

PRE - BOARD EXAMINATION 2024 – 25
CLASS – X
SUBJECT – MATHEMATICS

Maximum Marks: 80

Time allowed: Two and half hours

Answers to this Paper must be written on the paper provided separately.

You will not be allowed to write during 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.
All working, including rough work, must be clearly shown and must be done on the same sheet as rest of the answer.

Omission of essential working will result in loss of marks.

The intended marks for questions or parts of questions are given in brackets [].

Mathematical tables and graph papers are provided.

SECTION A

NOTE: Attempt ALL questions from this section

Question.1

[15 × 1 = 15 Marks]

Choose the correct answer:

- i. If $P = \begin{bmatrix} 1 & 2 \\ 2 & 4 \end{bmatrix}$ The order of matrix P is:
a) 1×1 b) 2×2 c) 1×2 d) 2×1
- ii. The value of k for the quadratic equation $x^2 - kx + 4 = 0$ to have real and equal roots is:
a) $\sqrt{2}$ b) $\sqrt{4}$ c) 5 d) 3
- iii. Amit sold a chair to Raman at ₹ 4000 GST charge @ 18% the price paid by Raman is Rupees:
a) 4018 b) 4500 c) 4000 d) 4720
- iv. Mr. Sharma deposits ₹ 500 every month for three and a half year in the bank of India at the rate of interest as 8% p.a. What will be his total investment?
a) ₹ 1750 b) ₹ 21,000 c) ₹ 3010 d) ₹ 24,010
- v. **Statement 1:** The probability that the Sun will rise from west tomorrow is 1.
Statement 2: The probability that it will rain on Monday is 1.
Which of the following is valid?
a) both the statements are true b) both the statements are false
c) statement 1 is true but statement 2 is false d) statement 1 is false and statement 2 is true
- vi. Which of the following equations represent a line passing through origin
a) $5x - 7y + 5 = 0$ b) $y = -4$ c) $x = 7$ d) $3x - 7y = 0$
- vii. The reflection of (0, -2) in the line $x = 2$ is?
a) (-4, -2) b) (1, -1) c) (0, 4) d) (4, -2).
- viii. In the given figure triangle ABC is similar to triangle EDF by the criteria:



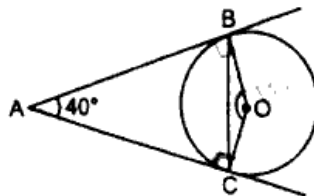
a)SSS

b)SAS

c)AAS

d)AAA

- ix. In the given figure, AB and AC are tangents to the circle with centre O such that $\angle BAC = 40^\circ$. then $\angle OBC$ is equal to:



- x. If 84 is the n th term of the arithmetic progression 21, 28, 35, 42, ... then 'n' is
 a) 11 b) 14 c) 9 d) 10
- xi. Median marks from the given data is:

Marks	25	50	35	65	45	70
No. of Students	6	15	12	10	18	9

- xii. A cylinder and a cone are of same base radius and of same height. The ratio of the volume of the cylinder to that of the cone is
 a) 2 : 1 b) 3 : 1 c) 2 : 3 d) 3 : 2
- xiii. If x, 12, 8 and 32 are in continued proportion, then the value of x is:
 a) 6 b) 4 c) 3 d) 2

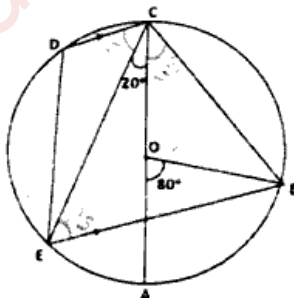
- xiv. The value of $\sin^4 A - \cos^4 A$ is equal to:

a) $2\sin^2 A - 1$ b) $2\cos^2 A - 1$ c) $\sin^2 A + \cos^2 A$ d) $2\cos^2 A + 1$

- xv. A man invested ₹10320 on ₹100 shares at a discount of ₹14. Number of shares bought by him is
 a) 120 b) 110 c) 100 d) 95

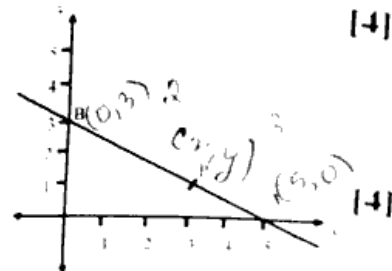
Question 2.

- i. Saanvi has a recurring deposit account and deposits ₹900 per month for 2 years if she gets ₹1800 as interest at the time of maturity, find the rate of interest. [4]
- ii. The third term of G.P is 4. Find the product of first five terms. [4]
- iii. In the given figure AC is the diameter of the circle with centre O. CD is parallel to BE. Given that $\angle AOB = 80^\circ$ and $\angle ACE = 20^\circ$. Calculate:
 (a) $\angle BEC$ (b) $\angle BCD$ (c) $\angle CED$ [4]



Question 3

- i. The radius and height of a right circular cone are in the ratio 5:12 and its volume is 2512 cubic cm. Find the radius and slant height of the cone. (Take $\pi = 3.14$) [4]
- ii. From the given figure:
 a) Write down the coordinates of A and B.
 b) If P divides AB in the ratio 2:3, find the coordinates of point P.
 c) Find the equation of a line parallel to line AB and passing through origin. [4]



- iii. Plot the points A (3, 5) and B (-2, -4). Use 1 cm = 1 unit on both the axes.
- A' is the image of A when reflected in the x-axis. Write down the co-ordinates of A' and plot it on the graph paper.
 - B' is the image of B when reflected in the y-axis, followed by reflection in the origin. Write down the co-ordinates of B' and plot it on the graph paper.
 - Write down the geometrical name of the figure AA'BB'A. [5]

SECTION B

(Attempt ANY FOUR questions from this Section.)

