

PRE BOARD – I (2025 – 26)
MATHEMATICS (GRADE X)

Maximum Marks: 80
Time allowed : 3 hours

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

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.

All working, including rough work, must be clearly shown and must be done on the same sheet as the 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 bracket.

SECTION A (40 Marks)

(Attempt all questions from this Section)

Question. 1 Choose the correct answers to the questions from the given options :

[15]

i) Salman has some shares of Rs.50 of a company paying 15% dividend. If his annual income is Rs.3000, then the number of shares he possesses is ,

a) 80

b) 400

c) 600

d) 800

ii) The greatest integer which is such that if 7 is added to its double, the resulting number becomes greater than three times the integer is,

a) 4

b) 5

c) 6

d) 7

iii) **Statement 1** : The quadratic equation $2x^2 - \sqrt{5}x + 1 = 0$ has no real roots.

Statement 2 : The quadratic equation $2x^2 + 3x + 1 = 0$ has equal roots.

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 but Statement 2 is true.

iv) If the polynomial $x^3 + ax^2 + bx + 6$ leaves the same remainders when divided by $(x - 1)$ and $(x+2)$, then the relation between a and b is,

a) $a - b - 3 = 0$

b) $a + b - 3 = 0$

c) $a + b + 3 = 0$

d) $a - b + 3 = 0$.

v) If $a : b = 9 : 10$, then the value of $\frac{2a^2 - 3b^2}{2a^2 + 3b^2}$ is,

a) $-\frac{23}{77}$

b) $\frac{23}{77}$

c) $\frac{24}{99}$

d) $-\frac{24}{99}$

vi) If $\begin{bmatrix} x & 3x \\ y & 4y \end{bmatrix} \begin{bmatrix} 2 \\ 1 \end{bmatrix} = \begin{bmatrix} 5 \\ 12 \end{bmatrix}$, then the value of x is ,

a) $x = 2, y = 3$

b) $x = -2, y = 3$

c) $x = 1, y = 2$

d) $x = 1, y = -2$

vii) In G.P., the sum of the first n terms is 364, the first term is 1 and the common ratio is 3. The value of n is,
 a) 4 b) 5 c) 6 d) 8

viii) In the following figure, $MN \perp QR$, if $PN = 3.6$ cm, $NR = 2.4$ cm and $PQ = 5$ cm, then PM is .



a) 4 cm b) 3.6 cm c) 2 cm d) 3 cm

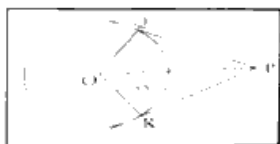
ix) The co-ordinates of the image of the point $A(-3, 4)$, when reflected in the line $x = 2$, followed by reflection in the line $y = 1$ is,

a) (6, -2) b) (6, -1) c) (7, -1) d) (7, -2)

x) The slope of a line perpendicular to the line $3x = 4y + 11$ is,

a) $\frac{3}{4}$ b) $-\frac{3}{4}$ c) $\frac{4}{3}$ d) $-\frac{4}{3}$

xi) In the following figure, PQ and PR are tangents from P to a circle with centre O . If $\angle POR = 55^\circ$, then $\angle QPR$ is,



a) 35° b) 55° c) 70° d) 80°

xii) The number of balls of radius 1cm that can be made from a sphere of radius 10 cm is,

a) 100 b) 1000 c) 10000 d) 100000

xiii) The sum of money required to buy 50, Rs. 40 shares at Rs. 38.50 is :

a) Rs. 1920 b) Rs. 1924 c) Rs. 1925 d) Rs. 1952

xiv) Given that the sum of the squares of the first seven natural numbers is 140, then their mean is :

a) 20 b) 70 c) 280 d) 980

xv) $A = \begin{bmatrix} 3 & -2 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 4 \\ 2 & 0 \end{bmatrix}$

Assertion (A) : Product AB of the two matrices A and B is possible.

Reason (R) : Number of columns of matrix A is equal to number of rows in matrix B .

a) A is true, R is false c) Both A and R are true and R is the correct reason for A
 b) A is false, R is true d) Both A and R are true and R is the incorrect reason for A .

Question : 2

i) For the following frequency distribution, draw a histogram. Hence, calculate the mode.

