

**UNIVERSITY COLLEGE TATI (UC TATI)****FINAL EXAMINATION QUESTION BOOKLET**

COURSE CODE : DCT1123
COURSE : PROBLEM SOLVING AND ALGORITHMS
SEMESTER/SESSION : 1/2022-2023
DURATION : 3 HOURS

Instructions:

1. This booklet contains 5 questions. Answer **ALL** questions.
2. All answers should be written in the answer booklet.
3. Write legibly and draw sketches wherever required.
4. If in doubt, raise your hands and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

THIS BOOKLET CONTAINS 5 PRINTED PAGES INCLUDING COVER PAGE

QUESTION 1

- a) Describe **TWO (2)** problems of using natural language for representing algorithms. (4 marks)
- b) Describe these algorithmic operations. (6 marks)
- Sequence
 - Selection
 - Repetition
- c) Differentiate between *pre-test* and *post-test* loops. Give example for each loop. (10 marks)

QUESTION 2

Kindly refer to the program in Figure 1.

```
Sila masukkan tinggi anda (dalam meter) : 1.65
Sila masukkan berat anda (dalam kg) : 42
BMI anda adalah : 15.4

Terima kasih

...Program finished with exit code 0
Press ENTER to exit console.
```

Figure 1

The program:

- Receives input in the form of height (in meter) and weight (in kilogram),
- Calculates BMI based on the formula below:

$$\text{BMI} = \text{weight (kg)} / (\text{height (m)}^2)$$

- Display the BMI,
- Display "Thank you", and
- Terminates.

- a) Prepare the pseudocode for the above program. (8 marks)
- b) Prepare the flowchart for the above program. (12 marks)

QUESTION 3

Kindly refer to the program in Figure 2.

```
Sila masukkan nama anda: Lofa
Sila masukkan NRIC anda: 890530115774
Selamat datang Puan Lofa

Sila masukkan nama anda: Haris
Sila masukkan NRIC anda: 950502065011
Selamat datang Tuan Haris

...Program finished with exit code 0
Press ENTER to exit console.
```

Figure 2

The program:

- Receives input in the form of name and NRIC,
 - Determine the gender based on NRIC,
 - Display the greetings "**Welcome Mr.**" and name if the gender is male,
 - Display the greetings "**Welcome Mrs.**" and name if the gender is female, and
 - Terminates.
- a) Prepare the pseudocode for the above program. (8 marks)
- b) Prepare the flowchart for the above program. (12 marks)

QUESTION 4

Kindly refer to the program in Figure 3.

```
Sila masukkan nama : Waafa
Sila masukkan program : DCIT

Sila masukkan nama : Aimi
Sila masukkan program : BCSC

Sila masukkan nama : Ikhmal
Sila masukkan program : BCNS

Jumlah pelajar : 3
Terima Kasih

...Program finished with exit code 0
Press ENTER to exit console.
```

Figure 3

The program:

- Receives input in the form of name and program for 3 students,
- Display the total number of students,
- Display "Thank you", and
- Terminates.

a) Prepare the pseudocode for the above program. (Hint: the program uses **for** loop).

(10 marks)

Kindly refer to the program in Figure 4.

```
Sila masukkan nombor: 3
6
12
24
48
96
Selesai

...Program finished with exit code 0
Press ENTER to exit console.

Sila masukkan nombor: 5
10
20
40
80
Selesai

...Program finished with exit code 0
Press ENTER to exit console.
```

Figure 4

The program:

- Receives input in the form of an integer,
- Multiplies the integer with 2,
- Display the results if it is less than 100,
- Repeats multiplication until the result reaches 100,
- Displays "Completed", and
- Terminates.

b) Prepare the pseudocode for the above program. (Hint: the program uses **while** loop).

(10 marks)

QUESTION 5

Kindly refer to the program in Figure 5.

```
Sila masukkan nombor: 44
Nombor Genap
Anda ingin teruskan (Y/T): Y

Sila masukkan nombor: 55
Nombor Ganjil
Anda ingin teruskan (Y/T): Y

Sila masukkan nombor: 66
Nombor Genap
Anda ingin teruskan (Y/T): T

...Program finished with exit code 0
Press ENTER to exit console.
```

Figure 5

The program:

- Receives input in the form of an integer,
- Displays "Even Number" if the integer is even,
- Displays "Odd Number" if the integer is odd, and
- Continues receiving input as long as the user wants to.

Prepare the flowchart for the above program. (Hint: the program uses **do..while** loop)

(20 marks)

----- End of Question -----

