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CONFIDENTIAL

SET A

UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION

JANUARY 2014 SESSION

SUBJECT CODE	:	**FSD 23002**
SUBJECT TITLE	:	**PROGRAMMING FUNDAMENTAL**
LEVEL	:	**DIPLOMA**
TIME / DURATION	:	
		(2 HOURS)
DATE	:	

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 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.**

THERE ARE 9 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 60 marks)

INSTRUCTION: Answer all questions.
Please use the answer booklet provided.

Question 1

(a) Answer the following questions correctly.

(i) Define the term program.

(2 marks)

(ii) State two (2) methods to represent algorithm.

(2 marks)

(iii) Define the term syntax.

(2 marks)

(iv) Give two (2) type of programming language..

(2 marks)

(v) Define the term array.

(2 marks)

(b) Figure 1 is the memory overview of an integer array named `yrBorn [ ]`. Explain and state the array saiz, array offset number and array content of the array `grades[]`.

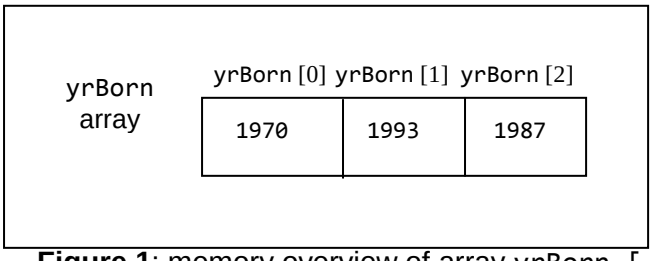


Figure 1: memory overview of array `yrBorn [ ]`

(4 marks)

(c) Let say you are asked to prepare a program that able to determine a whether a number entered by user is positive or negative. Outline the algorithm by sketching a flowchart to indicate the algorithm of the program.

(6 marks)

Question 2

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

```
int age = 20;
cout<<"Salam to"<<" all\n"
    <<"\tI am \n"<<age<<" years old"<<endl;
```

(2 marks)

(b) Write a C++ program that will declare and initialize a variable character *question* to the value of '? '. The program must be able to output the variable *question.*

(2 marks)

(c) Write a C++ statement that first prompts a user to key in and read two (2) decimal and store into the variables *float_1* and *float_2*. Your program must also display the difference of the integers. Assume that variable *mul*, *float_1* and *float_2* have been declared as float.

(6 marks)

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

```
int i, j = 3;

while (j > 0)
{ i = (1/2.0)+j;
  j--;
  cout<<j<<endl;}
```

(4 marks)

Question 3

(a) Consider the flowchart in Figure 2**.**

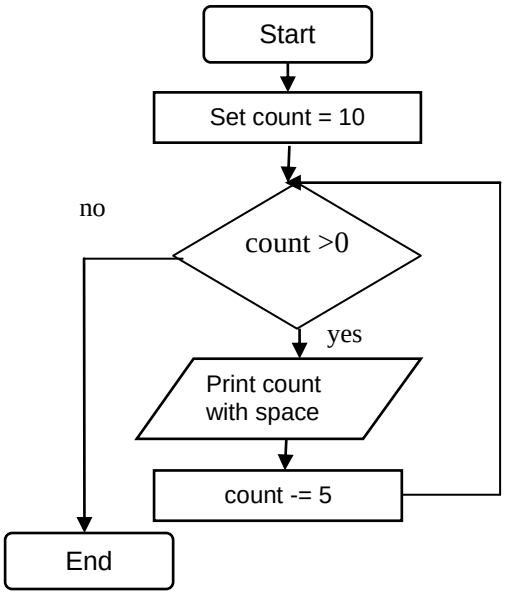


Figure 2: Flowchart to display value of variable *count*

(i) Using the repetition statements, write a C++ program of the above flowchart.

(5 marks)

(ii) Show the output display of the above repetition statement.

(2 marks)

(b) Consider the following code segment:

```
int myNum  [ ] = {20,6,-51,11,2,73};
for( int a = 5; a> 0; a--)
{
      cout<<myNum[a]<<" , ";
}
```

(i) Show the output displayed after the code is executed.

(5 marks)

(ii) Determine the value that *myNum[3]* holds.

