

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

COURSE CODE	: DCT1123
COURSE	: PROBLEM SOLVING AND ALGORITHMS
SEMESTER/SESSION	: 2/2022-2023
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 7 PRINTED PAGES INCLUDING COVER PAGE

QUESTION 1

- a) In your own words, define **pseudocode**. (2 marks)
- b) In your own words, define **flowchart**. (2 marks)
- c) Algorithmic operations can be divided into sequence, selection and repetition. Describe **sequence**. Support your answer with appropriate illustration. (6 marks)
- d) Describe **THREE (3)** types of data that are stored by the computer. (6 marks)
- e) Describe **post-test** loops. (4 marks)

QUESTION 2

A computer program:

- Receives input in the form of length and width of a rectangle,
- Calculates the area based on the formula below:

$$\text{area} = \text{length} * \text{width}$$

- Displays the area,
- Displays "Program Tamat", and
- Terminates.

Example of the program output is illustrated in Figure 1.

```
DCT 1123 FINAL EXAM
Question 2

Sila masukkan panjang (cm) : 4
Sila masukkan lebar (cm) : 3
Luas segiempat adalah : 12 cm persegi

Program Tamat

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

Figure 1

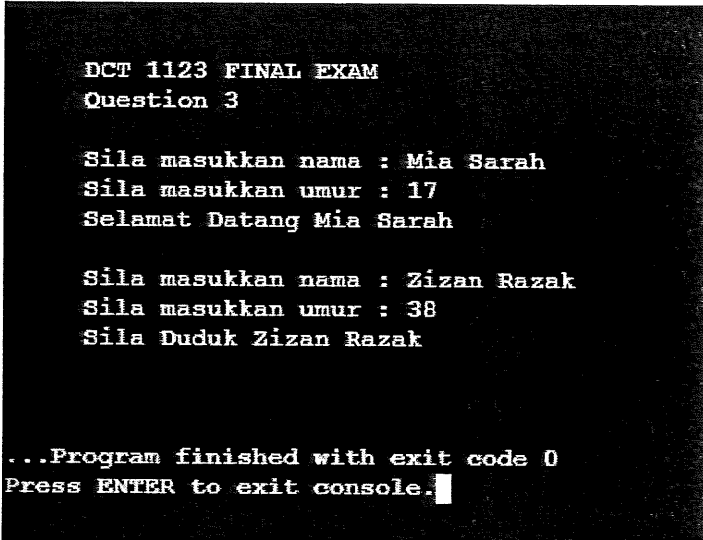
- a) Prepare the pseudocode for the program. (8 marks)
- b) Prepare the flowchart for the program. (12 marks)

QUESTION 3

A computer program:

- Receives input in the form of name and age,
- Displays “Selamat Datang” and name if age is less than 21,
- Displays “Sila Duduk” and name if age is equal to or larger than 21, and
- Terminates.

Example of the program output is illustrated in Figure 2.



```
DCT 1123 FINAL EXAM
Question 3

Sila masukkan nama : Mia Sarah
Sila masukkan umur : 17
Selamat Datang Mia Sarah

Sila masukkan nama : Zizan Razak
Sila masukkan umur : 38
Sila Duduk Zizan Razak

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

Figure 2

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

QUESTION 4

A computer program:

- Receives input in the form of hours work for 5 days,
- Displays the average working hours per day using the formula below, and

$$\text{Average} = \frac{\text{Working Hours (Day 1 + Day 2 + Day 3 + Day 4 + Day 5)}}{5 \text{ days}}$$

- Terminates.

Example of the program output is illustrated in Figure 3.

```
DCT 1123 FINAL EXAM
Question 4(a)

Sila masukkan jam bekerja : 8.50
Sila masukkan jam bekerja : 8.25
Sila masukkan jam bekerja : 9.00
Sila masukkan jam bekerja : 9.50
Sila masukkan jam bekerja : 10.25

Purata masa bekerja adalah : 9.1 jam

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

Figure 3

- a) Prepare the pseudocode for the program using the for loop. (10 marks)

A computer program:

- Receives input in the form of monthly savings and savings duration,
- Displays the monthly cumulative total,
- Repeats until the savings duration,
- Displays "Selesai", and
- Terminates.

Example of the program output is illustrated in Figure 4.

```
DCT 1123 FINAL EXAM
Question 4(b)

Sila masukkan jumlah simpanan      : RM 50
Sila masukkan jangkamasa simpanan  : 16

Simpanan terkumpul bulan 1: RM 50
Simpanan terkumpul bulan 2: RM 100
Simpanan terkumpul bulan 3: RM 150
Simpanan terkumpul bulan 4: RM 200
Simpanan terkumpul bulan 5: RM 250
Simpanan terkumpul bulan 6: RM 300
Simpanan terkumpul bulan 7: RM 350
Simpanan terkumpul bulan 8: RM 400
Simpanan terkumpul bulan 9: RM 450
Simpanan terkumpul bulan 10: RM 500
Simpanan terkumpul bulan 11: RM 550
Simpanan terkumpul bulan 12: RM 600
Simpanan terkumpul bulan 13: RM 650
Simpanan terkumpul bulan 14: RM 700
Simpanan terkumpul bulan 15: RM 750
Simpanan terkumpul bulan 16: RM 800

Selesai

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

Figure 4

b) Prepare the pseudocode for the program using **while** loop.

(10 marks)

QUESTION 5

A computer program:

- Receives input in the form of a price for an item,
- Displays “Mahal” if the price is RM 50.00 and above,
- Displays “Murah” if the price is less than RM 50.00, and
- Continues receiving input as long as the user wants to, and
- Displays “Terima Kasih” on exit.

Example of the program output is illustrated in Figure 5.

```
DCT 1123 FINAL EXAM
Question 5

Sila masukkan harga : RM 55.50
                    : Mahal
Teruskan (Ya/Tidak)? : Y

Sila masukkan harga : RM 12.00
                    : Murah
Teruskan (Ya/Tidak)? : T

Terima Kasih

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

Figure 5

Prepare the flowchart for the program using **do..while** loop.

(20 marks)

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

