Experiment No. 01

1.1 Experiment Name

Introduction to MATLAB programming

1.2 Objectives

- To become acquainted with the MATLAB functions and necessary parameters
- To learn how to implement MATLAB code to a system using computational methods

1.3 Apparatus

- MATLAB

1.4 Problem

(i)

Roll	CT1	CT2	CT3	CT4	CT5	CT6
1801170	10	13	14	12	16	15
1801171	11	14	15	18	15	14
1801172	14	10	15	18	17	14
1801173	16	12	15	20	17	14
1801174	12	11	14	18	16	14

(ii)

A	5	0	-10	27	1	15

1.5 MATLAB Code

1.5.1   For Problem (i)

```
clc; %Clears previous data from command window
clear all; %Removes all variables from the current workspace

cd('F:\Study material\Lab\3-2\Power System I'); %Changes file directory
x = xlsread('Exp01') %Imports data from excel file
fprintf('\n Roll No      \tCTI    CT2    CT3    CT4    CT5    CT6\n')
%Display the text
disp(x) %Display the data inside variable

n=length(x) ; %Determines the number of column

y = x(:,2:n) ; %Isolates the data to be averaged from the roll
fprintf('Marks:\n') %Display the text
disp(y) %Display the data inside variable

w = sort(y,2,'descend'); %Rearranging the columns in descending order. 2 is for descending
rawwise
```

```matlab
fprintf('\nSorting descending order rawwise: \n') %Display the text
disp(w) %display the data inside variable

z = w(:,1:3) %Takes the first three columns containing highest three marks
fprintf('\nBest three marks: \n') %Display the text
disp(z) %Display the data inside variable

m = mean(z,2) %Calculates mean of the highest three marks. 2 is for doing the action
rawwise
fprintf('\nAverage marks: \n') %Display the text
disp(m) %Display the data inside variable

Output = round(m) %Round the calculated data
fprintf('Rounding the average marks: \n') %Display the text
disp(Output) %display the value inside variable

Roll=x(:,1) %Taking the column of Roll
Y=[Roll Output] %Forming a matrix of column Roll and Attained data as marks
fprintf(' Roll No Attained Marks \n') %Display the text
disp(Y) %Display the marks inside variable
```

1.5.2 For Problem (ii)

```matlab
clc; %Clears previous data from command window
clear all; %Removes all variables from the current workspace

cd('F:\Study material\Lab\3-2\Power System I'); %Changes file directory
Matrix=xlsread('Exp01p02'); %Reads from excel file
fprintf('Matrix:'); %Prints the data
disp(Matrices) %Shows the output

n=length(Matrix); %Determines the number of elements

%Ascending
for j=1:n %Campare first elements
    for k=j+1:n %Campare second elements
        if Matrix(j)>=Matrix(k) %Compare greater or not
            m=Matrix(j); %Store the greater number in a variable
            Matrix(j)=Matrix(k); %Replace the greater number by the smaller one
            Matrix(k)=m; %Replace the smaller number with greater number
        end
    end
end
fprintf('Ascending: '); %Print the data in desired order

%Descending
disp(Matrix) %Show the output
Output=xlsread('Exp01p02'); %Read from excel file
n=length(Output); %Read the number of elements
for j=1:n %Campare first elements
    for k=j+1:n %Campare second elements
        if Output(j)<=Output(k) %Compare samller or not
```

```matlab
            m=Output(j);%Store the smaller number in a variable
            Output(j)=Output(k);%Replace the smaller number by the smaller one
            Output(k)=m; %Replace the greater number with smaller number
        end
    end
end
fprintf('Descending: '); %Printing the data
disp(Output) %Show the output
```

1.6 Output
1.6.1   For Problem (i)

x =

1801170	10	13	14	12	16	15
1801171	11	14	15	18	15	14
1801172	14	10	15	18	17	14
1801173	16	12	15	20	17	14
1801174	12	11	14	18	16	14
1801175	15	10	14	17	19	14

Roll No	CTI	CT2	CT3	CT4	CT5	CT6
1801170	10	13	14	12	16	15
1801171	11	14	15	18	15	14
1801172	14	10	15	18	17	14
1801173	16	12	15	20	17	14
1801174	12	11	14	18	16	14
1801175	15	10	14	17	19	14

Marks:
10	13	14	12	16	15
11	14	15	18	15	14
14	10	15	18	17	14
16	12	15	20	17	14
12	11	14	18	16	14
15	10	14	17	19	14

Sorting descending order rawwise:
16	15	14	13	12	10
18	15	15	14	14	11
18	17	15	14	14	10
20	17	16	15	14	12
18	16	14	14	12	11
19	17	15	14	14	10

z =

16   15   14

```
18    15    15
18    17    15
20    17    16
18    16    14
19    17    15
```

Best three marks:
```
16    15    14
18    15    15
18    17    15
20    17    16
18    16    14
19    17    15
```

m =

```
15.0000
16.0000
16.6667
17.6667
16.0000
17.0000
```

Average marks:
```
15.0000
16.0000
16.6667
17.6667
16.0000
17.0000
```

Output =

```
15
16
17
18
16
17
```

Rounding the average marks:
```
15
16
17
18
16
17
```

Roll =

```
1801170
1801171
1801172
1801173
1801174
1801175

Y =

1801170      15
1801171      16
1801172      17
1801173      18
1801174      16
1801175      17

Roll No Attained Marks
1801170      15
1801171      16
1801172      17
1801173      18
1801174      16
1801175      17
```

1.6.2   For Problem (ii)
Matrix: 5   0   -10   27   1   15   30

Ascending: -10   0   1   5   15   27   30

Descending: 30   27   15   5   1   0   -10

1.7 Discussion & Conclusion

We used MATLAB code to solve the problem in this experiment. In the first problem, which is quite practical, we find the average class test score for six different students. In this case, we calculated the output for each student by taking the best three marks and averaging them. The elements of a 7x1 matrix were sorted in both ascending and descending order in the second problem.

Through this experiment, we become acquainted with the implementation and scope of MATLAB in computational methods and systems by solving these problems. Thus the objective of the experiment was achieved.