MATHEMATICS

Maximum Marks: 20

Time allowed: 30 minutes

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

*You will **not** be allowed to write during first **5** 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

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*Attempt **all** questions from **Section A** and **any two** 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 papers are provided

SECTION A (10 marks)

*(Attempt **all** questions from this **Section**)*

Question 1

Choose the correct answers to the questions from the given options. [4]
(Do not copy the questions, write the correct answers only.)

(i) If $\begin{bmatrix} 2 & 0 \\ 0 & 4 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 2 \\ -8 \end{bmatrix}$, the value of x and y respectively are:

(a) 1, -2

(b) –2, 1

(c) 1, 2

(d) –2, –1

(ii) If 3 is a root of the quadratic equation $x^2 - px + 3 = 0$, then p is equal to:

(a) 4

(b) 3

(c) 5

(d) 2

(iii) Which of the following cannot be determined graphically for a grouped frequency distribution?

(a) Median

(b) Mode

(c) Quartiles

(d) Mean

(iv) The roots of $100x^2$–$20x + 1 = 0$ is:

(a) 1/20 and 1/20

(b) 1/10 and 1/20

(c) 1/10 and 1/10

(d) None of the above

Question 2

Solve the following quadratic equation:

$$x^2 + 4x - 8 = 0$$

Give your answer correct to one decimal place. [3]

Question 3

If $A = \begin{bmatrix} 1 & 3 \\ 2 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 2 \\ 2 & 4 \end{bmatrix}$, and $C = \begin{bmatrix} 4 & 1 \\ 1 & 5 \end{bmatrix}$, and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, Find $A(B + C) - 14I$ [3]

SECTION B (10 marks)

*(Attempt **any two** questions from this **Section**)*

Question 1 [5]

The following distribution gives the daily wages of 60 workers of a factory.

Daily income in	Number of workers (f)
200 – 300	6
300 – 400	10
400 – 500	14
500 – 600	16
600 – 700	10
700 – 800	4

Use graph paper to answer this question. Take 2 cm = 100 along one axis and 2 cm = 2 workers along the other axis. Draw a histogram and hence find the mode of the given distribution.

Question 2 [5]

Given $\begin{bmatrix} 4 & 2 \\ -1 & 1 \end{bmatrix} M = 6I$, where M is a matrix and I is unit matrix of order 2x2. Find:

- Order of matrix M
- Find the matrix M

Question 3 [5]

$$\frac{4}{x+2} - \frac{1}{x+3} = \frac{4}{2x+1}$$