(2 marks)

(c) Consider the following segment of program:

```
#include <iostream>
using namespace std;
int main()
{ float marks[5],i = 0;
cout<<"Please input 5 marks : "<<endl;

//complete the code

    return 0;
}
```

Using the *for* loop statement, complete the program above in which it able to read 5 numerical marks and store in an array *marks[ ]*.

(5 marks)

(d) A program below is used to calculate the average of two (2) numbers entered by user.

```
#include <iostream>
using namespace std;
float Ave_num(float x, float y);
int main()
{ float ave = 0, num1, num2;
cout<<"Please input 2 numbers : "<<endl;
cin>>num1>>num2;

//function call

cout<<"Average is "<<average<<endl;

    return 0;
}
//function definition
```

A programmer-defined function *Ave_num( )* is used to calculate the average and return the calculated average to the main function.

(i) Write the *function call* of the above code

(2 marks)

(ii) Write the *function definition* of *Ave_num( )*.

(5 marks)

SECTION B (Total: 40 marks)

INSTRUCTION: Answer TWO (2) questions only.
Please use the answer booklet provided.

Question 4

As a beginner in C++ program, you are asked to develop the simple calculator system to perform some mathematical operations. The system must work as follows:

i. Display the arithmetic option and its operation(refer to Table 1);
ii. Read the arithmetic option;
iii. Read two (2) numbers from user;
iv. Perform calculation and display the result;
v. Display “Invalid option” if the arithmetic option is not the system.

Table 1: Arithmetic option and its operation

ARITHMETIC OPTION	ARITHMETIC OPERATION
A	Addition
S	Subtraction
M	Multiplication
D	Division

(a) Assume that the problem above will use the *switch* statement, sketch a flowchart that will represent the above system.

(10 marks)

(b) Using the *switch* statement, write a complete C++ program based on the flowchart in Question 4 (a). The system must be able to accept either upper case letter or lower case letter as the arithmetic option. Refer to Figure 3 and Figure 4 as the input output example of the system.

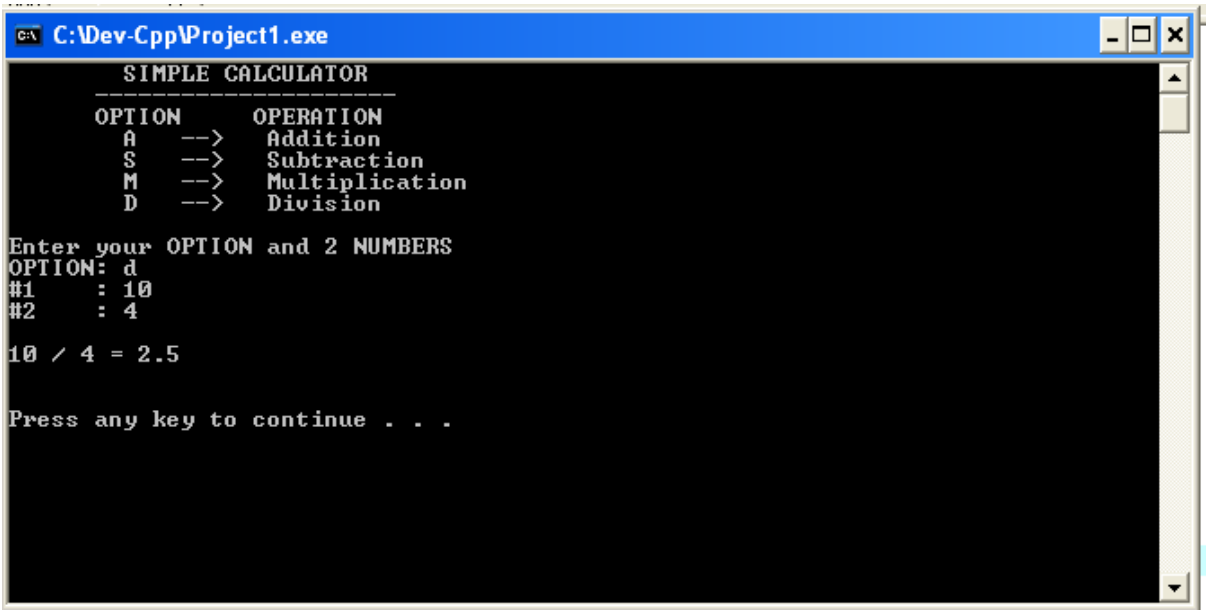


Figure 3: Sample of input and output of the system when option *d*, number *10* and *4* were entered.

