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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2022/2023**

COURSE NAME : ALGORITHM AND PROGRAMMING

COURSE CODE : BIC 10204

PROGRAMME CODE : BIP / BIS / BIW / BIM

EXAMINATION DATE : FEBRUARI 2023

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.

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THIS QUESTION PAPER CONSISTS OF SIX (6) PAGES

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Q1 Write a complete C program that uses **TWO (2)** functions named as square and cube using for loop to calculate the squares and cubes of the integers from 1 to 10. Output should be displayed as **Figure Q1**.

```
Square number:1 4 9 16 25 36 49 64 81 100
Cube number:1 8 27 64 125 216 343 512 729 1000
```

Figure Q1

(8 marks)

Q2 Write a complete interactive C program using `if ... else` statement, to ask the user to input height and weight of a candidate for military admission application. The candidate acceptance according to the given requirement:

- Height
 - Men's minimum height: 1.62m
 - Women's minimum height: 1.57m
- Weight
 - Men's minimum weight:47.5kg
 - Women's minimum weight:45kg
- Body Mass Index (BMI):
 - Body Mass Index for Men and Women not exceeding 26.0
 - $BMI = \text{weight} / (\text{height} * \text{height})$

The output should be displayed as **Figure Q2(a)** for pass application and **Figure Q2(b)** for fail application.

```
Application For Military Admission
=====
==Gender==
1.Male
2.Female

Select gender :
1
Enter height (meter) :1.65
Enter weight (kg):50
Congratulations, you passed the selection
```

Figure Q2(a)

```
Application For Military Admission
=====
==Gender==
1.Male
2.Female

Select gender :
1
Enter height (meter) :1.61
Enter weight (kg):47.5
Sorry, you didn't pass the selection
```

Figure Q2(b)

(10 marks)

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Q3 Write a complete interactive C program that performs calculator operation by allowing user to enter TWO (2) numbers. The functions in Table Q3 must be created:

Table Q3

| Function name | Operation |
|---------------|---------------------------|
| add() | To perform addition |
| subtract() | To perform subtraction |
| multiply() | To perform multiplication |
| divide() | To perform division |
| display() | To print the result |

The choice of add(), subtract(), multiply(), divide() and display() need to be implemented using switch...case statement. Output should be displayed as Figure Q3(a) for valid input and Figure Q3(b) for invalid input by user.

```

Enter two numbers: 2
3
*****
1.Addition
2.Subtraction
3.Multiplication
4.Division
Enter your choice: 4
2.00 / 3.00 = 0.67
*****

```

Figure Q3(a)

```

Enter two numbers: kk
*****
1.Addition
2.Subtraction
3.Multiplication
4.Division
Enter your choice: Invalid input.Please enter correct input.
*****

```

Figure Q3(b)

(22 marks)

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Q4 Based on **Figure Q4**, answers **Q4(a) – Q4(f)**.

```

The Algorithm Sdn. Bhd. sells five (5) different types of jacket namely
as jacket 1, jacket 2, jacket 3, jacket 4 and jacket 5. The supervisor
needs to keep daily sales of each type of jacket and total daily sales
using the program that you are asked to develop. In your program should
able read the sales for each type of jacket, display the sales for each
type of jacket and calculate the total daily sales for 5 types of
jacket with two floating numbers.

Here is an example of an output:

DAYLY SALES FOR 5 JACKET

--Input Sales of JACKETS--

Jacket 1 >> 250.50 //supervisor will input the total sales for each
Jacket 2 >> 100.70 //jacket
Jacket 3 >> 350.50
Jacket 4 >> 400.30
Jacket 5 >> 180.00

--Display Sales FOR 5 JACKETS--
Sales of each Jacket

Sales for Jacket 1: 250.50
Sales for Jacket 2: 100.70
Sales for Jacket 3: 350.50
Sales for Jacket 4: 400.30
Sales for Jacket 5: 180.00

Total Daily Sales : RM 1282.00

```

Figure Q4

- (a) Declare an array called `jack` to keep the information for jackets sales by Algorithm Sdn, Bhd. (2 marks)
- (b) Write a program segment to read daily sale of all jackets by using for loop into array declared in **Q4(a)**. Your program segment should ask the user to enter the input. (6 marks)
- (c) Write a program segment to display the information entered in **Q4(b)**. (4 marks)
- (d) Write a program segment to calculate total daily sales based on information entered in **Q4(b)**. (4 marks)
- (e) Write a program segment displaying the total daily sales calculated in **Q4(d)**. (2 marks)
- (f) Write a complete program. (2 marks)

Q5 (a) Based on **Figure Q5(a)(i)** and **Figure Q5(a)(ii)** answers **Q5(a)(i)** and **Q5(a)(ii)**.

```

#include <stdio.h>

int main()
{
    int miles, dist, temp;
    int *int_addr;

    dist=40;
    miles = 10;

    //PART A
    int_addr = &miles;
    temp = *int_addr;
    printf("The value pointed to by int_addr is %d\n\n", temp);
    //END of PART A

    //PART B
    int_addr=&dist;
    temp = *int_addr;
    printf("The value pointed to by int_addr is %d\n\n",
temp);
    //END of PART B
}

```

Figure Q5(a)(i)

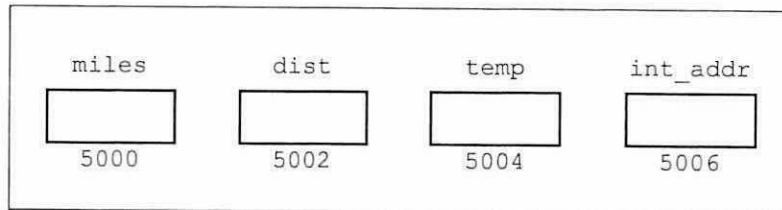


Figure Q5(a)(ii)

(i) Illustrate the memory after execution of PART A. (5 marks)

(ii) Illustrate the memory after execution of PART B. (5 marks)

(b) Based on **Figure Q5(b)** answer the **Q5(b)(i)** and **Q5(b)(ii)**.

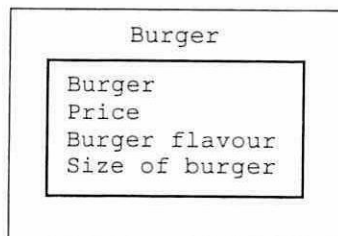


Figure Q5(b)

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- (i) Write a program segment of Burger record using `struct`. (6 marks)
- (ii) Declare an array called `b_array` to keep the **FIVE (5)** burger record. (2 marks)

-END OF QUESTIONS -

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