CONM Assignment

Assignment 1: Errors

1. Explain the different types of errors that occur during computation.

Assignment 2: Root finding methods

1. Explain the Bisection method graphically.
2. Explain the advantages and disadvantages of Bisection method
3. Find the root of the following using Bisection Method:
    a. $f(x) = x^3 - x - 1 = 0$
    b. $f(x) = xe^x = 1$
4. How many iterations do you need in Bisection Method to get the root if you start with a = 1 and b = 2 and the tolerance is 10^{-4}?
5. Explain the False Position or Regula Falsi method graphically.
6. Explain the advantages and disadvantages of False Position method
7. Find the root of the following using False Position Method:
    a. $f(x) = x\log_{10} x = 1.2$
    b. $f(x) = x^3 + x - 1 = 0$
8. Explain the advantages and disadvantages of Secant method
9. Find the root of the following using Secant Method:
    a. $f(x) = 3x - cosx - 1$
    b. $f(x) = xe^x = 1$
10. Explain graphically the conditions in which the Newton Raphson method fails to converge.
11. Find the root of the following using Newton Raphson Method:
    a. Find an approximation to $\sqrt{5}$ to four decimal places
    b. $f(x) = x - 2sinx$
12. What is the importance of Secant method over Newton-Raphson method?
13. Find the root of the following using Fixed Point Method:
    a. $f(x) = 3x - cosx - 1$
    b. $f(x) = e^{-x} - x$
14. Explain graphically the convergence and divergence of the Fixed Point method.