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CONFIDENTIAL

SET A

UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION
JANUARY 2010 SESSION

SUBJECT CODE	: FSD 23002
SUBJECT TITLE	: PROGRAMMING FUNDAMENTAL
LEVEL	: DIPLOMA
TIME / DURATION	: 9.00am – 11.00am (2 HOURS)
DATE	: 06 MAY 2010

INSTRUCTIONS TO CANDIDATES

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 questions paper consists of TWO (2) sections. Section A and B. Answer ALL questions in section A. For sections B, answer TWO (2) questions only.
6. Answer all questions in English.

THERE ARE 8 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

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) Define the term syntax in a 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)
```
int i = 5, j = 7;
      if( 3 * i - j < 22 )
```

(3 marks)

(b)
```
int x = 5, y = 2, z = 4;
   if ( ! ( x * y || z * y - x) )
```

(3 marks)

(c)
```
int a = 5, b = 2, c = 4;
if ( a % b * c > 5 || c % b * a < 7)
```

(3 marks)

(d)
```
if ( 2 * 3 != 4 / 5 && 0 )
```

(3 marks)

Question 3

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

```
float data = 58;
cout<<data<<"cm = "<<data/100<<"m"<<endl;
```

(2 marks)

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

```
float totalMoney (float debit, float credit);
```

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

(2 marks)

(c) Consider the following code:

```
int total = 1, x = 2,i = 1;
while ( i < 6)
{
   total *= x;
   cout << "\nTotal ="<<total;
   i++;
}
```

i. Determine the output after the execution.

(5 marks)

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

(2 marks)

(d) Consider the following statements:

```
int speed_v[4] = {20, 50, 90, 120};
```

Determine the value that *speed_v[3]* holds.

(2 marks)

Question 4

The following program is developed to solve a mathematical equation which is

$$y = \frac{1}{x}$$

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

int main()
{
   double numY, numX;

    cout<<"Please enter a number ";
    cin>>numX;


    while (numX < 0.0 || numX == 0.0)
    {
       cout <<"\nThe negative/zero number is"
            <<"invalid\n";
       cout <<"Enter a new number ";
       cin >>numX;
    }

    numY = 1/numX;

