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

CLASS: B.TECH
BRANCH: PROD/MECH/CHEM.ENGG./CEP&PE/BT/CIVIL

SEMESTER: III
SESSION : MO/2019

SUBJECT : MA203 NUMERICAL METHODS

TIME: 2:00 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.

Q1 Define general error formula. Compute the relative error in the time period $T=2\pi\sqrt{\frac{l}{g}}$ for $l=1$ if the error in the measurement of l is 0.01. [5]

Q2 Discuss the convergence in Newton Raphson method. [5]

Q3 Solve by Gauss elimination method the following simultaneous equations: [5]
$3x-2y+2z=12$; $x+2y+3z=11$; $2x-2y-z=3$

Q4 Prove that. [5]
i. $\Delta.\nabla=\Delta-\nabla$ ii. $\nabla E=\Delta$

Q5 Using Newton's forward interpolation, find a cubic polynomial f(x) that takes the following data, and hence calculate f(0.5). [5]

x	0	1	2	3
f(x)	1	0	1	10

::::::: 19/09/2019 :::::::E