Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2021/2022

COURSE NAME	:	ALGORITHM AND PROGRAMMING
COURSE CODE	:	BIC 10204
PROGRAMME CODE	:	BIS / BIP / BIW / BIM
EXAMINATION DATE	:	JANUARY / FEBRUARY 2022
DURATION	:	3 HOURS
INSTRUCTION	:	1. ANSWER **ALL** QUESTIONS. 2. THIS FINAL EXAMINATION IS CONDUCTED ONLINE AND CLOSE BOOK

THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

Q1 Write C programs to print the multiplication table of 5 from 1 to 10, by using `do - while` loop.

(5 marks)

Q2 Write an interactive C program using `if - else` statement, to input water unit charge and calculate the total water bill according to the given condition:

For the first 50 units RM 0.40/unit
For the next 100 units RM 0.80/unit
For the next 100 units RM 1.20/unit
For above 250 units RM 1.55/unit

An additional surcharge of 15% is added to the bill.

(15 marks)

Q3 Based on **Table 1**, you are required to write a C program to calculate an assessment mark for a student, which receives input of user's tests, homeworks, midterm and final mark using `while` loop. The program will then calculate Grand Total and Grade based on the given calculation method and **Table 2**.

TABLE 1: Student's Assesment Mark

Assessment	Mark
Test1	70
Test2	70
Test3	70
Total Test	14
Hw1	40
Hw2	40
Hw3	40
Hw4	40
Hw5	40
Hw6	40
Total HW	24
Mid Term	70
Total Mid Term	7
Final	70
Total Final	28
Grand Total	**73**
Grade	**?**

TABLE 2: Grade Classification

Marks range	Grade
GrandTotal >= 80	A
(GrandTotal >= 70 && GrandTotal < 80)	B
(GrandTotal >= 60 && GrandTotal < 70)	C
(GrandTotal >= 50 && GrandTotal < 60)	D
(GrandTotal >= 40 && GrandTotal < 50)	E
GrandTotal < 40	Failed

Calculation method:
Total test = ((test1 + test2 + test3) / 300) × 20%
Total Hw = ((Hw1 + Hw2 + Hw3 + Hw4 + Hw5 + Hw6) / 300) × 30%
Total Mid Term = 10% from the midterm marks
Total Final = 40% from the final exam marks
Grand Total = ?
Grade = ?

Example of output:

```
Enter test1        : 70
Enter test2        : 70
Enter test3        : 70
Total Test         : 14.00
Enter hw1          : 40
Enter hw2          : 40
Enter hw3          : 40
Enter hw4          : 40
Enter hw5          : 40
Enter hw6          : 40
Total HW           : 24.00
Enter Mid Term     : 70
Total Mid Term     : 7.00
Enter Final        : 70
Total Final        : 28.00

Your total mark is : 73.00
Grade = B
```

(15 marks)

Q4 Based on **Figure Q4**, answer the following questions.

```
This program draws a triangle on the screen
My name is <print your name>
My matric no is <print your matric ID>
I want to print triangle so will select no 1 = 1

          /\
         /  \
        /    \
       /      \
      /        \
     /          \
    /            \
   /              \
  /                \
 ----------------------
Please enter 'y' to continue : y
```

Figure Q4

(a) Write pseudocode to print your Name and Matric ID. Then, request a user to invoke selection number 1 to print the menu and triangle as shown in **Figure Q4**.

(6 marks)

(b) Write the C program that can print your Name, Matric ID and the triangle design. Using a `while` loop, the program allows the user to repeat the process by invoking letter 'y' and the process will be terminated when the user invokes any letter, except letter 'y'. The program consists of the following functions:

- `Main` – call the other function to print messages. Then, prompt and ask user to invoke number 1 to call other functions to print a triangle. Afterward, prompt and ask user to invoke letter 'y' to repeat the process as shown in **Figure Q4**.
- `print_menu` – print messages including your Name and Matric ID as shown in **Figure Q4**.
- `draw_triangle` – print a triangle.

(17 marks)

Q5 Given days = "Sunday", "Monday", "Tuesday", "Wednesday", "Thursday", "Friday","Saturday". Write a complete C program using an array that permits interaction with the user in this manner.

Example of output:

```
Enter a Day Number : 3
The day name = Tuesday
```

(5 marks)

Q6 Based on **Figure Q6**, answer the following questions.

```
Enter pump number       : 5
Enter fuel type         : RON97
Enter Price per litre   : RM 3.06



:::::::::: Fuel Details ::::::::::

Pump Number     : 5
Fuel Type       : RON97
Price per litre : 3.06
```

Figure Q6

(a) Define a structure of fuel containing the details such as `pumpNo`, `fuelType` and `pricePerLitre`.

(4 marks)

(b) Based on the answer in **Q5 (a)**, write a program that accepts from a user and displays the fuel details using structure with pointer.

(13 marks)

-END OF QUESTIONS –