



**UNIVERSITI KUALA LUMPUR**  
**Malaysia France Institute**

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**FINAL EXAMINATION**  
**JULY 2010 SESSION**

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**SUBJECT CODE** : FSD 23002  
**SUBJECT TITLE** : PROGRAMMING FUNDAMENTAL  
**LEVEL** : DIPLOMA  
**TIME / DURATION** : 4.00pm – 6.00pm  
( 2 HOURS )  
**DATE** : 08 NOVEMBER 2010

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**INSTRUCTIONS TO CANDIDATES**

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1. Please read the instructions given in the question paper CAREFULLY.
  2. This question paper is printed on both sides of the paper.
  3. Please write your answers on the answer booklet provided.
  4. Answer should be written in blue or black ink except for sketching, graphic and illustration.
  5. This question paper consists of TWO (2) sections, Section A and B. Answer all questions in Section A. For Section B, answer two (2) questions only.
  6. Answer all questions in English.
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THERE ARE 9 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

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SECTION A (Total: 60 marks)

**SECTION A (Total: 60 marks)****INSTRUCTION: Answer all questions.****Please use the answer booklet provided.****Question 1**

Answer the following questions correctly.

- (a) State the function of software in a computer. (2 marks)
- (b) List down two (2) examples of programming language. (2 marks)
- (c) Define the term array. (2 marks)
- (d) State two differences between *do while* loop and *while* loop. (2 marks)

**Question 2**

Identify whether the C++ statement result below is TRUE or FALSE. Show the working process.

- (a) `char c1 = 'a', c2 = 'h';  
if( c1 == 'c' || !(c2 <= c1) )` (3 marks)
- (b) `int x = -2, y = 1, z = 3;  
if ( ( x / y && z / y - x ) || x > 0 )` (3 marks)
- (c) `float f = 5.2, g = 2.8, h = 4.1;  
if ( !(g / h) <= f || (h >= 4) )` (3 marks)
- (d) `if ( float( 7 / 4 ) <= !(float (7) / float (4)) )` (3 marks)

## Question 3

- (a) State the output that will be produced after the execution of the statement below.

```
float weight = 50.0;
cout<<"My weight: "<<weight<<"kg"
  <<" = "<< weight*2.2<<"lb"<<endl;
```

(2 marks)

- (b) Consider the following programmer-defined function declaration:

```
void dispMessage (void);
```

Determine the return data type and number of parameter list for function *dispMessage()*.

(2 marks)

- (c) Consider the following code:

```
int num = 10, total, z ;
for ( z = 5 ; z >= 1 ; --z) .
{
    total = num * z;
    cout << "\n total ="<<total;
}
```

- i. Determine the output after the execution.

(5 marks)

- ii. Modify the code by replacing *for* loop statement with *while* loop statement.

(2 marks)

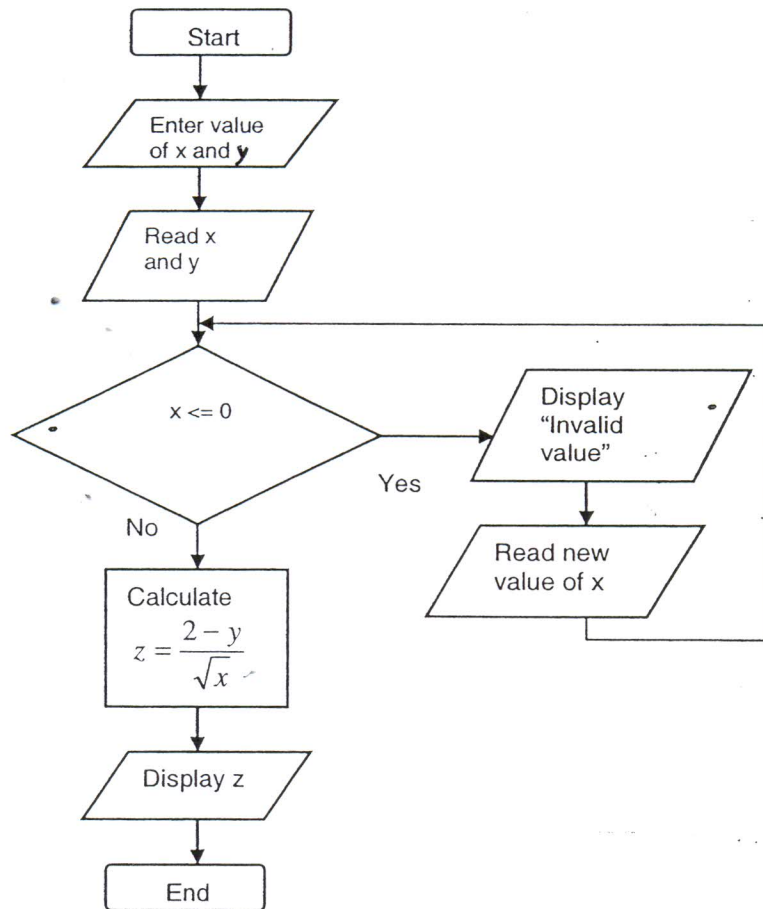
- (d) Consider the following code segment:

```
int j, addResistance = 150, addInductance = 10;
float resistance[2], inductance[2];
for( j = 2; j>=0 3; j--)
{
    resistance[j] = addResistance * j;
    inductance[j] = addInductance * j;
    cout<<"resistance #"<<j<<"= "<<resistance[j]<<"\n";
    cout<<"inductance #"<<j<<"= "<<inductance[j]<<"\n";
}
```

