Department of Computer Science

Mid Term Examination

Class/Section: BSCS 6(A,B)

(SPRING 2023 Semester)

Paper Type: Descriptive

Course: NUMERICAL ANALYSIS		Date: 13/4/23
Course Code: GSC-320		Session : II
Faculty's Name: Ambrina Kanwal		Max Marks: 20
Time Allowed: 90 minutes		Total Pages: 1

INSTRUCTIONS:

I. All questions are compulsory.
II. There are total Four questions.
III. All submissions must contain student information including: Student's Name, Enrollment number, Degree program Title, Semester and Section.
IV. Copied/Plagiarized submissions will not be marked and action against student will be taken as per Exam policy

Student's Name: _____ Enroll No: _____
(USE CAPITAL LETTERS)

Question # 1 (5 Marks) (PLO – 1)

Solve the linear system by Jacob's method and construct the table for all entries/solutions. Apply five iterations only.

$$10\,x_1 - x_2 = 9,$$
$$-x_1 + 10\,x_2 - 2\,x_3 = 7,$$
$$-2\,x_2 + 10\,x_3 = 6.$$

Question # 2 (5 Marks) (PLO – 1)

Use Newton's method to find solution for the following problem (Apply five iterations only)

$$x^3 - 2x^2 - 5 = 0, \quad [1, 4]$$

(Construct the table for all entries/solutions)

Question # 3 (5 Marks) (PLO – 1)

Use the Bisection method to find the solution accurate to within 10^{-2}

for $f(x) = \sqrt{x} - \cos x$ on $[0, 1]$

(Construct the table for all entries/ solutions)

Question # 4 (5 Marks) (PLO – 2)

For the given functions f (x) = tan x (use radian measures)

let $x0 = 0$, $x1 = 0.6$, and $x2 = 0.9$, compute f(x) taking 6 dp and Construct the table and label all entries.

Compute interpolation polynomial P(x) of degree two using Lagrang's interpolation formula to approximate the value of P (0.45) and compare your result with the actual solution f(0.45).

End of the Question Paper