UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2022/2023

COURSE NAME : PRINCIPLES OF PROGRAMMING

COURSE CODE : DAT10603

PROGRAMME CODE : DAT

EXAMINATION DATE : JULY / AUGUST 2023

DURATION : 3 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 **SEVEN (7) PAGES**

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SECTION A (10 MARKS)

Answer **True** or **False** for each of the following questions.

Q1   The `string` class is not a build-in data type but is one of the classes in the C++ standard.

Q2   In the statement below, 10 occupies the first element of the array.
```
char number[5] = "10";
```

Q3   An array is not limited to the one-dimensional (1D) array; instead, it can have multiple dimensions.

Q4   When the statement below is executed, a null terminator (\0) is automatically appended to the string literal.
```
char name[10] = "Mr Bond";
```

Q5   A named constant with the `const` keyword does not need to be initialised during definition.

Q6   When an `if` statement is nested in another `if` statement, the only time the inner `if` is executed is when the expression of the outer `if` is false.

Q7   The initialisation statement of the loop's counter variable must come before the loop's Boolean expression.

Q8   In a nested loop, the inner loop goes through all its iterations for every single iteration of the outer loop.

Q9   When a function terminates, it always branches back to the `main` function, regardless of which function it was called from.

Q10   When you call an `ofstream` object's `open` member function, the specified file will be overwritten or erased if it already exists.

(10 marks)

SECTION B (40 MARKS)

Q11 Differentiate between procedural programming and object-oriented programming.

(2 marks)

Q12 There are three categories of computer languages. Describe each of the categories.

(6 marks)

Q13 Categorise the following into their appropriate character set.

(a) M

(1 mark)

(b) #

(1 mark)

(c) 1

(1 mark)

Q14 Identify the appropriate type of token for each of the tokens below.

(a) continue

(1 mark)

(b) "Never give up, no matter what."

(1 mark)

(c) studentName

(1 mark)

(d) >>

(1 mark)

(e) ;

(1 mark)

Q15 Suggest a suitable data type for the following literal constants.

(a) 98.9

(1 mark)

(b) "I compile my program with a compiler compatible with the ISO C++20 standard."

(1 mark)

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(c) 95

(1 mark)

(d) 'A'

(1 mark)

(e) "100"

(1 mark)

Q16 Determine whether the following variable name is valid or invalid.

(a) 2022sales

(1 mark)

(b) sales2022

(1 mark)

(c) _sales_2022

(1 mark)

(d) sales$2022

(1 mark)

(e) SALES_2022

(1 mark)

Q17 Identify the output of the program below.

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

int main() {
    double number1 = 4.91877, number2 = 456;

    cout << setprecision(3) << number1 << endl;
    cout << setprecision(4) << number2 << endl;

    cout << setprecision(3) << showpoint << number1 << endl;
    cout << setprecision(4) << showpoint << number2 << endl;

    cout << setprecision(3) << fixed << number1 << endl;
    cout << setprecision(4) << fixed << number2 << endl;

    return 0;
}
```

(6 marks)

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Q18 Given the incomplete program below.

```
// TODO: Q18 (a)
using namespace std;

int main() {
    string film;
    int year;

    cout << "Enter the name of a film: ";
    // TODO: Q18 (b) and Q18 (c)

    cout << "Enter the release year: ";
    cin >> year;

    cout << film << " was released in " << year << endl;

    return 0;
}
```

Based on the incomplete program:

(a) Write the preprocessor directive together with the header file(s) required.

(2 marks)

(b) Write a statement that reads a one-word film name.

(1 mark)

(c) Write a statement that reads a film name consisting of multiple words separated by spaces.

(1 mark)

Q19 Differentiate between the single-line and multi-line comments in terms of purpose and syntax.

(4 marks)

SECTION C (50 MARKS)

Q20 Write a separate program consisting of a single loop that calculates and displays each sequence of numbers below. When displaying, separate each number with a space.

(a) 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024
Hint: The next number is two times the current number.

(5 marks)

(b) 1, 4, 9, 16, 25, 36, 49, 64, 81, 100
Hint: Each number is a sequential square.

(5 marks)

Q21 Write a program to input the test score of 30 students and store it in the `score[30]` array of type `float`. The program should then display the highest, the lowest and the average scores.

(17 marks)

Q22 Write a program that calculates the number of bad calories in a recipe. Calories are considered bad when coming from fat and sugar. The program must have all the functions listed in **Table Q22**.

(23 marks)

– **END OF QUESTIONS** –

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Table Q22

Name	Purpose	Return Value
getWeight	• Accepts the ingredient name as its argument. The value of the argument should either be *fat* or *sugar*. • Then, asks the user for weight in kilograms. A prompt using the argument's value should be displayed before the cin object. • Input validation: Do not accept weight less than 0.	Fat or sugar weight
calcCaloriesFat	• Accepts the fat weight as its argument. • Then, calculates the amount of calories by multiplying the weight by 9.	Fat calories
calcCaloriesSugar	• Accepts the sugar weight as its argument. • Then, calculates the amount of calories by multiplying the weight by 4.	Sugar calories
main	• Calls the getWeight function twice to get the fat and sugar weights. • Then, calls the calcCaloriesFat and calcCaloriesSugar to calculate the fat and sugar calories. • Finally, calculates and displays the total of bad calories.	0

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