- i. Show the output displayed after the code is executed. (6 marks)
- ii. Determine the value that *resistance*[2] holds (2 marks)

**Question 4**

Consider the flowchart in **Figure 1**:



**Figure 1:** Flowchart for Question 4

- (a) Write a program based on the flowchart given in **Figure 1**. (Hint: use repetition statement to do the program) (12 marks)
- (b) Determine the output displayed if the value of x and y entered are 4 and 2 respectively. (4 marks)

**Question 5**

Below is a program in the main function that will calculate the multiplication of three (3) floating numbers entered by user. The programmer-defined function *Multi\_Num()* is used to calculate and display the multiplication of three (3) numbers entered by user. Write the complete function definition of *Multi\_Num()*.

```
#include <iostream>
using namespace std;
float Multi_Num(float x, float y , float z);
int main()
{
    float a, b, c, Tot_mul=0;
    cout<<"Enter 3 floating number :\n";
    cin>>a >> b >> c;
    Tot_mul= Multi_Num ( a , b , c ) ;
    cout<<"Total = "<<Tot_mul<<endl;
    return 0;
}
```

(5 marks)

## SECTION B (Total: 40 marks)

**INSTRUCTION:** Answer only TWO out of three questions.

Please use the answer booklet provided.

## Question 6

Nowadays, people are very concern with their health in which a person Body Mass Index (BMI) will reflects their conditions health. The usage of online BMI calculation is really good where people can know their BMI any time and any where. You are asked to write a program that able to calculate a person's BMI by using the following program flow:

- i. Display the option whether the weight and height entered will be in kilogram (kg) and meter (m) or pound (lb) and feet (ft);
- ii. Read the option of unit;
- iii. Read the weight and height value;
- iv. If the user selects to enter weight and height in pound (lb) and feet (ft), convert the value to kilogram (kg) and meter (m). The unit conversion is as below :

$$1ft = 0.305m$$

$$1lb = 0.454kg$$

- v. Calculate the BMI based on the formula below;

$$BMI = \frac{weight}{height^2}$$

- vi. Display the calculated BMI and appropriate message based on **Table 1**.

**Table 1:** Message will be displayed based on the calculated BMI

Body Mass Index (BMI)	Message Displayed
Less than 18.5	Underweight
18.5 – 24.0	Normal weight
24.0 – 28.5	Overweight
Grater than 28.5	Obese

Refer to **Figure 2** and **Figure 3** for the example of input output of the system.

```

C:\Dev-Cpp\Project1.exe
LET'S CALCULATE YOUR BMI
*****
1 - Weight (kg) Height(m)
2 - Weight (lb) Height(ft)

Enter your engineering unit to inserted:1

Weight : 55
Height : 1.65

Your status is -->BMI = 20.202
                NORMAL

Press any key to continue . . .
    
```

Figure 2: Example of printed input output when *kg* and *m* is selected

```

C:\Dev-Cpp\Project1.exe
LET'S CALCULATE YOUR BMI
*****
1 - Weight (kg) Height(m)
2 - Weight (lb) Height(ft)

Enter your engineering unit to inserted:2

Weight : 150
Height : 5.2

Your Weight and Height in kg and m
Weight = 68.1kg
Height = 1.586m

Your status is -->BMI = 27.0733
                OVERWEIGHT

Press any key to continue . . .
    
```

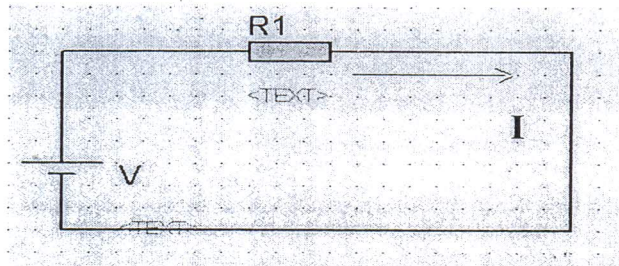
Figure 3: Example of printed input output when *lb* and *ft* is selected

(20 marks)

## Question 7

As a software engineer in the Yoko Electronics Company, you are required to develop software that able to calculate the current flow of five (5) different circuits developed by the company. **Figure 4** shows a single circuit designed by the company. The flow of the program will be as follows:

- i. Declare three (3) one-dimensional arrays named volts [5], resistance [5] and current [5];
- ii. Read values of voltage and resistance of the circuits and store in array volts[ i ] and resistance[ i ] respectively;
- iii. Divide each data in volts[ i ] and resistance[ i ] and store in the array current[ i ]. (Use:  $\text{current}[ i ] = \text{volts}[ i ] / \text{resistance}[ i ]$ );
- iv. Display the value of data in current[ i ] .



