Assignment 1
Computer based Numerical and Statistical Technique (CBNST)

1. Define the absolute, relative and percentage error.

2. Define floating point and normalized floating point numbers. Represent 44.85 x 10^6 in normalized point mode.

3. If $\frac{10}{3}$ is approximate at 3.33 then find absolute and relative errors. $E_a = 0.003333, E_r = 0.000999$

4. Find the absolute, relative and percentage errors if x is rounded-off to three decimal digits. Given $x = 0.005998$. Ans. $E_a = 0.000002, E_r = 0.0003334, E_p = 0.033344.$

5. If $R = \frac{4xy^2}{z^3}$ and the errors in x, y, z are 0.001, then find the maximum relative error at $x = y = z = 1$. Ans. 0.006

6. If $R = \frac{5xy^2}{z^3}$ and the errors in x, y, z are 0.001 at $x = y = z = 1$, then find the maximum relative error. Ans. 0.006

7. Use bisection method to find the real root of $e^x = 3x$ correct upto three decimal places. Ans. 1.512

8. Compute real root of the equation $3x + \sin x - e^x = 0$ correct upto four decimal places using bisection method. Ans. 0.3604

9. Find a real root of equation $\cos x = 3x - 1$ correct to four decimal places using iteration method. . Ans. 0.6071

10. Find the real of the equation $x^2 - 2x - 1 = 0$ lies between 1 and 3, correct upto three decimal places using Regula-Falsi method. Ans. 2.414

11. Determine the real of the equation $xe^x - 3 = 0$ using False position method, correct upto four decimal places. Ans. 1.0498

12. Use Newton-Raphson method to find the cube root of a number N, where N is positive number.

13. Find a positive value of $(17)^{\frac{1}{3}}$ correct up to four decimal places by Newton-Raphson method. Ans: 2.5712

14. Find the real root of the equation $\log_e x - \cos x = 0$ correct up to four decimal places by Newton-Raphson method. Ans: 1.3030