UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2022/2023

COURSE NAME	:	COMPUTER PROGRAMMING
COURSE CODE	:	DAE 20102
PROGRAMME CODE	:	DAE
EXAMINATION DATE	:	JULY / AUGUST 2023
DURATION	:	2 HOURS
INSTRUCTIONS	:	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 Puteri wants to record her monthly saving so that she can trace back the record at the end of each year. She builds a program using C++ language so that she can enter her saving for each month and calculate the total saving for a year. If the total saving is less than RM1000, she needs to add up another RM200. Otherwise, if the total saving is more than RM1300, she can take out RM100 as a reward. The program will show the total saving earned after the above condition is executed. Based on the above situation, answer the following questions:

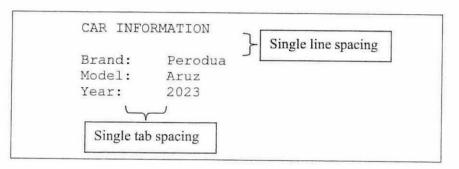(a) Identify the input, output and relevant formula.

(4 marks)

(b) Write the pseudocode of the program.

(8 marks)

(c) Sketch the flowchart of the program.

(8 marks)

Q2 (a) Write a program to display texts of the following format.

```
CAR INFORMATION          }─┤ Single line spacing

Brand:      Perodua
Model:      Aruz
Year:       2023
        └─┬─┘
   Single tab spacing
```

(5 marks)

(b) Analyze the following code, and predict the output of the program.

```cpp
int a = 5, b = 3, c = 7;
int t = 0;

a = a + 5;
cout << "Value of a: " << a << endl;

c++;
cout << "Value of c: " << c << endl;

if (c == 7)
{
    b = c % 2;
    cout << "Value of b: " << b << endl;
}
else
{
    a = ++c * 2;
```

```
        cout << "Value of a: " << a << endl;
    }

    t = a + b + c;
    cout << "The sum of (a + b + c): " << t << endl;

    t = a * b * c;
    cout << "The product of (a + b + c): " << t << endl;
```

(5 marks)

(c)   (i)   List down **three (3)** types of repetition statement in C++.

(3 marks)

(ii)   From **Q2(c)(i)**, determine the repetition statement that most suitable used for endless loop?

(1 mark)

(iii)   State which looping statement will be guaranteed to execute at least one time.

(1 mark)

(iv)   Write a program using *for* loop statement to print five numbers. The output of the program should be as follows:

```
    5 6 7 8 9
```

(5 marks)

Q3   A function in C++ programming is very useful for a long code. It can be called at any code block and can be ported to another program.

(a)   (i)   Referring to program below, label X, Y and Z with the correct the C++ function concepts.

```
#include <iostream>
using namespace std;

int sum(int, int);  ──────►  X

int main() {

    int a = 100;
    int b = 200;
    int result;
                        Y
    result = sum(a, b);
    cout << "Total value is :" << result << endl;
```

```
        result = sum(a,a);
        cout << "Total value is :" << result << endl;

        return 0;
}

int sum(int a, int b = 20) {
    int result;
    result = a + b;                    Z
    return (result);
}
```

(3 marks)

(ii)   Predict the output of the program in **Q3(a)(i)**.

(4 marks)

(b)   Write a program to calculate voltage across a resistor, V = IR. The program should allow users to enter resistor value and current value. By using the function concept, write the complete program.

(13 marks)

Q4   (a)   Define the terms below with the declaration format:
(i)   Array

(2 marks)

(ii)   String

(2 marks)

(b)   Given that

```
char grade[6];
```

(i)   Differentiate between grade[6] and grade6.

(2 marks)

(ii)   State the allocation of memory cell for data storage?

(1 mark)

(iii)   Define the type of data storage which can be stored?

(1 mark)

(iv)   Describe the method of referring to the first element array?

(1 mark)

(v)   Describe the method of describing the final element array?

(1 mark)

4

(c)   Consider the following declaration.

```
int num[3][2] = {{4,5,6},{7,8,9}};
```

(i)   Decide whether the declaration of variable num[3][2] is false or true.

(1 mark)

(ii)   Provide justification to support your answer in the **Q4(c)(i)**.

(2 marks)

(iii)   Write the code to show each value in the variable num[3][2].

(7 marks)

Q5   (a)   A structure in C++ is a user-defined data type that allows you to combine different variables of different data types under a single name.
Explain how :

(i)   To declare a structure.

(2 marks)

(ii)   To access members of a structure.

(2 marks)

(b)   Develop the main coding of the following problem statement:

(i)   How to declare a structure named "person" with members for name, age and address?

(3 marks)

(ii)   How do you define a nested structure named "Address" inside a structure named "Person"?

(3 marks)

(c)   Write a C++ program that uses a structure named "Book" to store the details of two books. The program prompts the user to enter the details of both books, including the title, author and book ID. Finally, the program displays the details of the two books on the console.

(10 marks)

– END OF QUESTIONS –

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