Assignment I

(Do it your notebook, first try to see the solutions using your c code, then do it by hand using calculator.)

1. Explain in brief about the types of errors in Numerical calculations.
2. Define Taylor’s theorem. Write its application and features.
3. Differentiate between bracketed and unbracketed (open) methods of finding the roots of nonlinear equations.
4. Estimate a real root of following nonlinear equation x2 sinx + e-x = 3 using bisection method. Correct up to two significant figures.
5. Discuss the convergences in bisection, NR and Secant methods.
6. Find the real root of f(x) = x - e-x by using Newton’s method (Newton-Raphson method). Correct up to four significant digits. (ans: 0.56714)
7. Explain the idea of the Secant method to estimate the root of any equation. Using the Secant method, estimate the real root of x2 - 4x -10 = 0.
8. Using secant method, estimate the real root of the function x2 + ln (x) = 3 up to accuracy of two decimal places.
9. Find the root of equation sinx-5x+2 = 0 up to four decimal places using fixed point iteration method.

(ans:0.4950)