

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

M.A./M.Sc. SECOND SEMESTER EXAMINATION, MAY 2024

FIRST YEAR [BATCH 2023-25]

MATHEMATICS

PAPER : CC 10

Date : 29/05/2024

Time : 11.00 am – 12:30 pm

Full Marks : 30

Answer all questions, Maximum one can score is 30.

[All the notations have their usual meaning.]

1. In Graeffe's root squaring method for a cubic equation how you will conclude that all roots are real and have equal magnitude? How will you find the roots in this method? [5+5]
2. Show that Gauss Siedel method converges when the coefficient matrix is row diagonally dominated. [6]
3. Discuss Cubic-spline method. [5]
4. Discuss why Newton Raphson method (for simple root) will converge when the initial point is very close to the root. [5]
5. Discuss Rutishauser method for finding eigen values of a matrix. Find all eigen values of the matrix (using Rutishauser method) $\begin{bmatrix} 4 & 3 \\ 1 & 2 \end{bmatrix}$. [5+5]

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