GREENLAWNS SCHOOL, WORLI
PRELIM EXAM – 2026
MATHEMATICS

STD: X **Marks: 80**
Date:09/01/2026 **Time: 3hrs**

- Answers to this paper must be written on the paper provided separately.
- You will not be allowed to write during first 15 mins. This time is to be spent on reading the question paper.
- The time given at the head of the 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 brackets [ ]
- Mathematical tables and graph paper will be provided.

SECTION A
(Attempt all questions from this Section)

Question 1. Choose the correct answers to the questions from the options given. Write the correct answers only. **[15]**

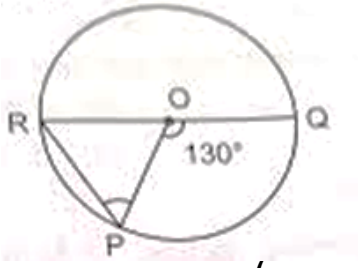
(i) If the equation $3x^2 - 6x + K = 0$ has real and distinct roots, then the value of k is:
(a) $k \leq 3$ **(b)** $k > 3$ **(c)** $k = 3$ **(d)** $k < 3$.

(ii) The matured value of a R.D. Account is ₹ 16,176. If the monthly instalment is ₹ 400/- and the rate of interest is 8% p.a., then the time of the R.D. account is:
(a) 1 year **(b)** 2 years **(c)** 3 years **(d)** 4 years

(iii) A letter is chosen at random from the letters of the word "SCHOOL". The probability that the letter is a Vowel is:
(a) $\frac{1}{6}$ **(b)** $\frac{1}{2}$ **(c)** $\frac{1}{3}$ **(d)** 1.

(iv) A point moves in such a manner that two times of its abscissa is greater by 4 than 3 times its ordinate, then the equation of the locus is:
(a) $3x + 2y = 4$ **(b)** $2x + 3y = 4$ **(c)** $3x - 2y = 4$ **(d)** $2x - 3y = 4$

(v) If $A = \begin{bmatrix} 2 & 3 \\ 7 & 5 \end{bmatrix}$ then, A^2 =?
(a) $\begin{bmatrix} 4 & 6 \\ 14 & 10 \end{bmatrix}$ **(b)** $\begin{bmatrix} 4 & 9 \\ 49 & 25 \end{bmatrix}$ **(c)** $\begin{bmatrix} 25 & 21 \\ 49 & 46 \end{bmatrix}$ **(d)** $\begin{bmatrix} 25 & 49 \\ 15 & 46 \end{bmatrix}$

(vi) 

O is the center of the circle and ∠POQ = 130°, then ∠OPR =?

(a) 45° **(b)** 75° **(c)** 65° **(d)** 55°

(vii) If both (x – 2) and $\left(x - \frac{1}{2}\right)$ are factors of $px^2 + 5x + r$ then:

(a) p = r **(b)** p = 2r **(c)** 2p = r **(d)** p = r + 2

(viii) Dividend is declared on:

(a) market value **(b)** face value **(c)** cash value **(d)** fair value

(ix) If the locus of a moving point which is always equidistant from points (2, -1) and (3, 2) then it represents the curve.

(a) Hyperbola **(b)** Ellipse **(c)** Circle **(d)** Straight line

(x) If p, q, and r are in continued proportion, then:

(a) $p : q = p : r$
(b) $q : r = p^2 : q^2$
(c) $p : q^2 = r : p^2$
(d) $p : r = p^2 : q^2$

(xi) In a cylinder, if the radius is one-fourth and height is halved then the volume will be,

(a) Doubled **(b)** 1/8 times **(c)** 1/16 times **(d)** 1/32 times

(xii) If $-1 < 3 + 4x \leq 23$, $x \in$ R (real numbers) then the solution set of x is:

(a) $-1 \leq x \leq 5$, $x \in$ R **(b)** $-1 < x \leq 5$, $x \in$ R
(c) $-1 \leq x \leq 5$, $x \in$ R **(d)** $-1 < x < 5$, $x \in$ R

(xiii) If 4x = 7y = 9z, then x: y: z is

(a) 24:31:19 **(b)** 4:7:9 **(c)** 63:36:28 **(d)** 16:49:81.

