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

FINAL Examination Paper

(COVER PAGE)

Session	:	*APR 2013*
Programme	:	DIPLOMA IN ELECTRICAL AND ELECTRONIC ENGINEERING
Course	:	**CSC1183: PROGRAMMING IN C++**
Date of Examination	:	29 July 2013
Time	:	8a.m. – 10a.m. 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 :

Examiner(s)	:	Chern Huey Rong
Moderator	:	Dr. Sukumar Letchmunan

This paper consists of 8 printed pages, including the cover page.

INTI INTERNATIONAL COLLEGE PENANG

DIPLOMA IN ENGINEERING
CSC1183: PROGRAMMING IN C++

FINAL EXAMINATION: APR 2013 SESSION

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Question 1

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

(6 marks)

(b) What does the following program print?

```
#include <iostream>

using std::cout;
using std::endl;

int main()
{
   int y, x = 1, total = 0;

   while ( x <= 10 ) {
           y = x * x;

           cout << y << endl;

           total += y;
          ++x;
   }

   cout << "Total is " << total << endl;
   return 0;
}
```

(6 marks)

(c) Using a **for** loop, write a program to print the following series:

20,15,10,5

(5 marks)

(d) Read in a sequence of numbers and print them out in reverse. Do not use any functions for this problem. You will have to use an array to store the numbers.

(5 marks)

(e) Translate this switch statement into equivalent **if** statements.

```
switch (xx) {
      case 1: cout << "Hello";
              break;
      case 3: cout << "Goodbye";
              break;
      default: cout << "Never mind,";
}
```

(3 marks)

Question 2

(a) Write a program to ask the user to enter two integers. Determine and print the larger number followed by the words "**is larger**." If the numbers are equal, print the message "**These numbers are equal**.".

(5 marks)

(b) Identify and correct the error(s) in each of the following:

(i)
```
 if ( age >= 65 );
  cout << "Age is greater than or equal to 65" << endl;
else
  cout << "Age is less than 65" << endl;
```

(ii)
```
if ( age >= 65 )
  cout << "Age is greater than or equal to 65" << endl;
else;
  cout << "Age is less than 65" << endl;
```

(iii)
```
int x = 1, total;
while ( x <= 10 ) {
  total += x;
  ++x;
}
```

(iv)
```
while ( x <= 100 )
  total += x;
++x;
```

(v)
```
while ( y > 0 ) {
  cout << y << endl;
  ++y;
}
```

(5 marks)

(c) Request the user to type numbers (ex: n), each time printing its triple (ex: 3*n), until the user enters -999.

(5 marks)

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

(5 marks)

(e) 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) The *factorial* function is used frequently in probability problems. The factorial of a positive integer n (written $n!$ and pronounced "n factorial") is equal to the product of the positive integers from 1 to n. Write a program that evaluates the factorials of the integers from 1 to 5. Print the results in tabular format.

(6 marks)

(b) Write a program that reads in the 2 sides of a rectangle. Print the perimeter and area of the rectangle. Display these calculations in output statements. If a user enters a negative number, which is invalid, the program should prompt the user to re-enter.

(8 marks)

(c) Class Y has been derived from class X. The class Y does not contain any data members of its own. Does the class Y require constructor. If yes, why?

(4 marks)

(d) Write a program to reverse an integer using recursion technique.
Ex: reverse of 1234 is 4321

(7 marks)

Question 4

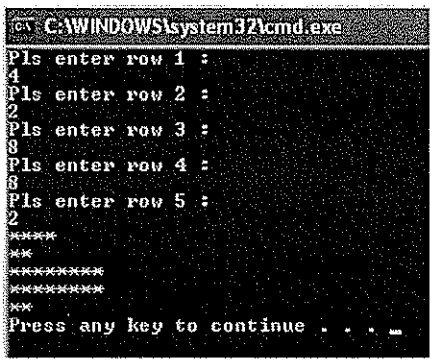
(a) Assume an array:

```
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.

(9 marks)

(b) One interesting application of computers is the drawing of graphs and bar charts. Write a program as shown below that reads five numbers (each between 1 and 30). For each number read, your program should print a line containing that number of adjacent asterisks. For example, if your program reads the number seven, it should print *******.



(7 marks)

(c) Write a program in which a class has three data members: name, roll no, marks of 5 subjects and a member function Assign() to assign the streams on the basis of table given below:

Avg. Marks	Stream
90% or more	Computers
80% - 89%	Electronics
75% - 79%	Mechanical
70% - 74%	Electrical

(9 marks)

Question 5

(a) Brieftly explain what is inheritance and give a simple example to illustrate it.

(5 marks)

(b) The Fibonacci series

0, 1, 1, 2, 3, 5, 8, 13, 21, ...

begins with the terms 0 and 1 and has the property that each succeeding term is the sum of the two preceding terms.

Write a recursive function fibonacci(n) that calculates the nth Fibonacci of term n.

(7 marks)

(c) Why is so much attention today focused on object-oriented programming in general and C++ in particular?

(6 marks)

(d) Write a program to read the following a file called "clients.dat" and only print out the names of those people whose age is above 30:

John	34
Albert	19
Mike	44
David	20
Clark	50

(7 marks)

Question 6

(a) (i) Create a class called **GradeBook** that has a public member function called **displayMessage()** that displays a message "Welcome to the GradeBook".

(2 marks)

(ii) Write a main function that instantiates a **GradeBook** object called **myGradeBook**.

(2 marks)

(iii) Within the main function above, call the **displayMessage()** function of **myGradeBook** object.

(2 marks)

(iv) Modify the **displayMessage()** function so that it will receive a string called **courseName**. It will then display the message "Welcome to the Gradebook for " followed by the courseName.

(2 marks)

(v) Within the main function, write program statements that will prompt the user to enter the name of the course, which will then be saved in the variable **courseName** by calling the **displayMessage**

(2 marks)

(b) Write a program that can input some data and save it to a file called "**clients.dat**". A sample output is shown below:

```
Enter the account, name, and balance.
 Enter end-of-file to end input.
 ? 100 Jones 24.98
 ? 200 Doe 345.67
 ? 300 White 0.00
 ? 400 Stone -42.16
 ? 500 Rich 224.62
 ? ^Z
```

(7 marks)

(c) (i) What happens in a while loop if the control condition is false initially?

(2 marks)

(ii) What is wrong with the following loop

```
while (n <= 100)
Sum += n*n;
```

(2 marks)

(iii)What is wrong with the following program

```
int main( )
{
      const double PI;
      int n;
      PI = 3.14159265358979;
      n = 22;
}
```

(2 marks)

(iv) How many constructors can a class have, and how should they be distinguished.

(2 marks)

--THE END—