INTI
INTERNATIONAL COLLEGE PENANG (507232-U)
LAUREATE INTERNATIONAL UNIVERSITIES

FINAL
Examination Paper

(COVER PAGE)

Session	:	APRIL 2014
Programme	:	DIPLOMA IN ELECTRICAL & ELECTRONIC ENGINEERING
Course	:	CSC1183 : PROGRAMMING IN C++
Date of Examination	:	24 JULY 2014
Time	:	11.00am – 1.00pm Reading Time : Nil
Duration	:	2 Hours
Special Instructions	:	

This paper consists of **SIX (6)** questions. Answer any **FOUR (4)** questions in the answer booklet provided. All questions carry equal marks.

Materials permitted :

Nil

Materials provided :

Nil

Examiner(s) : **Chern Huey Rong**

Moderator : **Dr. Vincent Khoo**

This paper consists of 7 printed pages, including the cover page.

DIPLOMA IN ENGINEERING

CSC1183: PROGRAMMING IN C++

FINAL EXAMINATION: APR 2014 SESSION

Instructions: This paper consists of **SIX (6)** questions. Answer any **FOUR (4)** questions in the answer booklet provided. All questions carry equal marks.

Question 1

(a) Write a program which the user inputs a numeric value. If the input is even, the program will display all the even numbers from 1 until the numeric value entered by the user. If the number is odd, the program will display all the odd numbers from 1 until the entered numeric value.

(6 marks)

b) Write a program that asks the user to type 2 integers A and B and exchange the value of A and B.

(5 marks)

(c) Write a program that asks the user to type 10 integers of an array. The program must compute and write the number of integers greater than or equal to 10.

(6 marks)

(d) A mail order house sells five different products whose retail prices are as follows:

product 1- $2.98
product 2 - $4.50
product 3 - $9.98
product 4 - $4.49
product 5 - $6.87

Write a program that reads a series of products which consist of:

a) Product number
b) Quantity sold for one day

Your program should use a **switch** statement to help determine the retail price for each product. Your program should calculate and display the total retail value of all products sold.

(8 marks)

Question 2

(a) Write a program that asks the user to enter **THREE (3)** numbers, then prints the smallest and the largest.

(5 marks)

(b) Request the user to type numbers (ex: n), each time printing its triple (ex: 3*n), until the user enters -999, which makes the end of the user inputs.

(5 marks)

(c) Assume an array:

```
a[10] = {1,2,3,4,5,6,7,8,9,10};
```

Write a program that contains a function **searchNumber** that accepts the array above and also a number which a user inputs to search for. If the number is found, the function should return the array index where the number was found. If the number is not found, then return -1. The main function should then print appropriate messages to indicate whether the number was found or was not found.

(10 marks)

(d) Write a program that contains a function that accepts a positive integer and prints all the divisors of a positive integer. The function should return no value.

(5 marks)

Question 3

(a) Write a program that helps an elementary school student learn multiplication. Use **rand** to produce two positive one-digit integers. It then should type a question such as

How much is 6 times 7?

The student then types the answer. Your program checks the student's answer. If it is correct, print **"Very good!"**, then ask another multiplication question. If the answer is wrong, print **"No. Please try again."**, then let the student try the same question repeatedly until the student finally gets it right.

(9 marks)

(b) Define a class Coord having two members type int as x and y. Use this class to define another class Rectangle which has two members of type Coord as UpperLeftCoord and BottomRightCoord. Define the constructors and member functions to get the length and breadth of a rectangle. Write a global function which creates an instance of the class Rectangle and computes the area using the member functions.

(12 marks)

(c) Is the following code correct? Justify your answer.

```
int intvar = 333;
int * intptr;
cout << *intptr;
```

(4 marks)

Question 4

(a) Write a complete C++ program to do the following.

(i) 'Student' is a base class, having two data members: entryno and name; entryno is integer and name of 20 characters long. The value of entryno is 1 for Science student and 2 for Arts student, otherwise it is an error.

(ii) 'Science' and 'Arts' are two derived classes, having respectively data items marks for Physics, Chemistry, Mathematics and marks for English, History, Economics.

(iii) Read appropriate data from the screen for 3 science and 2 arts students.

(iv) Display entryno, name, marks for science students first and then for arts students.

(15 marks)

(b) What is the output of following programs:

(i)

```
#include<iostream.h>
int global = 10;

void func(int & x, int y)
{
        x = x – y;
        y = x * 10;
        cout<<x<<"\t"<< y<< "\n";
}
void main()
{
        int global = 7;

        func(::global, global);
        cout<<global<<"\t"<<::global<<"\n";

        func(global,::global);
        cout<<global<<"\t"<<::global<<"\n";
}
```

(ii)

```
#include<iostream.h>
void main( )
{
        int i, j, m;
        int a[5]={8, 10, 1, 14, 16};

        i = ++a[2];
        m = a[i++];
        cout <<i<<m;
}
```

(10 marks)

Question 5

(a) How do the properties of the following two derived classes differ?
(i) class X : public A{//..}
(ii) class Y : private A{//..}

(6 marks)

(b) What are the two methods of opening a file? Explain with examples. What is the difference between the two methods?

(10 marks)

(c) Write a program to get a number from user. Use this as first number to generate Hailstone sequence. Display the total count of numbers in this Hailstone sequence.

Hailstone sequence is a sequence of numbers that will eventually end in one by following a simple rule; if the number is even, halve it by two, if it's odd, times it by three and add one (e.g., starting with the number 5 the sequence would be 5, 16, 8, 4, 2, 1
starting with the number 21 the sequence would be 21, 64, 32, 16, 8, 4, 2, 1).

(9 marks)

Question 6

(a) What is multiple inheritance? Discuss the syntax and rules of multiple inheritance in C++. How can you pass parameters to the constructors of base classes in multiple inheritance? Explain with a suitable example.

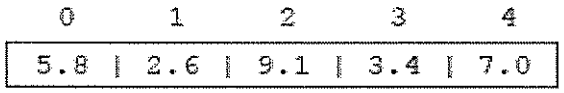
(12 marks)

(b) Write a function named **"rotate_right"** that takes as its arguments the following:

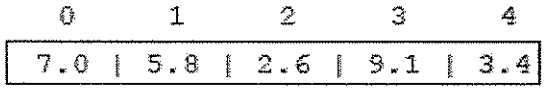
(i) an array of floating point values;

(ii) an integer that tells the number of cells in the array;

The function should shift the contents of each cell one place to the right, except for the contents of the last cell, which should be moved into the cell with subscript 0. Thus, for example, if the array passed to the function looks like this:



then when the function returns, the array will have been changed so that it looks like this:



The function should not return a value.

(6 marks)

(c) Identify and explain user defined data types in C++.

(7 marks)

--THE END--