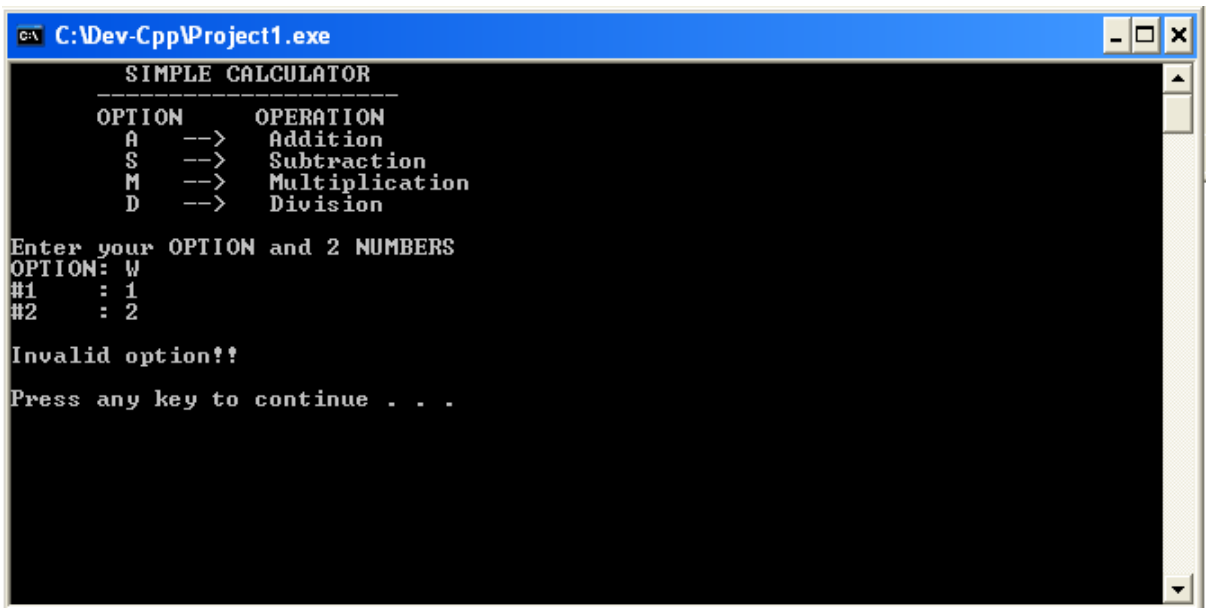


Figure 4: Sample of input and output of the system when option *W*, number *1* and *2* were entered.

(10 marks)

Question 5

(a) The angle of a circle can be determined in two (2) terms which are degrees and radians. The angle in degrees can be calculated using the following formula to obtain the degree in radians:

$$angle\ in\ rad = \frac{angle\ in\ deg}{180} \times \pi$$

Using this formula, you are asked to develop a system that able to calculate and display five (5) angles in radian from five (5) angles in degrees entered by user. The program will work as follows:

i. Read five (5) angles in degrees and store in an array named *angle_Deg[ ].*
ii. Calculate the angle in radian an store in an array named *angle_Rad[ ].*
iii. Display the content of both arrays.

Refer to Figure 5 for the example of input and output display of the program. Write a C++ program that will produce a system as explain above. Use the declaration of two (2) arrays *angle_Deg[ ]* and *angle_Rad[ ]* with the size of *5*.

