



Program: BS (CS)
Semester: Spring-2020
Course: MT207-Numerical Methods

Examination: Assignment # 01
Total Marks: 10, Weightage: **2.5**
Date of Submission: 05 / 03 / 2020

Note: Attempt all questions

Problem 1

The fourth-degree polynomial

$$f(x) = 230x^4 + 18x^3 + 9x^2 - 221x - 9$$

has two real zeros, one in $[-1, 0]$ and the other in $[0, 1]$. Attempt to approximate these zeros to within 10^{-6} using the

- a. Method of False Position
- b. Secant method
- c. Newton's method

Use the endpoints of each interval as the initial approximations in (a) and (b) and the midpoints as the initial approximation in (c).

Problem 2

Let $f(x) = -x^3 - \cos x$ and $p_0 = -1$. Use Newton's method to find p_2 . Could $p_0 = 0$ be used?

Problem 3

Use Newton's method to solve the equation

$$0 = \frac{1}{2} + \frac{1}{4}x^2 - x \sin x - \frac{1}{2} \cos 2x, \quad \text{with } p_0 = \frac{\pi}{2}.$$

Iterate using Newton's method until an accuracy of 10^{-2} is obtained.

Problem 4

Find an approximation to $\sqrt{3}$ correct to within 10^{-4} using the Bisection Algorithm.

(Hint: Let $x = \sqrt{3} \Rightarrow x^2 = 3 \Rightarrow x^2 - 3 = 0$).

The End