AHSANULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT
OF
ELECTRICAL AND ELECTRONIC ENGINEERING

LAB REPORT

COURSE NO   : EEE 2226
COURSE NAME   : Numerical Technique Laboratory
EXPERIMENT NO   : 08
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#Exercise 1:

Given f(x) =e^x, find $f'(1)$ using h=10^{-1}, 10^{-2},,,, upto 10^{-10}. Find out the error in each case by comparing the calculated value with exact value (Use forward difference formula).

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R07E01.m R07E02.m R07E03.m R07E04.m R07E05.m R08E01.m +

```
1 -    clc;
2 -    close all;
3 -    clear;
4 -    f = @(x) exp(x);
5 -    x0 = 1;
6 -    exact = exp(x0);
7 -    h = 10.^-(1:10);
8
9 -    for i = 1:length(h)
10 -        df(i) = (f(x0 + h(i)) - f(x0)) / h(i);
11 -        err(i) = abs(df(i) - exact);
12 -    end
13
14
15 -    disp('   h           Derivative      Error')
16 -    disp([h' df' err'])
17
18
```

Workspace   Command Window

h	Derivative	Error
0.1000	2.8588	0.1406
0.0100	2.7319	0.0136
0.0010	2.7196	0.0014
0.0001	2.7184	0.0001
0.0000	2.7183	0.0000
0.0000	2.7183	0.0000
0.0000	2.7183	0.0000
0.0000	2.7183	0.0000
0.0000	2.7183	0.0000
0.0000	2.7183	0.0000

fx >>