Name: **Lab# 04** **Your ID #:**

Comparison of Root Finding Methods

Please answer the below questions:

Q1 (*5pts*): Estimates of the root of: **x-cos(x)=0** to get more than **13** correct digits using:

(a) Newton (x_0=0.8)

(b) Bisection method (initial interval [0.6, 0.8])

(c) Secant method (x_0=0.6, x_1=0.8)

Discuss the accuracy and efficiency between these methods.

Q2 (*5pts*): Use Newton's method to find solutions accurate to within 10^{-5} for the following problems

a. $e^x + 2^{-x} + 2\cos x - 6 = 0 \quad \text{for } 1 \le x \le 2$

b. $\ln(x-1) + \cos(x-1) = 0 \quad \text{for } 1.3 \le x \le 2$

Q3 (*5pts*): Solve the system:

$$xy+x^2-y^3-1=0$$

$$x+2y-xy^2-2=0$$

Hint: Here $f_1(x,y)= xy+x^2-y^3-1$ and $f_2(x,y)= x+2y-xy^2-2$

Show the solution in the below format:

n	x	y
0	0.34	0.5
1	1.0896157	0.6101134
2	0.8689638	0.9595518
..		
..		
20	….	……