in each row. — 1

(ii) Identify A.P. for the number of triangles in each row. — 1

(iii) (a) If each shaded square is of side 2 cm, then find the shaded area when 15 rows have been designed. — 2

OR

(iii) (b) Write a formula for finding total number of triangles in 'n' number of rows. Hence, find S_{10}. — 2

37

Totem poles are made from large trees. These poles are carved with symbols or figures and mostly found in western Canada and northwestern United States.

In the given picture, two such poles of equal heights are standing 28 m apart. From a point somewhere between them in the same line, the angles of elevation of the top of the two poles are 60° and 30° respectively.

Based on the above information answer the following questions:

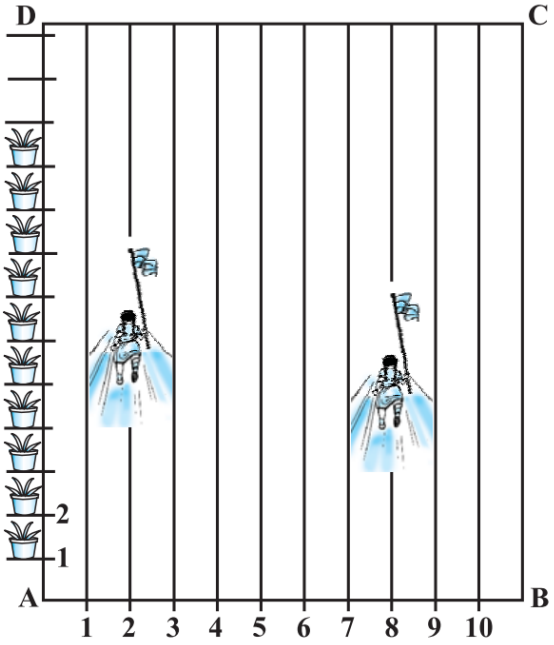
(i) Draw a neat labelled diagram — 1

(ii) (a) Find the height of the poles. — 2

(OR)

(b) If The distance of the top of the poles from the point of observation are taken as p and q, then find a relation between p and q. — 2

(iii) Find the location of the point of observation. — 1

38	To conduct Sports Day activities, in your rectangular shaped school ground ABCD, lines have been drawn with chalk powder at 1m each. 100 flower pots have been placed at 1m from each other along AD, as shown in Figure. Niharika runs $\frac{1}{4}$th of the distance AD on the 2nd line and posts a green flag. Preet runs $\frac{1}{5}$th the distance AD on the eighth line and posts a red flag. Assume A as the origin AB along x-axis and AD along y-axis, answer the following questions: Based on the above information answer the following questions  (i) Find the coordinates of the green flag. (ii) Find the distance between both the flags? (iii) (a) If Rashmi has to post a blue flag exactly halfway between the line segment joining the two flags, where should she post her flag? OR (b) If position of green flag is named as P and that of red flag as Q, then find the ratio in which R $(4, \frac{45}{2})$ divides the join of PQ.	1 1 2 or 2