UNIVERSITY OF DHAKA

Department of Mathematics

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

Subject: Mathematics

Course No: **MTH 250** Course Title: **MATH Lab II**

Assignment-4

Name:	**Roll:**	**Group:**

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

Q1. Use (i) Bisection method, (ii) Fixed point iteration method and (iii) Newton-Raphson's method, (iv) Method of False position to find a real root of the equation $f(x) = 0$ correct up to five decimal places where, (a) $f(x) = \cos x - xe^x$, $(b)\ f(x) = \cos x - 3x + 1$.

Display the results in the following format:

n	x_n	$\lvert x_n - x_{n-1} \rvert$
1	.	.
2	.	.
.	.	.
.	.	.

Q2. (i) The following data are taken from the steam table, estimate the pressure at temperature $t = 142℃$ and $t = 156℃$ by using Newton's interpolation formula

Temp ℃	140	150	160	170	180	190
Pressure	3.685	4.854	6.302	8.076	10.225	11.055

(ii) Using (a) Lagrange's interpolation formula and (b) Newton divided difference formula compute the value of $F(X)$ at $X = 0.65$ for the following table:

X	0.0	0.2	0.4	0.6	0.8
$Y = F(X)$	1.00000	1.22140	1.49182	1.82212	2.22554

Q3. Evaluate the definite integral $\int_0^2 \frac{2}{x^2+4}\,dx$ by using

(i) Trapezoidal rule, (ii) Simpson's 1/3 rule, (iii) Simpson's 3/8 rule, (iv) Weddle's rule, and (v) Romberg integration. Also compare your results with exact value.