GREENLAWNS HIGH SCHOOL
TERMINAL EXAMINATION YEAR 2019
SUBJECT : MATHEMATICS   **CLASS : X**
TIME   : 2 ½ HOURS   **MARKS: 80**

You will not be allowed to write during the first 10 minutes. This time is to be used in reading the question paper. Attempt all questions from section A and any four questions from Section B.

All working including rough work must be done on the same sheet as the rest of the answer.

Section A (40 Marks)
(Attempt all questions from this section)

I

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

$$-2\frac{1}{6} \le \frac{x}{3} - 1\frac{1}{6} < \frac{5}{6}, x \in N$$

b. Find matrix Z if (3)

$$\begin{bmatrix} 3 & 2 \\ 5 & -4 \end{bmatrix} + Z = \begin{bmatrix} 8 & -2 \\ 7 & 9 \end{bmatrix} - \begin{bmatrix} 6 & -3 \\ 3 & 8 \end{bmatrix}$$

c. The line $3y = 4x + 18$ intersects the Y- axis at A. Find (i) co-ordinates of A (4)
(ii) Equation of the line through A and parallel to the line $3x + 2y = 6$

II

a. A person deposits a certain sum of money every month in a recurring deposit (3) Account for 2 years. If he receives Rs.71,550 on maturity at 10% p.a. Calculate the monthly installment.

b. Prove that $\dfrac{\cot^2 A}{(\text{cosec } A + 1)^2} = \dfrac{1 - \sin A}{1 + \sin A}$ (3)

c. Find 'a' if the mean of the following distribution is 33.68 (4)

C.I.	10 – 18	18 – 26	26 – 34	34 – 42	42 – 50
f	4	7	a	18	10

III

a. Using the properties of proportion solve for x (3)
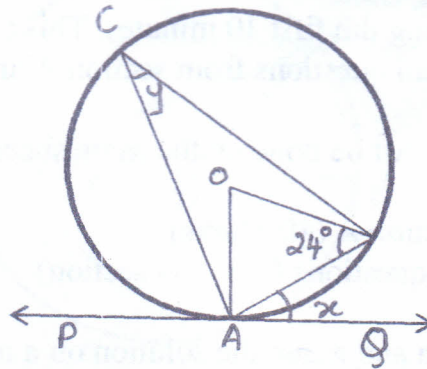
$$\frac{x^3 + 12x}{6x^2 + 8} = \frac{682}{182}$$

b. Find the value of 'p' if the roots of the following equation are real and equal. (3)
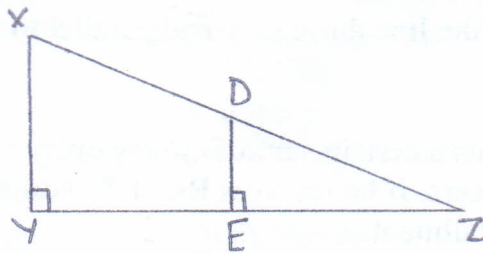
$$(p+1)x^2 - 2(3p+1)x + 8p + 1 = 0$$

c. Using factor theorem show that $(x - 1)$ is a factor of $x^3 - 7x^2 + 14x - 8$. (4)
Hence mention all the factors of the given expression.

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IV

a. In the figure drawn below, O is the centre of the circle. Find x and y if (3)
PQ is a tangent to the circle at A.

b. In the figure drawn below XY and DE are perpendiculars to YZ. If (3)
XY = 12 cm, DE = 8 cm, XZ = 4x + 2 and DZ = 3x − 1, find XD
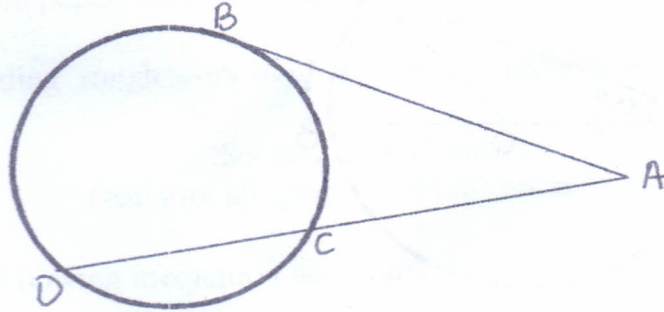

c. Construct a regular hexagon whose each side measures 4.5 cm. Construct (4)
A circle touching the vertices of the hexagon and record its radius.

