

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2026

B.Tech.-IV Semester (M&C)

COURSE CODE (CREDITS): 25BS1MA411 (3)

MAX. MARKS: 15

COURSE NAME: NUMERICAL ANALYSIS FOR MATHEMATICAL COMPUTING

COURSE INSTRUCTOR: SST

MAX. TIME: 1 Hour

*Note: (a) All questions are compulsory.*

*(b) The candidate is allowed to make suitable numeric assumptions wherever required for solving problems.*

*(c) Use of a scientific calculator is allowed.*

Q. No.	Question	CO	Marks
Q1	Three approximate values of the number $\frac{1}{7}$ are given as 0.141857, 0.142857, and 0.143857. Which of these values is the best approximation and why?	1	3
Q2	a) Find a real root of the equation $x^3 - 9x + 1 = 0$ using the iterative method up to three decimal places. b) What is the order of convergence of the iterative method?	2	3
Q3	Use the method of false position to find a real root of the transcendental equation $\cos x = xe^x$ up to three decimal places.	2	3
Q4	a) Mention the primary difference between the evaluation process of the Gauss-Jacobi method and the Gauss-Seidel method by considering the following system of linear equations: $10x + y + 2z = 19$ $3x + 15y - z = -34$ $2x - 3y + 17z = 23$ b) Which method is more robust and why?	3	3
Q5	Obtain the largest eigenvalue of the following matrix using Rayleigh's power method: $\begin{bmatrix} 2 & 1 & 1 \\ 1 & 2 & 1 \\ 0 & 0 & 1 \end{bmatrix}$ , by performing three iterations only.	3	3

180