GREENLAWNS HIGH SCHOOL

DATE: 22-09-2025 **STD. X** **MARKS: 80**

DAY: Monday **MATHEMATICS** **TIME: 2 hours**

[FIGURES TO THE RIGHT INDICATE FULL MARKS]

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

Section-A

Question - 1 **15m**

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

(Do not copy the questions, write the correct answers only.)

i. Find the smallest whole number x such that $3x - 2 < 2(x + 4)$.
   a. 10
   b. 0
   c. 1
   d. 7

ii. Rahul bought an electrical fan which has a marked price of ₹1800. If the GST on it is 18%, then the SGST is
   a. ₹167
   b. ₹162
   c. ₹168
   d. ₹169

iii. The value of k for which the quadratic equation $4x^2 - kx + k = 0$ has equal roots.
   a. 0, 12
   b. 0, 16
   c. 12, 16
   d. 10, 0

iv. If $a, 12, 16$ are in continued proportion then the value of k is
   a. 9
   b. 0
   c. 2
   d. 6

v. If in an AP $t_{16} - t_8 = 56$, then the common difference for this AP is
   a. 8
   b. 4
   c. 7
   d. 3

vi. Which of the following point is invariant with respect to the line $y = -2$
   a. $(3, 2)$
   b. $(3, -2)$
   c. $(2, 3)$
   d. $(-2, 3)$

vii. The 2nd term of a GP is 4 and the 4th term is 64, then its common ratio is equal to.

a. 1
b. 5
c. 3
d. 4

viii. If $f(x) = x^{36} + x^{37}$ is divided by $x + 1$, then the remainder will be
a. 3
b. 0
c. 2
d. 1

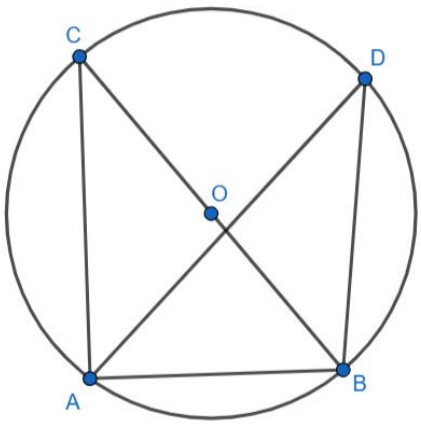
xi. Assertion (A): every square matrix is a diagonal matrix.
Reason (B): A diagonal matrix is a square matrix in which all the non-diagonal elements are zero
a. Both A and R are true, and R is the correct explanation of A.
b. Both A and R are true, but R is not the correct explanation of A.
c. A is false, but R is true.
d. A is true, nut R is false.

x. The slope of the line perpendicular to $4x + 4y = 11$ is
a. $-\frac{4}{7}$
b. $\frac{7}{4}$
c. $\frac{4}{7}$
d. $\frac{4}{11}$

xi. If ₹800 is deposited every month in an RD account for 8 months at 20% rate of interest, then the qualifying sum will be.
a. ₹28,800
b. ₹29.800
c. ₹27,900
d. ₹20,000

xii. If $P(x) = \frac{1}{2}$ is the probability of winning a game then $P(y)$, the probability of losing the game is.
a. $\frac{1}{2}$
b. $\frac{1}{4}$
c. $-\frac{1}{2}$
d. $-\frac{1}{4}$

xiii. In the given figure, if O is the center of the circle, then the value of x is
a. 5
b. 9
c. 10
d. 4



xiv. The center of the circle having end points of its diameter as (-3,0) and (1,2) is
   a. $(1, 0)$
   b. $(0, 1)$
   c. $(1, -1)$
   d. $(-1, 1)$

xv. If the mean of 8 observations is 41, if each observation is increased by 9, then the new mean will be.
   a. 41
   b. 43
   c. 45
   d. 50

Question - 2

i. Given $A = \begin{bmatrix} 2 & 0 \\ -3 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 0 & 1 \\ -2 & 3 \end{bmatrix}$ Calculate $A^2 - 2AB$ **4m**

ii. Mrs. Naik opened a recurring deposit account in a bank, she deposited ₹2000 per month for 15 months. At the same time of maturity, she received ₹32000, find **4m**
   a) The total interest earned by Mrs. Naik
   b) The rate of interest per annum,

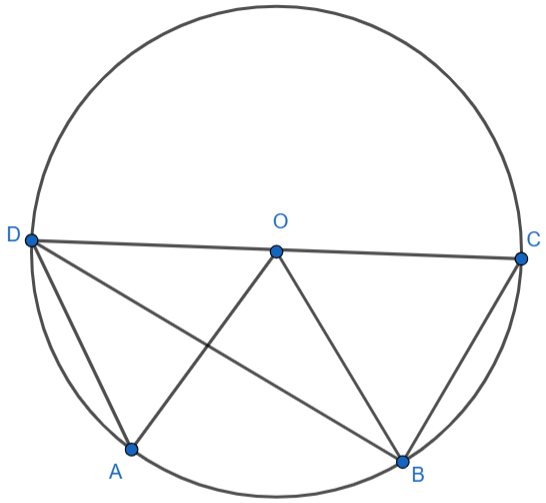
iii. The mean of the following distribution is $32\frac{1}{2}$, find f_1 and f_2 if the sum of frequencies is 100 **4m**

C.I	0-10	10-20	20-30	30-40	40-50	50-60
f	5	10	f_1	35	f_2	10

Question – 3

i. Each of the letters of the word 'TRANSFORMED' is written on identical circular disc and placed in a bag, one disc is drawn at random. What is the probability that the letter drawn is **4m**
   a) A vowel
   b) One of the first 7 letters of the English alphabet
   c) A consonant that occurs more than once,

ii. In the given figure, O is the center of the circle and, $\angle AOB = 72°$, and $arc\ AB = 2\ arc\ BC$, find **4m**
   a) $\angle BOC$
   b) $\angle DCB$
   c) $\angle ADB$
   d) $\angle BDC$



iii. Use graph paper for this question taking $2\ cm = 2\ units$ on both the axis **5m**
   a) Plot $A\ (2, 6)$ and $E\ (5, 2)$

b) Reflect A in the x-axis, y-axis and origin and name their images as B, C and D respectively.
c) Reflect B in x-axis, y-axis and origin and name their images as F, G and H respectively.
d) Join all the points A, E, F, B, H, D, G, C in order and write the geometrical name of the closed figure.
e) Write any one point on the closed geometrical figure that is invariant in the y-axis.

