JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2023

B.Tech-I Semester (CE)

COURSE CODE (CREDITS): 18B11MA311 (3) MAX. MARKS: 15

COURSE NAME: NUMERICAL METHODS

COURSE INSTRUCTORS: Dr. P K Pandey MAX. TIME: 1 Hour

Note: *(a) All questions are compulsory.*

(b)Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make suitable numeric assumptions wherever required for solving problems.

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1. The actual length of a bridge is 500 feet. A measuring instrument shows the length to be 508 feet. Compute the absolute error, relative error, and percentage error in the measured length. [2M] [CO1]

2. Use bisection method to obtain a root of the equation $x^3 - 3x - 5 = 0$. Take initial approximation $x_0 = 2.5$. [3M] [CO1]

3. Obtain a positive root of $f(x) = 2x^3 - 3x - 6 = 0$ by Newton-Raphson method. Take initial approximation $x_0 = 2$. Write your answer correct to five decimal places, and up to 4^{th} iteration. [3M] [CO1]

4. Use fixed point iteration method (up to 4^{th} iteration) to find a root of $x^3 - 2x - 5 = 0$. You may take $x_0 = 2$. [3M] [CO1]

5. Solve the following system of equations by Gauss Jordan method: [4M] [CO2]

$$2x + 3y + 4z = 20,\ x + 2y + z = 8,\ 4x + 3y + 2z = 16$$

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