

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS- 2026

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

COURSE CODE (CREDITS): 25BS1MA411 (3)

MAX MARKS: 35

COURSE NAME: NUMERICAL ANALYSIS FOR MATHEMATICAL COMPUTING

COURSE INSTRUCTOR: SST

MAX. TIME: 2 Hours

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	Use the secant method to determine the root, between 5 and 8, of the equation $x^{2.2} = 69$.	2	5												
Q2	Using Newton divided difference formula to find $f(x)$ as a polynomial in x for the following table: <table><tr><td>x</td><td>-1</td><td>0</td><td>3</td><td>6</td><td>7</td></tr><tr><td>$f(x)$</td><td>3</td><td>-6</td><td>39</td><td>822</td><td>1611</td></tr></table>	x	-1	0	3	6	7	$f(x)$	3	-6	39	822	1611	4	5
x	-1	0	3	6	7										
$f(x)$	3	-6	39	822	1611										
Q3	Evaluate the following integral using trapezoidal rule with ten ordinates. $\int_{-2}^2 \frac{x}{5+2x} dx$	5	5												
Q4	Using Simpson's $\frac{1}{3}$ rule with $h = 1$, evaluate the integral: $\int_3^7 x^2 \log x dx$	5	5												
Q5	Determine the value of y when $x = 0.2$, given that $y(0) = 1$ and $y' = x^2 + y$, using modified Euler's method.	6	5												
Q6	Solve the initial value problem, $\frac{dy}{dx} = 3x + \frac{y}{2}$ with the condition $y(0) = 1$ to obtain $y(0.2)$, using Runge-Kutta fourth order method.	6	5												
Q7	Find the singular value decomposition of the matrix: $\begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$	3	5												