**Figure 4:** Circuit designed by the Yoko Electronics Company

Write a program that able to operate as explained in the above program flow. See **Figure 5** as the example of input output of the system. Use the repetition statements to construct the program.

```

C:\Dev-Cpp\Project1.exe
WELCOME TO YOKO ELECTRONIC CURRENT CALCULATION SYSTEM
*****
Enter UOLTAGE for 5 different circuit:
12 24 240 120 240
Enter RESISTANCE for 5 different circuit:
120 550 340 1500 100
-----
Current flow in each circuit is :
CURRENT FLOW for Circuit #1: 0.1
CURRENT FLOW for Circuit #2: 0.0436364
CURRENT FLOW for Circuit #3: 0.705882
CURRENT FLOW for Circuit #4: 0.08
CURRENT FLOW for Circuit #5: 2.4
Press any key to continue . . . _

```

**Figure 5:** Example of printed input output of the system.

(20 marks)



**Question 8**

In the world of engineering application, unit is very important in making a value meaningful. Write a program that will do the unit conversion from *millimeter (mm)* to *centimeter (cm)*, from *centimeter (cm)* to *meter (m)* and from *meter (m)* to *kilometer (km)*. Figure 3 shows the example of printed input output of a program that will prompt a user to enter the value to be converted in *millimeter (mm)* and the program will convert the entered value. Use the programmer-defined functions *mmToCm( )*, *cmToM( )* and *mToKm( )* to perform the conversions. The converted value will be displayed in the main function. Use the formula given to perform the conversion.

$$1cm = 10mm$$

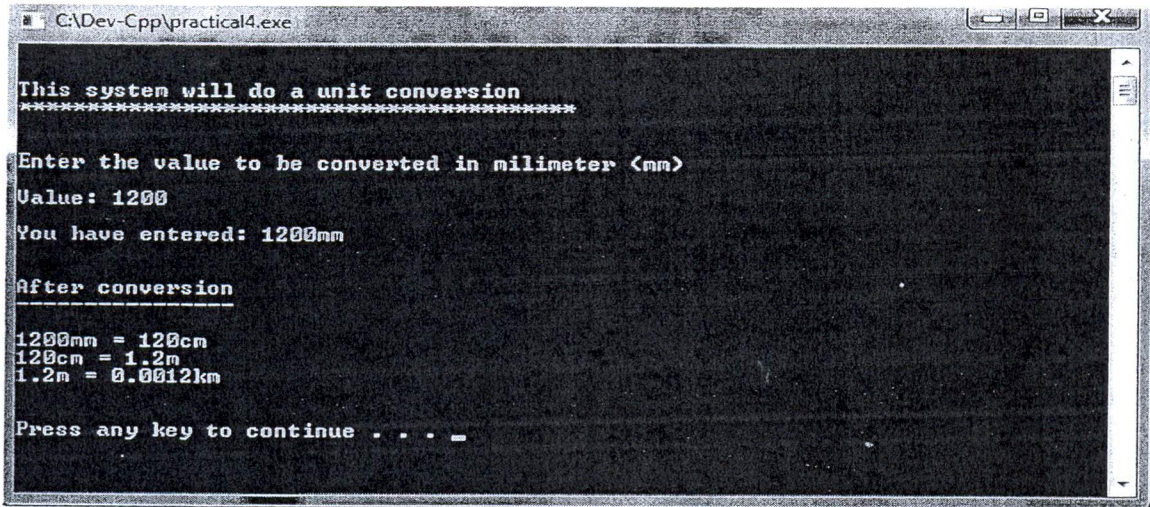
$$1cm = 100m$$

$$1m = 1000km$$

The three functions will work as follows:

- i. accept related parameters to perform the calculation;
- ii. return the converted value to the main function.

Refer to **Figure 6** for the example of printed input output.



```
C:\Dev-Cpp\practical4.exe
This system will do a unit conversion
*****
Enter the value to be converted in milimeter <mm>
Value: 1200
You have entered: 1200mm

After conversion
-----
1200mm = 120cm
120cm = 1.2m
1.2m = 0.0012km

Press any key to continue . . . _
```

Figure 6: Example of printed input output of the system

(20 marks)

END OF QUESTIONS