

PRELIMINARY EXAMINATION: 2024-2025

CLASS : X

SUBJECT : MATHEMATICS

NAME OF STUDENT:-----

MAX. MARKS: 80

DATE:-----

TIME: 3 HOURS

NOTE: You will not be allowed to write during the first 15 minutes. This time is to be spent in reading the question paper. The time given at the head of this paper is the time allowed for writing the answers. Attempt all questions from Section A and any four questions from Section B.

Section: A [40marks]

(Attempt all questions from this Section)

Q1. Choose the correct answers to the questions from the given options:

[15]

(i) If $(2x+1)$ is a factor of $6x^3 + 5x^2 + ax - 2$, then the value of 'a' is

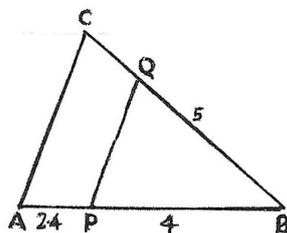
- (a) 3 (b) -3
(c) 2 (d) -2

(ii) Radha deposited Rs400 per month in a recurring deposit account for 18 months.

The qualifying sum of money for the calculation of interest is:

- (a) Rs 3600 (b) Rs 7200
(c) Rs 68,400 (d) Rs 1,36,800

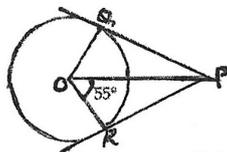
(iii) In the adjoining figure, $PQ \parallel AC$ and all lengths are given in centimetres. The length of BC is



- (a) 6.4 cm (b) 7.4 cm
(c) 8 cm (d) 9 cm

(iv) In the adjoining figure, PQ and PR are tangents from P to a circle with center O.

If $\angle POR = 55^\circ$ then $\angle QPR$ is

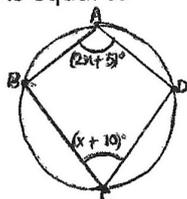


- (a) 35° (b) 55°
(c) 70° (d) 80°

(v) The number of two digit numbers are in A.P. which are divisible by 3 is

- (a) 33 (b) 31
(c) 30 (d) 29

(vi) In the adjoining figure, ABCD is a cyclic quadrilateral. If $\angle BAD = (2x + 5)^\circ$ and $\angle BCD = (x + 10)^\circ$, then x is equal to



- (a) 65 (b) 45
(c) 55 (d) 50

(vii) The volume of a conical tent is 462m^3 and the area of the base is 154m^2 . The height of the conical tent is:

- (a) 15m (b) 12m
(c) 9m (d) 24m

(viii) A point is invariant with respect to both x-axis and y-axis

Assertion(A): It is invariant with respect to origin also.

Reason(R): The point is origin itself.

- (a) (A) is true, (R) is false. (b) (A) is false, (R) is true.
(c) Both (A) and (R) are true. (d) Both (A) and (R) are false.

(ix) The probability of getting a bad egg in a lot of 400 eggs is 0.035. The number of bad eggs in the lot is

- (a) 7 (b) 14
(c) 21 (d) 28

(x) If the lines $2x + 3y = 5$ and $kx - 6y = 7$ are parallel, then the value of k is

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

(xi) $\frac{1+\tan^2 A}{1+\cot^2 A}$

- (a) $\sec^2 A$ (b) -1
(c) $\cot^2 A$ (d) $\tan^2 A$

(xii) If $A = \begin{bmatrix} 2 & -2 \\ -2 & 2 \end{bmatrix}$, then $A^2 = pA$, then the value of p is

- (a) 2 (b) 4
(c) -2 (d) -4

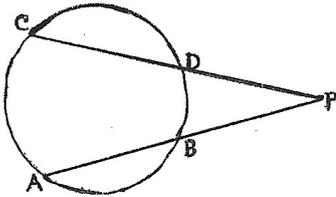
(xiii) If Nisha invests Rs 19200 on Rs 50 shares at a premium of 20%, then the no of shares she buys is

- (a) 640 (b) 384
(c) 320 (d) 160

(xiv) The probability of getting a number divisible by 3 in throwing a die is

- (a) $\frac{1}{6}$ (b) $\frac{1}{3}$
(c) $\frac{1}{2}$ (d) $\frac{2}{3}$

(xv) Two chords AB and CD of a circle intersect externally at a point P. If PC = 15cm, CD = 7cm and AP = 12cm, then AB is



- (a) 2cm (b) 4cm
(c) 6cm (d) none of these

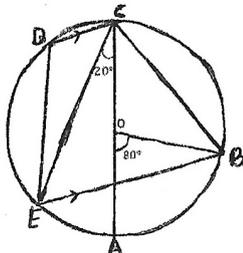
Q2.(i) If $(x-2)$ is a factor of the expression $2x^3 + ax^2 + bx - 14$ and when the expression is divided by $(x-3)$, it leaves a remainder 52, find the values of a and b. [4]

(ii) The vertices of a ΔABC are $A(3,8)$, $B(-1,2)$ and $C(6,-6)$. Find :

- (a) slope of BC. [4]
(b) equation of a line perpendicular to BC and passing through A. [4]

(iii) In the given figure AC is the diameter of the circle with center O.