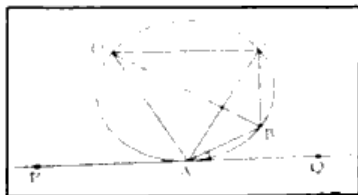
[4]

| | | | | | | |
|-----------|-------|--------|---------|---------|---------|---------|
| Class | 0 - 5 | 5 - 10 | 10 - 15 | 15 - 20 | 20 - 25 | 25 - 30 |
| Frequency | 2 | 7 | 18 | 10 | 8 | 5 |

ii) Beena has a cumulative deposit account of Rs. 400 per month at 10% per annum simple interest. If

she gets Rs. 30100 at the time of maturity, find the total time for which the account was held. [4]

iii) In the following figure, PQ is a tangent to the circle at A. AB and AD are bisectors of $\angle CAQ$ and $\angle PAC$ respectively. If $\angle BAQ=30^\circ$, prove that: i) BD is the diameter of the circle. ii) ABC is an isosceles triangle. [4]



Question. 3

i) From a solid cylinder of height 30cm and radius 7cm, a conical cavity of height 24 cm and of base radius 7cm is drilled out. Find the volume and the total surface area of the remaining solid. [4]

ii) Construct a ΔABC , given that $AB = 4.5$ cm, $BC = 7$ cm and median $AD = 4$ cm. Construct inscribed circle of ΔABC and measure its radius. [4]

iii) For this question, use a graph paper. Scale: 1cm = 1unit along both x and y-axis.) [5]

Plot points A (0,3), B (4,0), C (6,2) and D (5,0).

Reflect the points as given below and write their coordinates:

(a) Reflect A on x-axis to A'. (b) Reflect B on y- axis to B'. (c) Reflect C on x-axis to C'.

(d) D remain invariant when reflected on the line whose equation is _____.

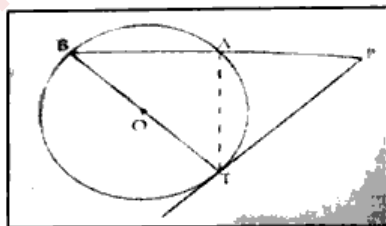
(e) Join the points A,B,C,D,C',B,A', B' and A to form a closed figure. Name the closed figure BCDC'.

SECTION B (40 Marks)

(Attempt any four questions from this Section)

Question. 4

i) In the following figure, PAB is a secant and PT a tangent to the circle with centre O. If $\angle ATP= 40^\circ$, $PA = 9$ cm and $AB = 7$ cm. Find a) $\angle APT$ b) length of PT. [3]



ii) Two different dice are thrown simultaneously. What is the probability that the sum of two numbers appearing on the top of dice is : i) 8 ii) 10 iii) atleast 10 ? [3]

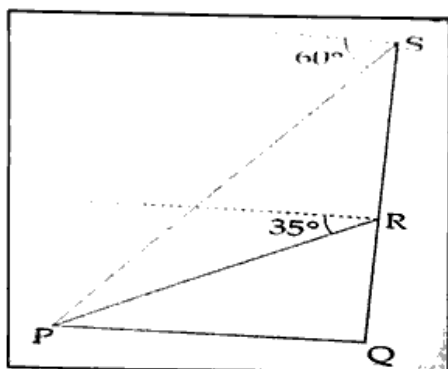
iii) If $A = \begin{bmatrix} 3 & -1 \\ 0 & 2 \end{bmatrix}$, find matrix B such that $A^2 - 2B = 3A + 5I$, where I is a 2 X 2 matrix. [4]

Question. 5

i) The deer population is increasing in a national park. In year 2020 it was 1000, since then it has been increasing and it becomes 2 times every year. Find the population in 2025. [3]

ii) A shopkeeper bought an article with market price Rs. 1200 from the wholesaler at a discount of 10%. The shopkeeper sells this article to the customer on the market price printed on it. If the rate of GST is 6%, then find: a) GST paid by the wholesaler. b) Amount paid by the customer to buy the item. [3]

iii) A drone camera is used to shoot an object P from two different positions R and S along the same vertical line QRS. The angle of depression of the object P from these two positions are 35° and 60° respectively as shown in the diagram. If the distance of the object P from point Q is 50 metres, then find the distance between R and S correct to the nearest metre. [4]



Question. 6

i) Using properties of proportion, solve for x. Given that x is positive: $\frac{2x + \sqrt{4x^2 - 1}}{2x - \sqrt{4x^2 - 1}} = 4$ [3]

ii) If P(9a - 2, -b) divides the line segment joining A(3a + 1, -3) and B(8a, 5) in the ratio 3 : 1, find the values of a and b. [3]

