

GREENLAWNS HIGH SCHOOL

STD 10

PRELIMINARY EXAMINATION 2025

80M

Time 3 hours

Mathematics

Attempt all questions from Section A and any four questions from Section B. All working including rough work must be clearly shown and done on the same page as the rest of the answer. Omission of essential steps will result in loss of marks.

SECTION A

(Attempt all questions from this section)

QUESTION 1

Choose the correct answers to the questions from the given options (15)

- i) Raj deposited Rs 2000 per month for one year in a recurring deposit account at 11% p.a. the money earned by Raj is

- a) Rs 24000
- b) Rs 25430
- c) Rs 1430
- d) Rs 715

- ii) The quadratic equation $4x^2 + px + 4 = 0$ has equal roots if the value of p is

- a) -8
- b) 4
- c) 8
- d) ± 8

- iii) If $\begin{bmatrix} 3 & 0 \\ 0 & 4 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 9 \\ -20 \end{bmatrix}$, the value of x and y respectively are

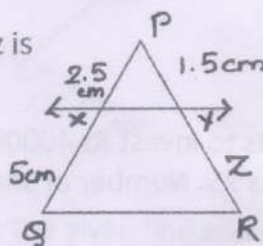
- a) 3, -5
- b) -5, 3
- c) 3, 5
- d) -3, -5

- iv) The inclination of a line whose equation is $y - \sqrt{3}x + 2 = 0$ is

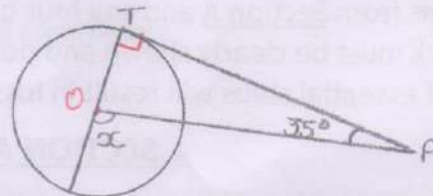
- a) 30°
- b) 60°
- c) 45°
- d) 90°

- v) In the given figure XY || QR the value of z is

- a) 2cm
- b) 3cm
- c) 4cm
- d) 5cm



- vi) In the given figure PT is a tangent to the circle with centre O, the value of x is
- a) 65°
 - b) 45°
 - c) 55°
 - d) 125°



- vii) An article is marked at Rs 1000. A dealer sells it to a consumer at 5% profit if the rate of GST is 18%, the tax paid by the consumer is
- a) Rs 9
 - b) Rs 50
 - c) Rs 189
 - d) Rs 180
- viii) The solution set for the inequation $2x + 5 \leq 15, x \in W$ is
- a) $\{1, 2, 3, 4, 5\}$
 - b) $\{0, 1, 2, 3, 4, 5\}$
 - c) $\{1, 2, 3, 4\}$
 - d) $\{0, 1, 2, 3, 4\}$
- ix) Identical cards having numbers between 4 and 15 are placed in a bag. A card is drawn at random. The probability that the card drawn is an odd number and a multiple of 3 is
- a) $\frac{1}{6}$
 - b) $\frac{7}{10}$
 - c) $\frac{2}{3}$
 - d) $\frac{1}{10}$
- x) $Q(3, 5)$ is reflected in line L_1 to get the image $Q'(7, 5)$, the equation of line L_1 is
- a) $X=3$
 - b) $Y=5$
 - c) $X=5$
 - d) $Y=3$
- xi) The volume of a cone is 770cm^3 if the area of the base is 154cm^2 then the height of the cone is
- a) 15cm
 - b) 5cm
 - c) 10cm
 - d) 12cm
- xii) Mr Shah wants to invest Rs 40000 in a company. He buys Rs 100 shares at a premium of Rs 25. Number of shares purchased by him are
- a) 400
 - b) 320
 - c) 1600
 - d) 1000

- xiii) The sides AB, BC and AC of $\triangle ABC$ touch the circle inscribed in it at P, Q and R respectively. If PA = 5cm, BP = 4cm, AC = 14cm then BC is
- 13cm
 - 14cm
 - 15cm
 - 16cm
- xiv) $\sin^2 \theta - \cot \theta \tan \theta + \cos^2 \theta =$
- 1
 - 2
 - 1
 - 0
- xv) Assertion: A cylinder and right circular cone have the same base and same height. The volume of the cylinder is three times the volume of the cone.
Reason: If the radius of the cylinder is doubled and the height is halved then the volume will be doubled.
- Both A & R are true and R is the correct explanation for A
 - Both A & R are true but R is not the correct explanation for A
 - A is true but R is false
 - A is false but R is true

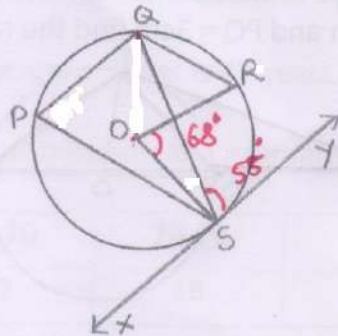
QUESTION 2

- a) The following bill shows the GST rates and discount offered on a few articles. (4)
Calculate the total amount to be paid for the bill

Article	Marked Price	Discount	GST
Hard Drive	Rs 2800	10%	18%
Adaptor	Rs 1900	-	28%

- b) In the given figure O is the centre of the circle, $\angle ROS = 68^\circ$ and $\angle QSY = 55^\circ$ (4)

- Find i) $\angle OSQ$
ii) $\angle SQR$
iii) $\angle QPS$
iv) $\angle QRS$



- c) The equation of a line is $2x - 3y + 7 = 0$, find (4)
- Slope of the line
 - Equation of the line perpendicular to the given line and passing through the intersection of the lines $x - y + 2 = 0$ & $3x + y - 10 = 0$