Question 4.

- i. The ages of 40 students are given in the following table. Find the arithmetic mean. [3]

Age (in yrs)	12	13	14	15	16	17	18
Frequency	2	4	6	9	8	7	4

- ii. A dice is rolled two times. Find the probability of getting:

a) a total of at least 9

b) a doublet

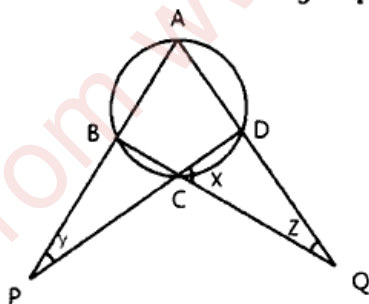
c) prime number on both the dice [3]

- iii. A registered Company computer engineer provides computer maintenance services to five different companies. He offers different discounts to different companies depending upon their payment terms. If the rate of GST at 18%. calculate the output GST for the computer engineer. [4]

Company	C1	C2	C3	C4	C5
SERVICE COST (₹)	10,200	12,100	13,600	10,000	12,500
DISCOUNT	30%	25%	20%	15%	10%

Question 5.

- i. Solve the equation $3x^2 - x - 7 = 0$ and give your answer correct to two decimal place. [3]
- ii. In the following figure, calculate the values of x, y and z if: $\frac{x}{3} = \frac{y}{4} = \frac{z}{5}$ [3]



- iii. A person on tour has ₹ 4200 for his expenses. If he extends his tour by three days, he has to cut his daily expenses by ₹ 70. Find his original duration of the tour. [4]

Question 6.

- i. Prove the identity: $\frac{\cos\theta \cot\theta}{1+\sin\theta} = \operatorname{cosec}\theta - 1$ [3]
- ii. Solve and graph the solution set of $13x - 5 \leq 15x + 4 < 7x + 12$; where $x \in \mathbb{R}$. [3]
- iii. A man invests ₹ 8000 in shares of a company which pays 15% dividend at a time when a ₹ 35 shares costs ₹40. Find:
- the number of shares he bought.
 - the annual income from his shares.
 - the rate of interest which he gets on his investment. [4]

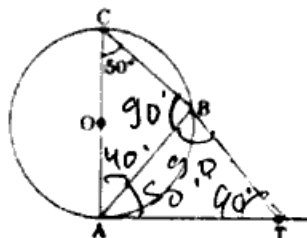
Question 7.

- i. The sum of n terms of an A.P is $n^2 + 3n$. Find its 14th term. [3]
- ii. Given: $x = \frac{\sqrt{a^2+b^2} + \sqrt{a^2-b^2}}{\sqrt{a^2+b^2} - \sqrt{a^2-b^2}}$ Using properties of proportion show that: $b^2x^2 - 2a^2x + b^2 = 0$. [3]

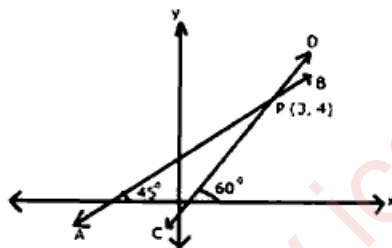
- iii. Two persons are standing on the opposite sides of a tower. They observe the angles of elevation of the top of the tower to be 30° and 38° respectively. Find the distance between them, if the height of the tower is 50 m. [4]

Question 8.

- i. Draw an inscribing circle of a regular hexagon of side 5.5 cm and mark its center as O. [3]
 ii. In fig., AB is a chord of the circle and AOC is its diameter such that $\angle ACB = 50^\circ$. If AT is the tangent to the circle at the point A, then find the measure of $\angle BAT$ and $\angle BTA$. [3]

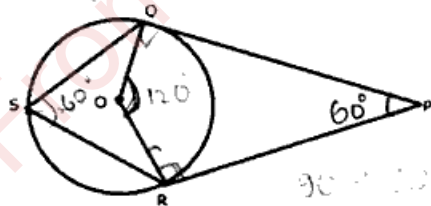


- iii. The figure given below shows two straight lines AB and CD intersecting each other at point P (3, 4). Find the equation of AB and CD. [4]



Question 9.

- i. Find the value of 'a', if $3x^3 - ax^2 + 5x - 13$ and $(a + 1)x^2 - 7x + 5$ leave the same remainder when each is divided by $x - 3$. [3]
 ii. Solve for x and y: $\begin{bmatrix} x + y & x - 4 \\ 2x & 2 \end{bmatrix} \begin{bmatrix} -1 & -2 \\ 2 & 2 \end{bmatrix} = \begin{bmatrix} -7 & -11 \end{bmatrix}$ [3]
 iii. In the following figure, PQ and PR are tangents to the circle, with centre O. If $\angle P$ is 60° . Calculate:
 a) $\angle QOR$ b) $\angle OQR$ c) $\angle QSR$ [4]



Question 10.

- i. Use ruler and compasses for the following question taking a scale of 10 m = 1 cm. A park in a city is bounded by straight fences AB, BC, CD and DA. Given that AB = 50 m, BC = 63 m, $\angle ABC = 75^\circ$. D is a point equidistant from the fences AB and BC. If $\angle BAD = 90^\circ$, construct the outline of the park ABCD. Also locate a point P on the line BD for the flag post which is equidistant from the corners of the park A and B. [4]
 ii. The following data represents the daily wages in rupees of a certain number of employees of a company:

Daily Wages (₹)	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110
No. of employees	8	14	12	17	20	26	13	10

Use a graph to answer the following questions:

- a) Represent the above distribution by an ogive.
 b) Using ogive drawn by you, estimate:
 1. median wage.
 2. percentage of employees who earn more than ₹ 84 per day.
 3. number of employees who earn ₹ 56 and below.