BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION MO2024)

CLASS: BTECH **SEMESTER : III/ADD**
BRANCH: BT/CHEM/ME/PIE/CE/FT **SESSION : MO/24**

SUBJECT: MA203 NUMERICAL METHODS

TIME: 02 Hours **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1	Find a real root of the equation $x^2 - 2x - 5 = 0$, up to three decimal digits, using Newton's method with initial guess $x_0 = 2$.	[5]		
Q.2	Define the method of Secant and use this method to find a root of the equation $xe^x - 1 = 0$.	[5]		
Q.3	Using the Gauss elimination method, find the solution of the system of equations: $x + y + z = 6$; $3x + 3y + 3z = 20$; $2x + y + 3z = 13$	[5]		
Q.4	Perform three iterations of the *Gauss-Seidel method* to solve the system equations: $-\mathbf{2}x - y = 7$; $-x + \mathbf{2}y - z = \mathbf{1}$; $-y + \mathbf{2}z = \mathbf{1}$; with initial guess $\boldsymbol{x_0} = (\mathbf{0}, \mathbf{0}, \mathbf{0})$.	[5]		
Q.5	Compute interpolating polynomial by using Lagrange interpolation formula. Also compute $f(2.8)$ from the following table:	[5]		

x	0	1	2	3
f(x)	1	2	11	34

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