(xiv) which of the following is a row matrix:

(a) $\begin{bmatrix}1 & 2 & 3\end{bmatrix}$ **(b)** $\begin{bmatrix}1 & 2\\ 3 & 4\end{bmatrix}$ **(c)** $\begin{bmatrix}1\\ 2\\ 3\end{bmatrix}$ **(d)** $\begin{bmatrix}1 & 4\\ 2 & 5\\ 3 & 6\end{bmatrix}$

(xv) The 8th term of AP 12, 8,4, 0 ……is

(a) -16 **(b)** -20 **(c)** -12 **(d)** -4.

Question 2

(i) Solve the following quadratic equation

$\frac{X+3}{X+1} - \frac{1-x}{X} = \frac{17}{4}$ Give your answer correct to three significant figures. **[4]**

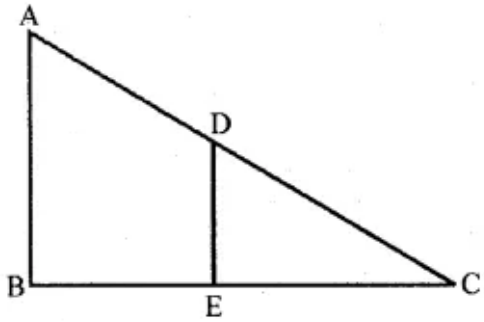
(ii) Rohan has a recurring deposit account in a bank for 2 years at 6% p.a. S.I. , if he gets ₹1200/- as interest at the time of maturity,
find **(a)** His monthly instalment.
(b) The amount of maturity. **[4]**

(iii) In the given figure, AB and DE are perpendicular to BC.

(a) Prove that $\Delta ABC \sim \Delta DEC$

(b) If AB = 6 cm, DE = 4cm and AC = 15 cm, Calculate CD

(**c**) Find the ratio of A (ΔABC) : A (ΔDEC) **[4]**



Question. 3

(i) Use ruler and compass for the following construction.
Draw a circle of radius 4 cm. Mark the center as O. Mark a point P outside the circle at 7 cm from the Centre. Construct two tangents to the circle from the external point P. Measure and write the length of any one tangent. **[4]**

(ii) If A = $\begin{bmatrix} 1 & 0 \\ -1 & 7 \end{bmatrix}$ and I = $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ then determine k so that $A^2 = 8A + kI$. Also find the value of kA + I (where k is a scaler) **[4]**

(iii) Use a graph paper to answer the following questions (take 1 cm= 1 unit on both axis)

(a) Plot A (4,4), B (4, -6) and c (8,0) as the vertices of triangle ABC.

(b) Reflect ABC on the Y- axis and name it as $A^IB^IC^I$.

(c) Write the coordinates of images A^I, B^I, C^I.

(d) Give a geometrical name for $AA^IC^IB^IBC$. **[5]**

SECTION B – (40 MARKS)

(Attempt **any 4** questions from this)

Question 4

(i) Solve the following equation and write the solution set. Also represent it on the real number line. **[3]**

$$-3 + x \leq \frac{8x}{3} + 2 \leq \frac{14}{3} + 2x, \; x \in I$$

(ii) The first term of an A.P is 5 and the last term is 45. If the sum of its terms is 400, determine the number of terms and the common difference. **[3]**

(iii) Prove that: $\frac{\tan A}{1-cotA} + \frac{cot\ A}{1-\tan A} = \sec A.cosec\ A + 1.$ **[4]**

Question 5

(i) Find the value of: $\frac{x+\sqrt{3}}{x-\sqrt{3}} + \frac{x+\sqrt{2}}{x-\sqrt{2}}$; if $x = \frac{2\sqrt{6}}{\sqrt{3}+\sqrt{2}}$ **[3]**

(ii) If x – 2 is a factor of $2x^3 – x^2 – px - 2$

(a) Find the value of P.

(b) With the value of P, factories the above expression completely. **[3]**

(iii) A right circular cylinder with a diameter of 12 cm and height of 15 cm is full of ice cream. The ice cream is to be filled in cones of height 12 cm and diameter 6 cm having a hemispherical shape on the top. Find the number of cones which can be filled with ice cream. **[4]**

Question 6

(i) The marks obtained by 100 students in a physics test are as follows:

Marks	0 - 10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No of students	3	7	12	17	23	14	9	6	5	4

Draw an Ogive for the given distribution on a graph sheet.
and hence find:

(a) Median

(b) Lower quartile

(c) Number of students who obtained more than 85% marks in the test.

