

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION MO/2023)

CLASS: BCA
BRANCH: BCA

SEMESTER: III
SESSION: MO/2023

TIME: 02 Hours

SUBJECT: CA209 COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS
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
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- Q.1(a) Round off the following numbers correct up to five significant figures: [2] CO B BL L-1
(i) 5.1239612 (ii) 74.24550
- Q.1(b) Define relative error. Truncate the following number after 3 decimal places to get [1+2] B L-2,3
an approximate value and then calculate the relative error present in the
approximate value:
34.276582
- Q.2(a) Arrange the following three methods of solving an equation in ascending order of [2] B L-3
their convergence rate:
(i) Regula-Falsi method
(ii) Bisection method
(iii) Newton-Raphson method
- Q.2(b) Solve the following equation by Newton-Raphson method correct upto 2 decimal [3] A L-2
places:
 $x^3 - 2x^2 - 1 = 0$
- Q.3(a) Prove that $\Delta(cf(x)) = c \Delta f(x)$ [2] A L-2
Q.3(b) Find $\Delta^3(4x^3 + 2x + 3)$, assuming increment of x to be 1. [3] A L-2
- Q.4(a) Name a method of interpolation which is used for non-equispaced arguments. Write [1+1] C L-3
the corresponding formula.
- Q.4(b) Use Newton's forward interpolation formula to compute f(3) using the following [3] L-3
table.

x	2	4	6	8	10
f(x)	8	13	22	34	50

- Q.5(a) When a system of equation is said to be inconsistent? [2] A L-2
Q.5(b) Solve the following system of equations by *Gauss Elimination* method: [3] D L-3
 $x + 2y + z = 0$
 $2x + 2y + 3z = 3$
 $-x - 3y = 2$