SECOND SERIES EXAMINATION - MARCH 2021

FIRST SEMESTER (MCA)

Course Code : 20MCA101

Course Name: Mathematical Foundation for Computing

Max.Marks: 50 Time: Two hours

| Question no | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO Mapped | 4 | 2 | 2 | 2 | 3 | 4 | 2 | 2 | 4 | 2 | 2 | 2 | 2 |
| Maximum Marks | 4 | 4 | 4 | 4 | 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |

## PART A

Answer All Questions. Each Question carries 4 marks

1. Find the nature, rank, index of the quadratic form $6x_1^2 + 3x_2^2 + 3x_3^2 - 4x_1x_2 + 4x_1x_3 - 2x_2x_3$.

2. Solve $a_n - 6a_{n-1} + 8a_{n-2} = 0$

3. Find the GCD (12378, 3054 ).

4. If c divides ab and gcd (a,c) = 1 then prove that c divides b.

5. Define (i) Simple graph (ii) Pseudo graph (iii) Multigraph.

## PART B

Answer any five question. Each Question carries 6 marks .

6. Find out what type of conic sections the quadratic form $Q = 17x_1^2 - 30x_1x_2 + 17x_2^2 = 128$ represents and transform it into principal axis form.

7. Solve for the integers x and y such that $71x - 50y = 1$.

8. Solve $a_{n+2} - 4a_{n+1} + 3a_n = -200$, given that $a_0 = 3000$, $a_1 = 3300$.

9. Diagonalize the matrix $\begin{bmatrix} -1 & 2 & -2 \\ 2 & 4 & 1 \\ 2 & 1 & 2 \end{bmatrix}$.