UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2021/2022

COURSE NAME : ALGORITHM AND PROGRAMMING

COURSE CODE : BIC10204

PROGRAMME CODE : BIS/ BIP/ BIW

EXAMINATION DATE : JULY 2022

DURATION : 3 HOURS

INSTRUCTION :
1. ANSWER ALL QUESTIONS.
2. THIS FINAL EXAMINATION IS CONDUCTED VIA **CLOSED BOOK**.
3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK.

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

TERBUKA

Q1 As a nurse in a private clinic, Fina needs to generate Body Mass Index
(BMI) from their patients' list every morning.

(a) Write a program that can help Fina in calculating the BMI from the input in
"weheight.txt" file and write the BMI results to a separate "bmilist.txt" file as in
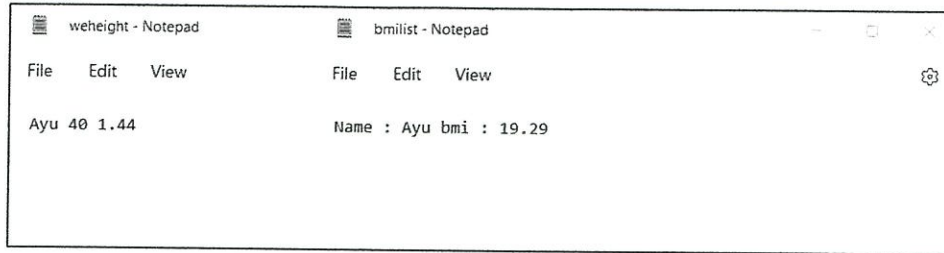**Figure Q1(a)**

Figure Q1(a)

(11 marks)

(b) Assuming there are no input and output files, write a program that helps Fina entered
the patients' details. Then, the program will return the patients' BMI and display the
BMI status listed in **Table Q1(b)**. Example of the output is shown in **Figure Q1(b)**.

Table Q1(b)

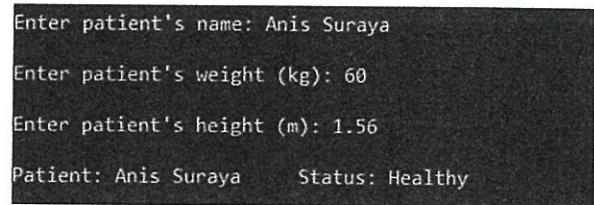| BMI	Status
Below 18.5	Underweight
18.5-24.9	Healthy
25.0-29.9	Overweight
30.0 and above	Obese

Figure Q1(b)

(13 marks)

(c) Based on your answer in **Q1(b)**, identify a function that can read string input and
takes all the data including space.

(2 marks)

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Q2   (a)   By using switch-case statement, write a program for the output in **Figure Q2(a)**. Please include all grades A, B, C, D, E, F and default statement below:

```
default: printf("No grade given/invalid grade");
```

```
Enter your grade for Algorithm and Programming course :A
Your grade for Algorithm and Programming course is A
```

Figure Q2(a)

(15 marks)

(b)   Draw a flowchart for your answer in **Q2(a)**.

(10 marks)

Q3   (a)   Identify **THREE (3)** types of repetition control structure.

(3 marks)

(b)   Write a valid C statement that requires user to input the current year and year of birth. By using **ONE (1)** of the repetition's type in **Q3(a)**, print a continuous statement from "You turns 1" and stop until the user's age "You turns x". **Figure Q3(b)** shows an example output of the program.

```
What is the current year now?2022
What is your year of birth?2011
You turns 1
You turns 2
You turns 3
You turns 4
You turns 5
You turns 6
You turns 7
You turns 8
You turns 9
You turns 10
You turns 11
```

Figure Q3(b)

(8 marks)

3

(c)   Suppose that the tuition fee for a university is RM1000 this year and will be increased 7% every year. Write a program to calculate the number of years will be taken to double up the tuition fee.

(10 marks)

(d)   Based on your answer in **Q3(c)**, display the number of years and the new tuition fee.

(4 marks)

Q4   Write a program to show multiplication table in **Table Q4**. Separate your calculation from the main function.

Table Q4

4	5	6	7	8	9
8	10	12	14	16	18
12	15	18	21	24	27
16	20	24	28	32	36
20	25	30	35	40	45
24	30	35	42	48	54

(11 marks)

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Q5   **Figure Q5** shows one example of a program script.

```
programG.c  X
 1    #include <stdio.h>
 2
 3    struct Book {
 4        char  title[50];
 5        char  author[50];
 6        char  subject[100];
 7        float  book_price;
 8    };
 9
10    int main( ) {
11
12        struct Books Book1;          // Declare Book1 of type Book
13        struct Books Book2;          // Declare Book2 of type Book
14
15        // Book 1 specification
16        strcpy( Book1.title, "C Programming");
17        strcpy( Book1.author, "Nuha Ali");
18        strcpy( Book1.subject, "C Programming Tutorial");
19        Book1.book_price = 64.95;
20
21        // Book 2 specification
22        strcpy( Book2.title, "Telecom Billing");
23        strcpy( Book2.author, "Zara Ali");
24        strcpy( Book2.subject, "Telecom Billing Tutorial");
25        Book2.book_price = 97.00;
26
27        // print Book1 info
28        printf( "Book 1 title : %s\n", Book1.name);
29        printf( "Book 1 author : %s\n", Book1.author);
30        printf( "Book 1 subject : %s\n", Book1.subject);
31        printf( "Book 1 book_price : %d\n", Book1.book_price);
32
33        // print Book2 info
34        printf( "Book 2 title : %s\n", Book2.title);
35        printf( "Book 2 author : %s\n", Book2.author);
36        printf( "Book 2 subject : %s\n", Book2.subject);
37        printf( "Book 2 book_price : %d\n", Book2.book_price);
38
39        return 0;
40    }
```

Figure Q5

(a)   Based on **Figure Q5**, identify **FIVE (5)** mistakes in the program by listing the line's number.

(5 marks)

(b)   If **ALL** mistakes listed in **Q5(a)** has been corrected, what would be the output for the program?

(8 marks)

-END OF QUESTIONS-

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