UNIVERSITI KUALA LUMPUR

MALAYSIAN INSTITUTE OF CHEMICAL AND BIO-ENGINEERING TECHNOLOGY

FINAL EXAMINATION

OCTOBER 2025 SEMESTER

COURSE CODE	:	CLB12303
COURSE TITLE	:	INTRODUCTION TO COMPUTER PROGRAMMING
PROGRAMME NAME	:	TECHNICAL FOUNDATION - BACHELOR
DATE	:	03 FEBRUARY 2026
TIME	:	2:00PM - 5:00PM
DURATION	:	3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.
2. This question paper is printed on both sides of the paper.
3. This question paper consist of TWO sections.
4. Answer ALL questions for Section A.
5. Section B consist of four questions. Answer THREE (3) questions only.
6. Please write your answer on the answer booklet provided.
7. Please answer all questions in English only.
8. Please answer MCQ/EMQ questions using OMR sheet. ☐ *Tick if applicable*
9. Refer to the attached Formula/ Appendies. ☐ *Tick if applicable*

SECTION A (Total: 40 marks)

Answer ALL questions.

Please use the answer booklet provided.

Question 1

Explain how to work in the MATLAB Command Window. Include **at least five commands** used for basic operations such as clearing the screen, clearing variables, checking variables, and getting help.

(10 marks)

Question 2

Explain about flowcharts and pseudocode. Include in the explanation the standard symbols used in flowcharts, and write an example of pseudocode to find the sum of two numbers.

(10 marks)

Question 3

Consider two MATLAB variables, A and B, defined as follows:
Matlab

```
A = [1 2; 3 4];
B = [5 6; 7 8];
```

For each of the following MATLAB expressions, predict the output and briefly explain the reasoning behind the result, specifically differentiating between matrix and array operations where applicable:

(a) A* B

(4 marks)

(b) A .* B

(4 marks)

(c) A + B

(4 marks)

(d) A ./ B

(4 marks)

(e) A'

(4 marks)

SECTION B (Total: 60 marks)

Answer THREE (3) questions only.

Please use the answer booklet provided.

Question 1

Answer the following:

(a) The following program is intended to perform a simple calculator operation using **switch.**
It contains errors.

```
a = input('Enter first number: ')
b = input('Enter second number: ');
choice = input('Enter choice (1-add,2-sub): ');
switch choice
case = 1
result = a + b
disp 'Addition = '
disp(result)
case 2
result = a - b;
disp('Subtraction = ')
disp(result)
otherwise
disp('Invalid choice')
```

i. Identify any **four** errors in the code.

(4 marks)

ii. Rewrite the corrected MATLAB program.

(6 marks)

(b) Write a MATLAB script to perform the following:

i. Create a vector x from **0 to 2π** with step size **0.01**.

(2 marks)

ii. Plot **sin(x)** and **cos(x)** on the **same graph** using the plot command.

(4 marks)

iii. Add the following formatting features: **grid**, **legend**, **title**, **x-label**, **y-label**.

(4 marks)

Question 2

Answer the following :

(a) A student is required to calculate the **area and perimeter of a rectangle** using a **user-defined function** in MATLAB.

i. Write a user-defined function named rectCalc that accepts two inputs: L (length) and W (width). The function must return two outputs: A (area) and P (perimeter).

(4 marks)

ii. Write a MATLAB script to input values for L and W, call the function rectCalc, and display the area and perimeter clearly.

(6 marks)

(b) Predict the output of the following MATLAB program. Show the values of i and sum in each iteration and write the final output displayed.
Refer Below - Figure1 : Matlab coding .

(10 marks)

```matlab
i = 1;
sum = 0;

while i <= 6
    if mod(i,2) == 0
        sum = sum + i;
    else
        sum = sum + 1;
    end
    i = i + 1;
end

disp(sum)
```

Figure 1: Matlab coding

Question 3

Answer the questions below:

(a) A row vector is given as:
R=[3 6 9 12 15]

i. Create the row vector R in MATLAB and convert it into a column vector C

(2 marks)

ii. Modify R by replacing the 4th element with 100.

(2 marks)

iii. Extract the 2nd row of A and store it in vector V

(2 marks)

(b) Create the matrix:
Refer Below - Figure2 : Matlab matrix .

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$

Figure 2: Matlab matrix

i. Write MATLAB statements to create matrix A

(2 marks)

ii. Replace the element in row 3, column 2 with 20.

(2 marks)

iii. Extract the 2nd row of A and store it in vector V.

(2 marks)

(c) A square matrix is given as:
Refer Below - Figure3 : Matlab matrix .

$$A = \begin{bmatrix} 2 & 1 \\ 3 & 4 \end{bmatrix}$$

Figure 3: Matlab matrix

i. Find the transpose of matrix A and store it in AT.

(2 marks)

ii. Find the inverse of matrix A and store it in AI.

(3 marks)

iii. Compute the matrix multiplication ***A× AI*** and store it in **P.**

(3 marks)

Question 4

Answer all the questions below:

(a) Predict the output of the following MATLAB code. Show the final values of a, b, c, and d.
Refer Below - Figure4 : Matlab coding .

(8 marks)

```
matlab

a = 12;
b = 5;
c = a/b;
d = a - b*2 + a^2;
disp(c)
disp(d)
```

Figure 4: Matlab coding

(b) Identify the mistake in the following code and rewrite the corrected version.
Refer Below - Figure5 : Matlab coding .

(4 marks)

```
matlab

x = 1:5;
y = x^2 + 2*x;
disp(y)
```

Figure 5: Matlab coding

(c) Predict the output of the following MATLAB program.
Refer Below - Figure6 : Matlab coding .

```matlab
a = 5;
v = [2 4 6];
M = [1 2; 3 4];

x = a * v;
y = M * [1; 2];
disp(x)
disp(y)
```

Figure 6: Matlab coding

i. Identify the type of each variable (a, v, and M).

(3 marks)

ii. Show the final values of all variables.

(5 marks)

END OF EXAMINATION PAPER