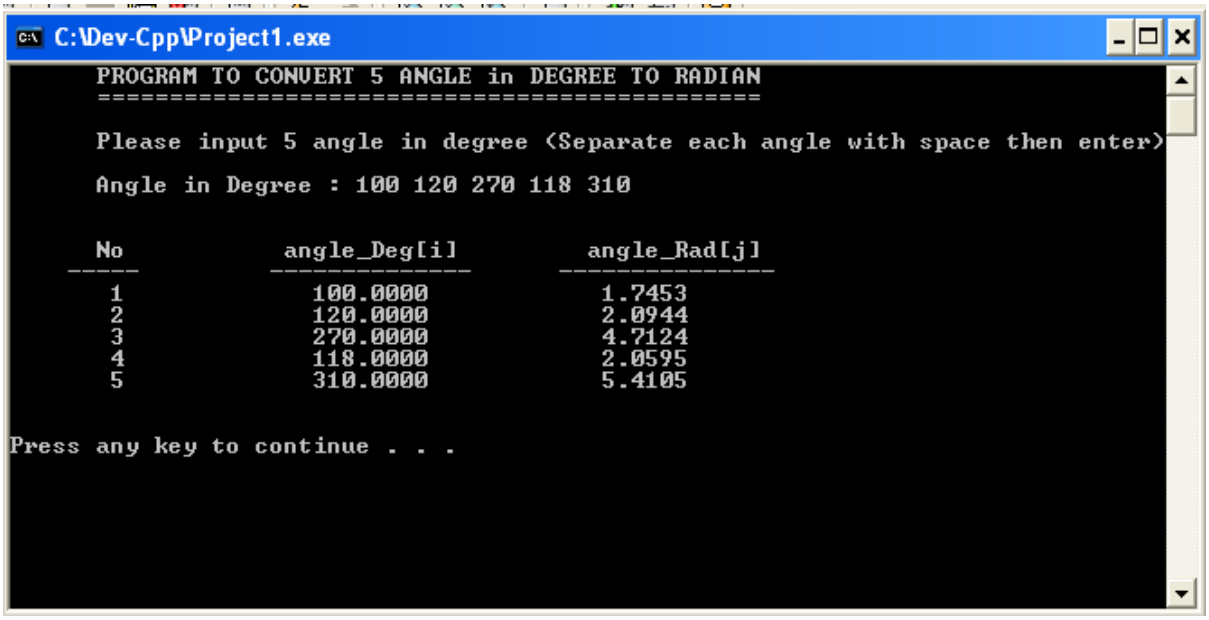


Figure 5: Sample of input and output of the system in converting 5 angle in degrees to radians.

(15 marks)

(b) Consider the program given below:

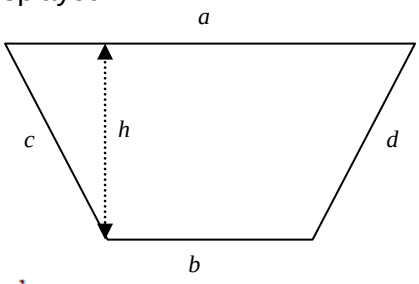
```
#include <iostream>
using namespace std;
int main( )
{
   int num = 5;

   if((num%2)!= 0)
   cout<<"Number is odd \n";
   else
   cout<<"Number is even\n";
   return 0;
}
```

Sketch the flowchart of the program above.

(5 marks)

Question 6

A program is developed to calculate the area and parameter of a trapezoid. The program will works in a way that user is required to input the value of *a*, *b*, *c*, *d* and *h* of a trapezoid. The perimeter and area will be calculated using the given formula in Figure 6. Then the calculated values will be displayed.



$$area = \frac{a+b}{2} \times h \qquad perimeter = a + b + c + d$$

Figure 6: Formula to calculate area and perimeter and area of a Trapezoid

(a) Write a simple program that able to calculate and display the perimeter and area of a trapezoid as explain above.

(5 marks)

(b) Let say that the above program need to be constructed using programmer-defined function. The details of the program are as follows:

(i) The main function will read the value of *a*, *b*, *c* and *d* of a trapezoid.

(ii) A programmer-defined function `calcPerimeter ( )`, will be used to calculate the perimeter of the box. The function will receive the value of *a*, *b*, *c* and *d*. The calculated perimeter value will be return to the main function.

(iii) A programmer-defined function `calcArea ( )`, will be used to calculate the area of the trapezoid. The function will receive the value of *a*, *b*, and *h*. The calculated area value will be return to the main function.

(iv) The main function will display the value of perimeter and area.

Develop the program from the above program's details.

(15 marks)

END OF QUESTIONS