(d) Number of students who did not pass the test if the pass percentage was 35. **[6]**

(ii) An airplane at an altitude of 1500 m finds that two ships are sailing towards it in the same direction. The angles of depression are observed from the airplane are 45° and 30° respectively. Find the distance between the two ships. **[4]**

Question 7

(i) Draw a histogram for the given data, using a graph paper Estimate the mode from the graph.

Weekly wages (in ₹)	No of people
3000 – 4000	4
4000 – 5000	9
5000 – 6000	18
6000 – 7000	6
7000 – 8000	7
8000 – 9000	2
9000 – 10000	4

[3]

(ii) A line AB meets the X –axis at A and Y – axis at B. Point P (4, -1) divides AB in the ratio 1: 2.

(a) Find the co-ordinates of A and B.

(b) Find the equation of the line through P and perpendicular to AB. **[3]**

(iii) An article was bought by a distributor for ₹15,000 (excluding tax). He sold it to the trader for ₹ 20,000. The trader sold the article to the retailer for ₹ 22,000 (excluding tax). Find the GST paid by the distributor and by the trader if the tax rate was 10 %. **[4]**

Question 8

(i) Rahul invested ₹ 9,600/- pm ₹ 100 shares at ₹ 20 premium paying 8% dividend. Rahul sold the shares when the price rose to ₹ 160/-. He invested the proceeds (excluding dividend) in 10%. ₹ 50 shares at ₹ 40/-.
Find the:

(a) original number of shares

(b) sale proceeds

(c) new number of shares and change in the two dividends **[3]**

(ii) The hypotenuse of a right-angled triangle is $3\sqrt{5}$. If the smaller side is tripled and the larger side is doubled; the new hypotenuse will be 15 cm. find the length of each side. **[3]**

(iii) Find the mean of the following data **[4]**

Class Interval	50 - 70	70 - 90	90 - 110	110 - 130	130 - 150	150 - 170
Frequency	15	10	20	22	16	17

Question 9

(i) The radius of the internal and external surfaces of a hollow spherical shell is 3cm and 5cm respectively. If it melted and recasted into a solid cylinder of height $\frac{8}{3}$ cm, find the diameter of the cylinder. **[3]**

(ii) A bag, contains 18 balls out of which 'X' balls are red.

a) If one ball is drawn at random from the bag, what is the probability that it is not red?

b) If 2 more red balls are put in the bag, the probability of drawing a red ball will be $\frac{9}{8}$ times the probability of drawing a red ball in the first case. Determine the value of 'X''. **[3]**

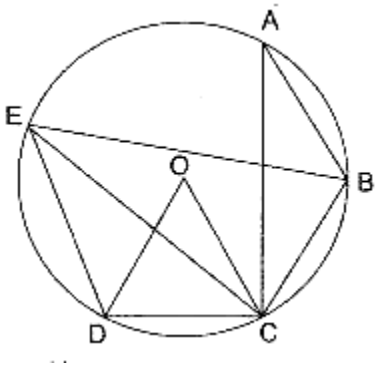
(iii) In the given diagram chords AB, BC and CD are equal. O is the center of the circle. If ∠ABC = 120°,
Find:

(a) ∠BAC

(b) ∠BED

(c) ∠BEC .

(d) ∠COD **[4]**



Question10

(i) The first and last term of geometrical progression are 3 and 96 respectively. If the common ratio is 2
find:

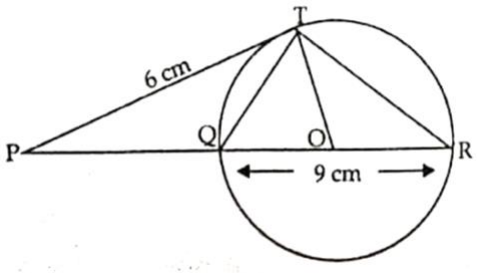
(a) the number of terms 'n' of G.P.

(b) sum of n terms. **[3]**

(ii) In the given figure O is the center of the circle tangent PT meets diameter RQ produced at P.

(a) Prove that Δ PQT ~ Δ PTR

(b) If PT = 6 cm and QR = 9 cm, find PQ **[3]**



(iii) The line segment joining A (2,3) and B (6, -5) is intercepted by the x-axis at point k. Find the ratio in which k divides AB. Also, write the co-ordinates of the point k. **[4]**

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