QUESTION 3

- a) Sixteen identical cards are labelled as a, b, c, ..., m, n, o, p. One card is drawn at Random what is the probability that the card drawn is (4)
- i) A vowel
 - ii) A consonant
 - iii) The vowel 'u'
 - iv) None of the letters of the word 'plane'
- b) Amit invested Rs 16800 in buying Rs 25 shares at a premium of Rs 5 *if div (4) is 9%*
Calculate i) the dividend earned by Amit ii) his percentage income
- c) Use a graph paper for this question (5)
Take 2 cm = 1 unit on both axes
- i) Plot A(0,5), B(2,3), C(4,3) and D(4,-2)
 - ii) Reflect B, C and D in the line x=0 to get B', C' and D' respectively. Write their coordinates
 - iii) Write the geometrical name for the figure ABCDD'C'B'
 - iv) Write the point which lies on the figure and is invariant in the x axis

SECTION B

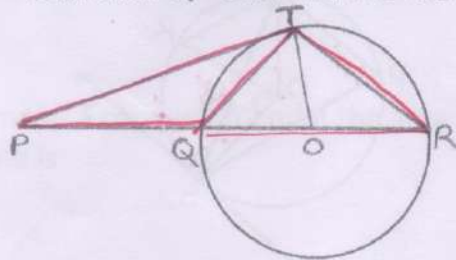
(Solve any 4 questions out of 7)

QUESTION 4

- a) Solve the following inequation and graph the solution on a real number line (3)

$$-2(x - 8) \geq 12 - 5x > \frac{x + 4}{3}, x \in Z$$

- b) In the given figure O is the centre of the circle. PT is tangent to the circle at T (3)
- i) Prove $\Delta PQT \sim \Delta PTR$
 - ii) If PT = 6cm and PQ = 3cm find the radius of the circle.

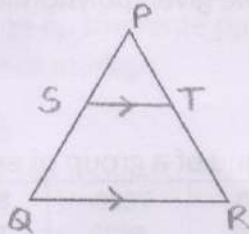


- c) If the mean of the following distribution is 113.2 and the sum of the Frequencies is 50, find 'a' and 'b' (4)

CI	90-100	100-110	110-120	120-130	130-140
f	12	a	8	b	5

QUESTION 5

- a) Solve the following quadratic equation and express your answer correct to 2 decimal places $x^2 - 8x - 3 = 0$ (3)
- b) In the given figure $ST \parallel QR$ & $PS:SQ = 3:4$ find $A(\Delta PQR) : A(\Delta PST)$ (3)



- c) The total amount deposited by Mr Mehta in a recurring account for 2 years is 60000. If the total deposit is eight times the interest earned by him then find
- The interest he earns
 - Monthly deposit
 - Rate of interest

QUESTION 6

- a) Two solid spheres of radii 4cm and 6cm are melted and recast into a cone of Height 7cm find the radius of the cone correct to the nearest whole number (3)
- b) Prove the following identity (3)
- $$\frac{\tan\theta + \sec\theta - 1}{\tan\theta - \sec\theta - 1} = \frac{1 + \sin\theta}{\cos\theta}$$
- c) Construct a circle with diameter 7cm. Mark point Q at a distance of 8cm from the Centre of the circle. Draw tangents from Q to this circle and record its radius (use a compass and ruler only) (4)

QUESTION 7

- a) The sum of n terms of a GP is 1533. The first term is 3 and common ratio is 2 find the number of terms. (3)
- b) The sum of the ages of Raj and his younger sister is 47 years. If the product Of their ages is 550, find their ages. (3)
- c) Draw a histogram for the following distribution and estimate its mode. Also Mention its Modal Class (4)

CI	50-60	60-70	70-80	80-90	90-100
f	8	12	18	14	10

QUESTION 8

- a) Using the properties of proportion solve for x (3)
- $$\frac{x^4 + 9}{6x^2} = \frac{5}{3}$$
- b) If $\begin{bmatrix} 2 & 3 \\ -1 & 0 \end{bmatrix} \times P = \begin{bmatrix} 7 \\ -2 \end{bmatrix}$, find matrix P (3)

- c) Using factor theorem show that $(x-2)$ is a factor of $x^3 + x^2 - 4x - 4$ (4)
Hence factorise the given polynomial completely.

QUESTION 9

- a) The monthly income of a group of employees in a company is given below (6)

Monthly income	6000-7000	7000-8000	8000-9000	9000-10000	10000-11000	11000-12000	12000-13000
No. of employees	20	45	65	95	60	30	5

Draw an ogive for the above distribution on a graph sheet taking 2cm = Rs 1000 on one axis and 2cm = 40 employees on the other axis. Use the ogive to find

- i) Median
- ii) Lower quartile
- iii) Number of employees whose income is below Rs 10500
- iv) Number of employees whose income is above Rs 11200

- b) From his hotel room Rajan notices some window cleaners on the opposite building (4)
Which is 60m away. If from Rajan's room the angle of elevation of the window cleaners is 60° and the angle of depression of the base of the building is 30°

Find

- i) How high is Rajan's room above the ground
- ii) How high are the window cleaners above the ground

QUESTION 10

- a) Calculate the ratio in which the line segment joining A(-4,2) and B(3,6) is divided by X(a,3) hence find 'a' (3)
- b) The 5th and 8th term of an AP is 4 and -8 respectively find the sum of the first 13 terms (3)
- c) Use a compass and ruler only (4)
- i) Construct ΔPQR such that $PQ = 4\text{cm}$ $QR = 6\text{cm}$ and $PR = 5.2\text{cm}$
 - ii) Draw a circle with QR as diameter. Find point T on the circumference of the Circle that is equidistant from PQ and QR
 - iii) Measure $\angle TQR$