SECTION - B

Question - 4

i. For the following inequation, graph the solution set on the real number line **3m**

$$-\frac{1}{3} \leq \frac{x}{2} + 1\frac{2}{3} < 5\frac{1}{3}, x \in R$$

ii. If $x + 1$ is a factor of the polynomial $f(x) = 3x^3 + 8x^3 + kx - 2$, find the value of k and hence factorize the polynomial completely. **3m**

iii. Point P lies on the line segment joining $A\ (2, -3)$ and $B\ (6,1)$. Another line is perpendicular to AB, which passes through point P and intersects the y-axis at point Q, if point P divides AB in the ratio 1:3 find **4m**

a) Coordinate of point P
b) Slope of the line perpendicular to AB
c) Equation of the line perpendicular to AB and passing through P
d) Coordinates of point Q

Question - 5

i. Fine the mode of the following data using histogram. **3m**

CI	40-50	50-60	60-70	70-80	80-90	90-100	100-110
f	5	8	14	28	14	9	3

ii. Solve the following quadratic equation **3m**

$$x^2 - 7x + 5 = 0$$

Give your answer correct to 2 significant figures.

iii. Ravi covered a road trip of 240 km. He drove the first half of the distance at a speed that is 20 km/h less than the speed for the second half. If the total time taken to cover the entire distance was 5 hours find **4m**

a) The speed at which Ravi drove the second half.
b) The time taken to cover the first half of the journey.

Question - 6

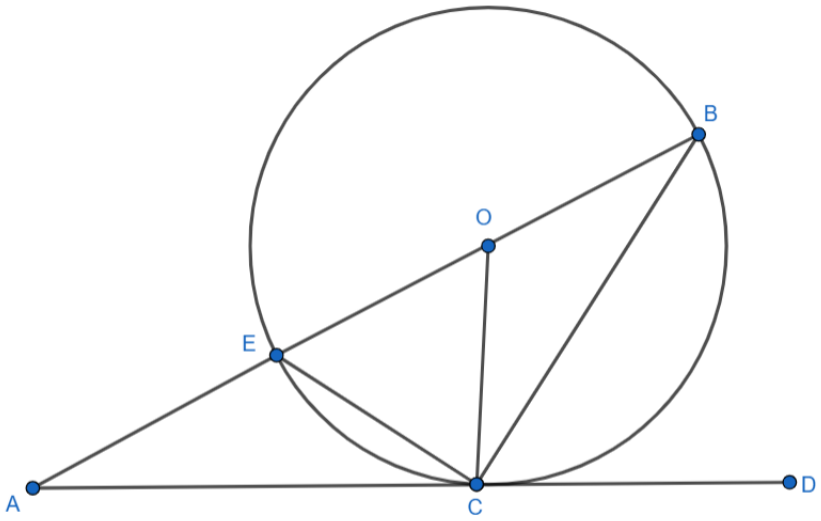
i. Using properties of proportions, solve for x **3m**

$$\frac{\sqrt{x+3} + \sqrt{x-12}}{\sqrt{x+3} + \sqrt{x-12}} = \frac{5}{3}$$

ii. In a GP, the first term is 5 and the common ratio is 2. The sum of the first n terms is 2555 find **3m**

a) Value of n.
b) n^{th} term of the progression.

iii. In the given figure, AD touches the circle with centre O at C, diameter EB, when produced meets AD at A, if $\angle ECA = 30°$, **4m**



Find

a) $\angle EBC$
b) $\angle COB$
c) $\angle BAC$
d) $\angle OCE$

Question - 7

i. The following table shoes monthly mobile data usage (in GB) of 40 users of a telecom company **5m**

Monthly data usage (in GB)	2-4	4-6	6-8	8-10	10-12
No. of users	4	9	11	10	6

a) Draw an ogive for the above data
b) Find the median monthly data usage
c) Find the upper quartile of the data usage
d) Find out how many users consume more than 9 GB of data monthly.

ii. Find four numbers in AP, whose sum is 40 and the sum of whose squares is 480. **5m**

Question - 8

i. Construct triangle ABC, in which $AB = 6.5\,cm$, $AC = 5.5\,cm$ and $\angle BAC = 60°$. Construct the circumscribing circle of triangle ABC and mention the radius **3m**

ii. When $f(x) = ax^3 + bx - 4x + 6$is divided by $x + 1$ it leaves the same remainder as when divided by $x - 1$. If the sum of both remainder is 6, find the values of a and b **3m**

iii. Refer to the bill shown below. A customer paid ₹1640 to clear the bill **4m**

Note: A 15% discount is applicable on an article if the total cost (before discount and GST) exceeds ₹1000

Articles	**Price**	**Quantity**	**GST**
Pen Set	₹250	5	12%
Desk lamp	₹320	2	18%

Check whether the customer has paid the correct amount, if not calculate the difference between the actual bill and the amount paid.