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

CLASS: BTECH
BRANCH: ECE/EEE/CSE/IT

SEMESTER: IV
SESSION : SP/2020

SUBJECT: MA203 NUMERICAL METHODS

TIME: 2 HOURS

FULL MARKS: 25

INSTRUCTIONS:
1. The total marks of the questions are 25.
2. Candidates may attempt for all 25 marks.
3. Before attempting the question paper, be sure that you have got the correct question paper.
4. The missing data, if any, may be assumed suitably.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

				CO	BL	PO
Q1	(a)	Distinguish between algebraic and transcendental equations. Is the equation $x - \pi = 0$ algebraic or transcendental? Justify your answer.	[2]	1	1.11	1,3
Q1	(b)	Use Newton-Raphson method to solve $\sin x - x/2 = 0$ (show 3 iterations)	[3]	1	1.20	2,3
Q2	(a)	Explain secant method.	[2]	1	1.25	1,3
Q2	(b)	Solve $4e^{x}\sin x - 1 = 0$ by regula falsi method (show 3 iterations)	[3]	1	1.20	2,3
Q3	(a)	Explain how you will decide whether to use a direct or an indirect method for solving a system of simultaneous linear equations. Name one direct and one indirect method in the context.	[2]	2	1.25	1,3
Q3	(b)	Solve by Gauss Jordan method the following equations: $2x - 3y + 10z = 3$; $-x + 4y + 2z = 20$; $5x + 2y + z = -12$	[3]	2	1.20	2,3
Q4	(a)	Explain how you can use power method for finding the maximum eigenvalue.	[2]	2	1.25	1,3
Q4	(b)	Solve by Gauss Seidel method (show 3 iterations) the following equations: $27x + 6y - z = 85$; $6x + 15y + 2z = 72$; $x + y + 54z = 110$	[3]	2	1.20	2,3
Q5	(a)	Define interpolation. What are its fundamental assumptions?	[2]	3	1.25	1,3
Q5	(b)	Given $u_0 = 580$, $u_1 = 556$, $u_2 = 520$ and $u_4 = 385$, find u_3.	[3]	3	1.20	2,3

::::::26/02/2020::::::E