        cout<<"\n y =  "<<numY<<endl;
    }
   return 0;
}
```

(a) Draw a flowchart that represents the program.

(10 marks)

(b) State the output that will be displayed if the first and second number entered is -2 and 2 respectively.

(4 marks)

(c) Assume that the mathematical equation to be solve is

$$y = \frac{1}{\sqrt{x}}$$

Modify the statement **numY = 1/numX** line in the program so that it will be able to calculate the new mathematical equation. (*Hint: use a suitable function defined in cmath library*)

(2 marks)

Question 5

Write a C++ program that will store four (4) floating numbers entered by user and store them in an array named *newNUM[ ]* .

(6 marks)

Question 6

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

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

(5 marks)

SECTION B (Total: 40 marks)

INSTRUCTION: Answer only TWO out of three questions.
Please use the answer booklet provided.

Question 7

Write a program that will perform a calculation for a simple mathematical equation. There are two (2) options for user to select in solving the equations (refer to Table 1). The program will work as follows:

i. display the option that user has to select to start using the program;
ii. read related variables required to make calculation for selected mathematical expression;
iii. display the result on the screen;
iv. after each operation, ask whether user wants to continue with another operation or to end the session. Key in 'Y' to continue the program and 'N' to stop the program.

Figure 1 shows the example of printed input output of the program. The program should include the application of selection and repetition. Use a suitable library in solving the mathematical expression.

Table 1: Options and Mathematical expressions

Option	Mathematical Expression	Variables obtained from user
1	$y = x^n$	x , n
2	$y = x + 3x^n$	x , n

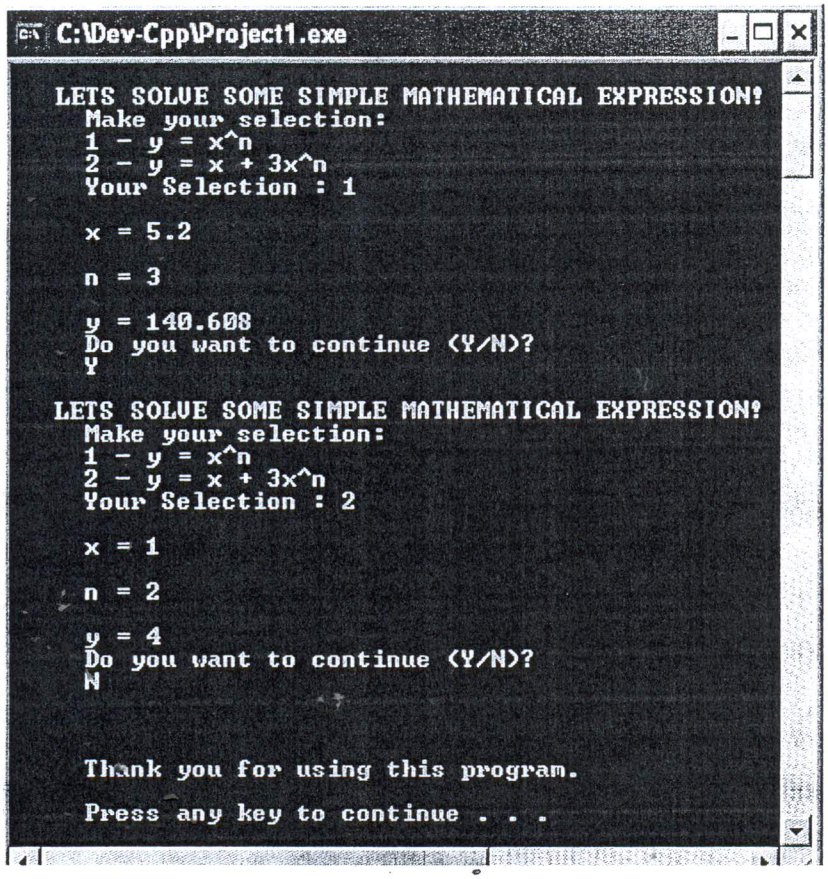

Figure 1: Example of printed input output

(20 marks)

Question 8

Write a program that will read four (4) temperatures in Celsius entered by user. Use the formula in given to do the conversion.

$$Fahrenheit = (9.0/5.0) * Celsius + 32.0$$

The program will work as follows:

i. read four (4) values of temperature from user;
ii. store these values in an array named *c[ ]*;
iii. convert the temperature using the given formula;
iv. store the converted temperature in a new array;
v. display the value in the new array named *new_F[ ]*;

Figure 2 shows the example of printed input output of the program.

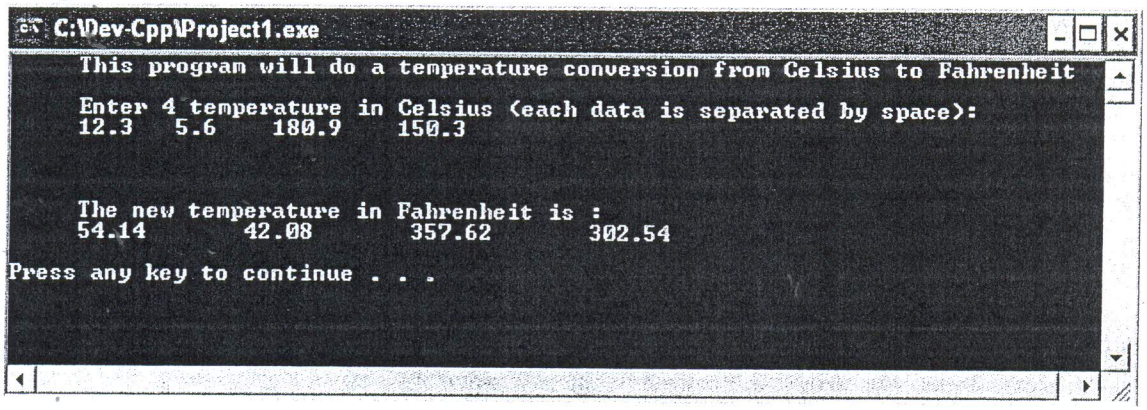

Figure 2: Example of printed input output

(20 marks)

Question 9

Develop a program that will calculate the area and the volume of a box. Figure 3 shows the example of printed input output of a program that will prompt a user to enter the value of width, length and height of a box. However, if one of the values entered is negative, ask the user to re-enter all the values for width, length and height. Use the programmer-defined functions *CalcArea( )* and *CalcVol( )* to perform the calculations. Calculated area and volume will be displayed in the main function. Use the formula given to write the program.

$$area = length * width$$

$$volume = lenght * width * height$$

Both functions will works as follows:

i. accept related parameters to perform the calculation;
ii. return the calculated area and volume to the main function.

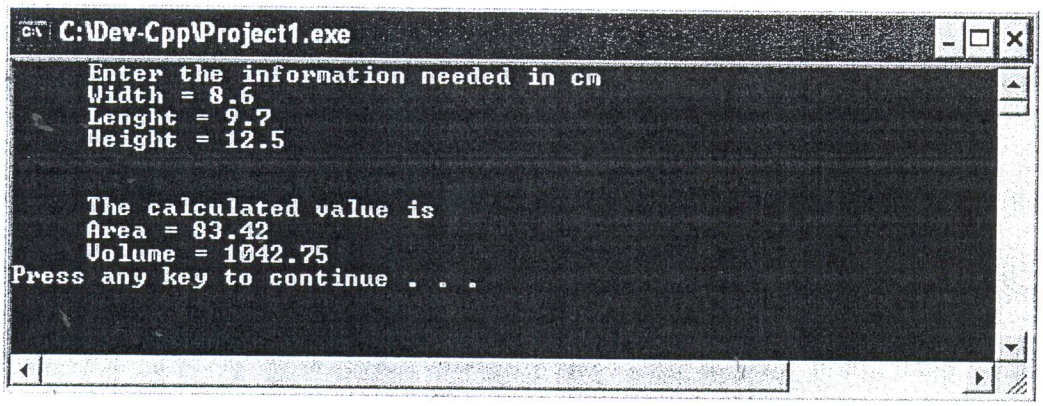

Figure 3: Example of printed input output

(20 marks)

END OF QUESTIONS