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Section B
(Any 4 out of 5)

V

a. In the figure drawn below AB is a tangent to the circle at B. If AB = 24 cm, (3) CD = 20 cm find AC

b. A right circular cone is 10.8 cm high and the radius of the base is 1.6 cm. It is melted and recast into a cylinder which has a base with radius 1.2 cm. Find the height of the cylinder. (3)

c. The marks of 100 students in a particular test is given below. Draw a histogram for the given distribution and locate its mode. (4)

| Marks	20 – 29	30 – 39	40 – 49	50 – 59	60 – 69
No. of students	18	23	32	16	11

VI

a. Evaluate $\begin{bmatrix} 4\cos 60° & 2\sin 30° \\ \sin 90° & 2\cos 0° \end{bmatrix} \begin{bmatrix} 1 & -2 \\ 3 & 1 \end{bmatrix}$ (3)

b. Find the ratio in which the line segment joining P(2, - 5) and Q(-3, 10) is (3) divided by the Y-axis. Also find the point of intersection.

c. A model of a ship is made to a scale of 1:3000 (4)

(i) If the length of the model is 40 cm, find the length of the ship in m.

(ii) If the area of the deck of the ship is 36 km^2 find the area of the deck of the model in m^2.

(iii) If the volume of the model is 1.6m^3 find the volume of the ship.

VII

a. Riya bought a certain number of books for Rs.360. When the price of each (3) Book was reduced by Rs.3, she could buy 6 more books for the same cost of Rs.360. Find the original cost of the book.

....4/-

b. A sphere of radius 12 cm is melted to form smaller cones of radius 8 cm and height 4 cm. Calculate the number of cones formed. (3)

c. In the figure drawn below O is the centre of the circle. ABCD is a cyclic (4) quadrilateral, AB//CD and $\angle CAB = 35°$. Find $\angle COB, \angle ADC, \angle DAC$ and $\angle DCB$
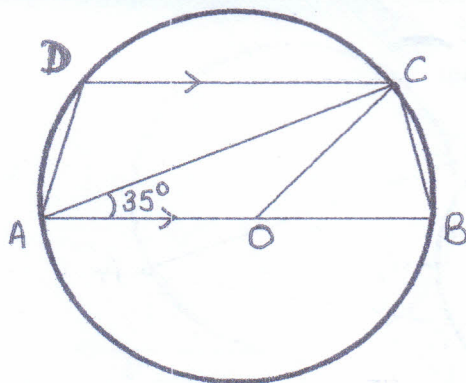
VIII

a. Solve the following quadratic equation and express your answer correct to (3) 2 significant figures.

$$5x^2 + 10x - 3 = 0$$

b. If $(x - 8)$, $(x + 4)$ and $(x + 28)$ are in continued proportion, then find the (3) numbers.

c. Plot A(2, 3), B(5, 0) and C(2, - 3) on a graph paper. (4)
   (i) Reflect A, B & C in Y-axis to get A', B', C' write their co-ordinates.
   (ii) Name the figure ABCC'B'A'
   (iii) Name any one invariant point on the figure.

IX

a. The marks obtained by some students in a particular test are given below (6)

Marks	0 – 10	10 – 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80	80-90	90-100
No. of students	4	10	16	21	27	19	10	6	4	3

Draw an ogive for the above distribution, use your ogive to estimate
1) Median   2) Upper Quartile   3) Number of students who scored above 65 marks   4) Number of students who scored less than 30 marks.

b. From the top of a building 18 m high the angle of elevation of the top of another building on the opposite side of the street is 30, and the angle of depression of the foot of the same building is 60 Find (4)
1) The height of the other building
2) Distance between the two buildings

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