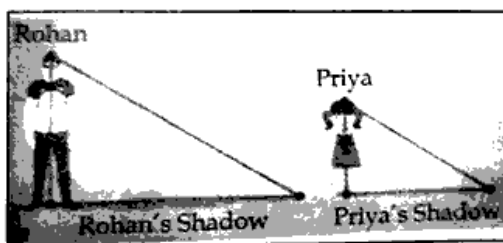
iii) A cylindrical flagpole 4.9 m high and 3.5 cm in radius is surmounted on either side by a cone 0.60 m high. Find the volume and surface area of the pole. [4]

Question. 7

i) Find the equation of a line passing through the points (2,-3) and (3,2). Show that point (4, 7) lies on the line. [3]

ii) Prove that : $\frac{\cos A}{1 - \tan A} + \frac{\sin A}{1 - \cot A} = \cos A + \sin A$ [3]

iii) Rohan and his younger sister, Priya are enjoying a sunny afternoon in their backyard. Rohan, who is taller, notices that both he and Priya cast distinct shadows on the ground. He wonders if he can use this observation to understand something about their heights without directly measuring them by using the properties of similar triangles. [4]



Based on above information answer the following questions.

a) Rohan's height is 1.8 metres and his shadow length is 2.7 metres .If Priya's shadow length is 1.5 metres, then find Priya's height.

b) If a flagpole casts a shadow of 12 metres at the same time Rohan measured his shadow, what would be the approximate height of the flagpole ?

Question. 8

i) The following bill shows the GST rate and the marked price of articles :

[4]

| Rajdhani Departmental Store | | | | |
|-----------------------------|--------------------------|--------------|----------|-------------|
| S. No. | Item | Marked price | Discount | Rate of GST |
| a) | Dry fruits (1 kg) | Rs. 1200 | Rs. 100 | 12 % |
| b) | Packed wheat flour(5 kg) | Rs. 286 | No | 5 % |
| c) | Bakery products | Rs. 500 | 10 % | 12 % |

Find the total amount to be paid (including GST) for the above bill.

ii) If x, y and z are in continued propotion , prove that

[3]

$$\frac{x}{y^2 z^2} + \frac{y}{z^2 x^2} + \frac{z}{x^2 y^2} = \frac{1}{x^3} + \frac{1}{y^3} + \frac{1}{z^3}$$

iii) A man buys 250, ten rupee shares each at Rs. 12.50. If the rate of dividend is 7 % , find the : a) Dividend he receives annually . b) percentage return on his investment.

[3]

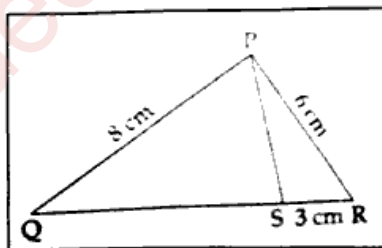
Question.9

i) In the adjoining figure,PQR is a triangle.S is a point on the side QR such that $\angle PSR = \angle QPR$. Given QP = 8 cm, PR = 6 cm and SR = 3 cm.

a) Prove that $\Delta PQR \sim \Delta SPR$.

b) Find the length of QR and PS.

[3]



ii) Find mean for the following frequency distribution :

[3]

| | | | | | | |
|-----------|--------|---------|---------|---------|---------|---------|
| Class | 0 - 15 | 15 - 30 | 30 - 45 | 45 - 60 | 60 - 75 | 75 - 90 |
| Frequency | 3 | 4 | 7 | 6 | 8 | 2 |

iii) Find the coordinates of the centroid P of the ΔABC , whose vertices are A(-1, 3) , B(3, -1) and C(0,0) . Hence , find the equation of a line passing through P and parallel to AB

[4]

Question. 10

i) (Use a ruler and a compass for this question.)

[5]

(a) Construct a triangle ABC such that $BC = 8\text{cm}$, $AC = 10\text{cm}$ and $\angle ABC = 90^\circ$.

(b) Construct an incircle to this triangle. Mark the centre as I.

(c) Measure and write the length of the in-radius.

(d) Measure and write the length of the tangents from vertex C to the incircle.

(e) Mark points P, Q and R where the incircle touches the sides AB, BC and AC of the triangle respectively. Write the relationship between $\angle RIQ$ and $\angle QCR$.

ii) Solve the given inequation, $\frac{11+3x}{5} \geq 3 - x > \frac{-3}{2}$, $x \in \mathbb{R}$

[5]

(a) Write the solution set.

(b) Represent the solution on the number line.

----- ALL THE BEST -----