INTI
International College Penang
LAUREATE INTERNATIONAL UNIVERSITIES*

FINAL
Examination Paper

(COVER PAGE)

Session	:	**January 2016**
Programme	:	Diploma in Electrical and Electronic Engineering (DEEI)
Course	:	**CSC2181: Object-Oriented Programming**
Date of Examination	:	8 March 2016 (Tuesday)
Time	:	8.00am – 10.00am
Duration	:	2 Hours Reading Time : Nil
Special Instructions	:	

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

IMPORTANT NOTE : THIS PAPER SHOULD NOT BE TAKEN OUT OF THE EXAMINATION HALL

Materials Permitted :

Nil

Materials Provided :

Answer Booklet

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

Moderator : Dr. Vincent Khoo

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

INTI INTERNATIONAL COLLEGE PENANG

DIPLOMA IN ELECTRICAL AND ELECTRONIC ENGINEERING
CSC2181: OBJECT-ORIENTED PROGRAMMING
FINAL EXAMINATION: JANUARY 2016 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) Code an example of **method overriding**.

(6 marks)

(b) Show a code example of the use of **abstract class**.

(5 marks)

(c) Appointment myAppointment = new Appointment(9.30, "Wednesday", "Block A");

Write the most appropriate constructor for Class Appointment

(6 marks)

(d)

```
public class Packet {
        private int SourceAddress;
        private int DestinationAddress;
        private int Status;
        private int Command;
}
```

Complete the code so the user can update and retrieve the values inside.

(8 marks)

Question 2

(a) Print the integers from 1 to 20, using a **while** loop and the counter variable i. Assume that the variable i has been declared, but not initialized. Print only five integers per line. Repeat the above, using a **for** statement.

(10 marks)

(b) Give the method header for each of the following methods:

i) .Method hypotenuse, which takes two double-precision, floating-point arguments side1 and side2 and returns a double-precision, floating-point result.

ii) Method smallest, which takes three integers x, y and z and returns an integer.

iii) Method instructions, which does not take any arguments and does not return a value. [Note: Such methods are commonly used to display instructions to a user.]

iv) Method intToFloat, which takes an integer argument number and returns a floatingpoint result.

(8 marks)

(c)

```
public class Human {
        private String Name;
        private int Age;
}
public class Warrior extends Human {
        private String Weapon;
        private String Armor;
}
```

Define the constructors of class Warrior and class Human with full code declaration.

(7 marks)

Question 3

(a) Write a program that prompts for and reads a power of 10 (e.g. 6, 9, 10, ...). It should then display how big the number is in English (e.g. in Million, Billion, etc.). Display an appropriate message for the input value that has no corresponding word. Here are some output examples:
10 raised to the 6th power is a million.
10 raised to the 12th power is a trillion.
There is no single word for 10 raised to the 10th power.
The table below shows the correspondence between the power of 10 and the word representing the number.

Power of 10	Number
6	Million
9	Billion
12	Trillion
15	Quadrillion
18	Quintillion
21	Sextillion
30	Nonillion
100	Googol

Any input value not listed in the table should be handled as one that has no corresponding word. **You MUST USE the switch statement.**

(12 marks)

(b) Information hiding is one feature of object oriented programming. Show an example code on how you will hide an attribute and a method in Java.

(4 marks)

(c) A series of number is defined as:

1 2 3 5 8 13 21 34 55 89

Write a **recursive** method to display all the elements in the list above.

(9 marks)

Question 4

(a) Write an application that calculates the product of the odd integers from 1 to 15 and displays the results.

(5 marks)

(b) Define a class called Triangle with three integer data members a, b, and c as the lengths of its three edges. This class should have the following methods:

(i) a constructor with 3 parameters representing the 3 edges
(ii) a method isTriangle() which returns true if the 3 edges are all positive and they satisfy the triangle inequality where a+b > c, a+c > b, b+c > a.
(iii) a method getAngle() with 1 parameter, an edge, which returns the angle in degrees of the angle facing the given edge.

The signature of these methods are given below:

public Triangle(int newa, int newb, int newc)
public boolean isTriangle()
public double getAngle(int edge)

Note: getAngle() should return zero if the triangle is not really a triangle.

FYI, if A is the angle facing side a, then the following formula should help:

$$cosA = \frac{b^2 + c^2 - a^2}{2bc}$$

(20 marks)

Question 5

(a) Perform the following tasks for an array called table:

i) Declare and create the array as an integer array that has three rows and three columns. Assume that the constant ARRAY_SIZE has been declared to be 3.
ii) How many elements does the array contain?
iii) Use a **for** statement to initialize each element of the array to the sum of its indices. Assume that the integer variables x and y are declared as control variables.

(10 marks)

(b) int a[ ]= {4, 5, 70, 61, 12, 2, 3, 11, 9, 10};

Implement a bubble sort on the array and display the second largest number.

(8 marks)

(c) Write a complete program to calculate the frequency of 1 and 0 from your input. If your input is 11110000, then the program will display four 1s and four 0s. Use **if else** statement to implement the calculation.

(7 marks)

Question 6

(a) Explain the purpose of a method parameter. What is the difference between a parameter and an argument?

(8 marks)

(b) What is the difference between a local variable and a field?

(8 marks)

(c) Write a complete Java application to prompt the user for the double radius of a sphere, and call method sphereVolume to calculate and display the volume of the sphere. Use the following statement to calculate the volume:
double volume = (4.0 / 3.0) * Math.PI * Math.pow(radius, 3)

(9 marks)

--THE END—

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