Name: Enrolment No:	MANIPAL UNIVERSITY JAIPUR

Odd Semester Mid Term Examination, Dec 2024
Faculty of Engineering
Department of Mathematics & Statistics
B.Tech, Ist Year

Course Code: MAS1002	**Course: Computational Mathematics**	**Semester: I**
Time: 1.5 hrs.		**Max. Marks: 30**

Instructions: **All questions are compulsory.**
Missing data, if any, may be assumed suitably.
Calculator is allowed.

S.No.	**SECTION A (Memory Based Questions)**	**Marks**	**CO**
Q A1	Find $E^{-2}f(x+h)$ a. $f(x+2h)$ b. $f(x-2h)$ c. $f(x+h)$ d. $f(x-h)$	2	**CO1**
Q A2	Which of the following sentence is correct? a. Newton's backward interpolation formula is useful for interpolation near to middle values b. Newton's backward interpolation formula is useful for interpolation near to starting of the tabular values c. Newton's backward interpolation formula is useful for interpolation near to end of the tabular values d. Newton's backward interpolation formula is useful for interpolation when given interval is unequal	2	**CO1**
Q A3	What is a simple graph? a. A graph without any loops or multiple edges b. A graph with only one vertex c. A graph with no edges d. A graph with no vertices	2	**CO4**
	SECTION B (Concept Based Questions)		
Q B1	Use Stirling formula to find y_{28}, from the following data: x: 20, 25, 30, 35, 40 y: 49225, 48316, 47236, 45926, 44306	4	**CO1**
Q B2	Find the value of $\int_0^1 \frac{x^2}{1+x^3}\,dx$, by using Simpson's 1/3 Rule. ($h = 0.25$)	4	**CO2**
Q B3	Find a real root of the equation $x^3 - 2x - 5 = 0$, by Regula Falsi Method, taking initial roots as 2 & 3, up to fourth iteration.	4	**CO2**
Q B4	Find the number of vertices in a graph with 20 edges, if each vertex is of degree 4. Explain your answer properly.	4	**CO4**
	SECTION-C (Analytical Based Questions)		
Q C1	Apply the fourth order Runge-Kutta method to find $y(0.2)$ for the differential equation $\frac{dy}{dx} = -y$, given $y(0) = 1, h = 0.1$.	8	**CO3**