

Assignment 04

Third Year B.S. (Honors) 2019-2020

Course Title: Math Lab III Course Code: AMTH 350

Department of Applied Mathematics, University of
Dhaka

Name: Roll No: Group:

Write a MATLAB Script-M file to solve each of the following problems.

No	Problem
1.	Use the Bisection method to find an approximation with accuracy 10^{-5} , to a value in $[0.5, 1.5]$ for $\diamond\diamond(\diamond\diamond) = e^x - 2 - \cos(e^x - 2)$. Show your answer in a table with headings as follows: "Iteration No.", "a", "b", " $\diamond\diamond$ ", " $ \diamond\diamond(\diamond\diamond) $ "
2.	Express the following equation as a fixed-point problem $\diamond\diamond = \diamond\diamond(\diamond\diamond)$ in three different ways $x^3 - x + e^x = 0$ Use Fixed Point Iteration Method to find an approximation with accuracy 10^{-5} . Show your answers in a table with suitable headings. Comment on the convergence of choices of $\diamond\diamond(\diamond\diamond)$.
3.	Set $\diamond\diamond(\diamond\diamond) = 54\diamond\diamond^6 + 45\diamond\diamond^5 - 102\diamond\diamond^4 - 69\diamond\diamond^3 + 35\diamond\diamond^2 + 16\diamond\diamond - 4$. Plot the function on the interval $[-2, 2]$, and use the Secant Method to find all five roots in the interval. Show your results in a table with headings as follows: "Iteration No.", " $\diamond\diamond_{\diamond\diamond}$ ", " $\diamond\diamond\diamond\diamond\diamond\diamond\diamond\diamond\diamond\diamond\diamond\diamond\diamond\diamond\diamond\diamond$ ".
4.	Apply Newton's Method to find both roots of the function $\diamond\diamond(\diamond\diamond) = 14\diamond\diamond\diamond\diamond\diamond\diamond^{\diamond\diamond-2} - 12\diamond\diamond\diamond\diamond^{\diamond\diamond-2} - 7\diamond\diamond^3 + 20\diamond\diamond^2 - 26\diamond\diamond + 12$ on the interval $[0, 3]$. Print out the sequence of iterations, the errors $\diamond\diamond_{\diamond\diamond}$, and the relevant error ratio $\diamond\diamond_{\diamond\diamond+1}/\diamond\diamond_{\diamond\diamond}^2$ or $\diamond\diamond_{\diamond\diamond+1}/\diamond\diamond_{\diamond\diamond}$.