CD is parallel to BE. $\angle AOB = 80^\circ$ and $\angle ACE = 20^\circ$. Calculate [4]



- (a) $\angle BEC$ (b) $\angle BCD$ (c) $\angle CED$

- Q3.(i)** The sum of some terms of a G.P. is 315 whose first term and the common ratio are 5 and 2 respectively. Find the last term and the number of terms. [4]
- (ii)** A circus tent is in the shape of a cylinder surmounted by a cone. The diameter of the cylindrical portion is 24m and its height is 11m. If the vertex of the cone is 16m above the ground, find the area of the canvas used to make the tent. [4]
- (iii)** Use a graph paper, for this question. Plot the points P(3,2) and Q(-3,-2). From P and Q, draw perpendiculars PM and QN on the x-axis. [5]
- (a) Name the image of P on reflection in the origin.
 (b) Assign the special name to the geometrical figure PMQN and find its area.
 (c) Write the coordinates of the point to which M is mapped on reflection in
 (i) x-axis (ii) y-axis (iii) origin.

Section B

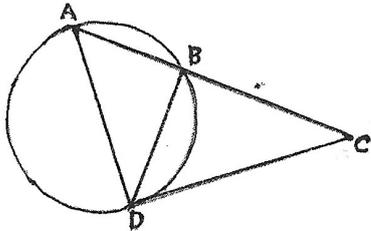
(Attempt any four questions from this Section)

- Q4.(i)** A man invests Rs 4500 in shares of a company which is paying 7.5% dividend. If Rs 100 shares are available at a discount of 10%, find (a) the number of shares he purchases. (b) his annual income. [3]
- (ii)** Solve the following inequation, write down the solution set and represent it on the number line:
 $-2 + 10x \leq 13x + 10 < 24 + 10x, x \in \mathbb{I}$. [3]
- (iii)** Prove the following trigonometry identity:
 $\sin\theta (1 + \tan\theta) + \cos\theta (1 + \cot\theta) = \sec\theta + \operatorname{cosec}\theta$ [4]
- Q5.(i)** Prove that a cyclic parallelogram is a rectangle. [3]
- (ii)** Haneef has a cumulative bank account and deposits Rs 300 per month for two years. If he received Rs 7725 at the time of maturity, find the rate of interest per annum. [3]
- (iii)** The following table gives the daily wages of workers in a factory: [4]

Wages in Rs	45-50	50-55	55-60	60-65	65-70	70-75	75-80
No. of workers	5	8	30	25	14	12	6

Calculate their mean by short cut method.

- Q6.(i)** Find the equation of the line through the point P(-5,1) and parallel to the line joining the points A(7,-1) and B(0,3). [3]
- (ii)** In the adjoining figure, CBA is a secant and CD is tangent to the circle. [3]



If AB = 7cm and BC = 9cm, then

- (a) Prove that $\triangle ACD \sim \triangle DCB$.
 (b) Find the length of CD. [4]
- (iii)** Mr. Bedi visits the market and buys the following articles: [4]
- Medicines costing Rs 950, GST @ 5%
 A pair of shoes costing Rs 3000, GST @ 18%
 A laptop bag costing Rs 1000 with a discount of 30% , GST @ 18%
- (a) Calculate the total amount of GST paid.
 (b) The total bill amount including GST paid by Mr. Bedi.
- Q7.(i)** The angle of elevation of the top of a hill at the foot of a tower is 60° and the angle of depression from the top of the tower of the foot of the hill is 30° . If the tower is 50m high, find the height of the hill. [4]
- (ii)** The marks of 200 students in a test were recorded as follows: [6]

Marks %	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. of students	5	7	11	20	40	52	36	15	9	5

Using graph sheet draw an ogive for the given data and use it to find the,

- (a) median,
 (b) number of students who obtained more than 65% marks

(c) number of students who did not pass, if the pass percentage was 35.

Q8.(i) A bag contains 15 balls of which some are white and others are red. If the probability of drawing a red ball is twice that of a white ball, find the number of white balls in the bag. [3]

(ii) A solid spherical ball of radius 6cm is melted and recast into 64 identical spherical marbles. Find the radius of each marble. [3]

(iii) If $\frac{7m+2n}{7m-2n} = \frac{5}{3}$, use properties of proportion to find [4]

(a) $m:n$ (b) $\frac{m^2+n^2}{m^2-n^2}$

Q9.(i) In a school, the weekly pocket money of 50 students is as follows: [3]

Weekly pocket money (in Rs)	40-50	50-60	60-70	70-80	80-90	90-100
No. of students	2	8	12	14	8	6

Draw a histogram on a graph paper and find the mode from the graph.

(ii) The first term of an A.P. is -5 and the last term is 45. If the sum of the terms of the A.P. is 120, then find the number of terms and the common difference. [3]

(iii) Solve the equation $5x^2 - 3x - 4 = 0$ and give your answer correct to 3 significant figures. [4]

Q10.(i) A bus covers a distance of 240 km at a uniform speed. Due to heavy rain its speed gets reduced by 10km/hr and as such it takes two hours longer to cover the total distance. Assuming the uniform speed to be 'x' km/hr, form an equation and solve it to evaluate x. [3]

(ii) If $2 \begin{bmatrix} x & 7 \\ 9 & y-5 \end{bmatrix} + \begin{bmatrix} 6 & -7 \\ 4 & 5 \end{bmatrix} = \begin{bmatrix} 10 & 7 \\ 22 & 15 \end{bmatrix}$, find the values of x and y. [3]

(iii) Using ruler and compasses only: [4]

(a) Construct a triangle ABC with $BC = 6\text{cm}$, $\angle ABC = 120^\circ$ and $AB = 3.5\text{cm}$.

(b) In the above figure, draw a circle with BC as diameter. Find a point 'P' on the circumference of the circle which is equidistant from AB and BC.

(c) Measure $\angle BCP$.

END