INTI
International College Penang
LAUREATE INTERNATIONAL UNIVERSITIES

FINAL
Examination Paper

(COVER PAGE)

Session : **August 2015**

Programme : Diploma In Electrical And Electronic Engineering (DEEI)

Course : **CSC2181: Object-Oriented Programming In Java**

Date of Examination : 10th December 2015 (Thursday)

Time : 8:00 am – 10:00 am

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 : Nil

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 (DEEI)
CSC2181: OBJECT-ORIENTED PROGRAMMING IN JAVA
FINAL EXAMINATION: AUGUST 2015 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 snippets of codes to print the integers from 1 to 20, using a while loop and the counter variable j. Assume that variable j has been declared, but not initialized. Print only five integers per line. Use the System.out.println() method to output the newline character and use the System.out.print ('\t') to print the tab character.

(7 marks)

(b) A human has a name, age and gender while a worker has a name, age, gender, position and salary. Transform these facts into Java codes that show the concept of inheritance.

(8 marks)

(c)

```
public class Human {
      private String Name;
      private int Age;

      public Human(String Name, int Age) {
            this.Name = Name;
            this.Age = Age
      }
}

public class Office {
      public static void main(String args[ ]) {
            Human a = new Human( );
      }
}
```

Identify the error in the Java code above. Modify the code to fix the error.

(4 marks)

(d) Declare a class Student that contains the attributes **name, studentId** and **studentCounter.** Each time a new object is created based on the Student, the studentCounter is increased by 1 and the value is assigned to the studentId.
Given this information, declare class Student, showing its attributes plus constructor only.

(6 marks)

Question 2

(a) Bubble sort. Array **list** is going to be sorted using bubble sort. The bubble sort is given as follows: (Assume all relevant declarations have been made)

```
int [] list = {25, 45,  17,  65,  33,  55,  12,   18};
boolean needNextPass = true;
int temp;

for (int k = 1; k < 8; k++)
{
    needNextPass = false;
    for (int i = 0; i < 8 - k; i++)
    {
         if (list[i] > list[i + 1])
         {
            temp = list[i];
            list[i] = list[i + 1];
            list[i + 1] = temp;
            needNextPass = true;
         }
    }
    System.out.print("\npass done for now: ");
    for (int i = 0; i < 8 ; i++)
         System.out.print(list[i]+ " ");
}
```

Write the contents of this array after the FIRST THREE repetitions.

(12 marks)

(b) Why should you use the keyword **super** in your java program? Explain with an example.

(9 marks)

(c) Explain and give an example code on the use of **mutator** method.

(4 marks)

Question 3

(a) The Greatest Common Divisor (GCD) of two whole numbers is the largest whole-number that's a divisor (factor) for both of them. For instance, the largest number that divides both 20 and 16 is 4. Write a complete program to read in two integers and compute their GCD – Greatest Common Divisor.

(11 marks)

(b)

```
switch (n) {
    case 1:
        update( );

    case 2:
        delete( );

    case 3:
        retrieve( );
        break;

    case 4:
        cancel( );
        break;
}
```

Convert this switch case statement into an if-else statement.

(6 marks)

(c) Write a program in Java that prints the following output on the screen:

0 0 0 0 0
0 0 1 2 3
0 1 3 5 7
0 2 5 8 11

(8 marks)

Question 4

(a) For this question you are provided with the class `Student` that has at least three methods available to you. `getScore()` returns the student's score. `isTalkative()` returns true if the student is talkative in class, false otherwise. The signature of these methods are given below:

```
public int getScore()
public boolean isTalkative()
```

Note that the class may have more data members or methods that are not reflected here. You are asked to write a method `printGrade` with the following signature:

```
void printGrade(Student s1);
```

As the name suggests, this method takes an object of type **`Student`** and prints out the final grade for that student. The grade is assigned using the following guidelines.

i. There are only 3 possible grades A or B.
ii. If a student has a score of more than or equal to 75, is assigned an A.
iii. If a student has a score of less than 75, is assigned a B.
iv. Students who scores exactly 75 receive an B only if they are talkative in class, and an A otherwise.

(7 marks)

(b) Design a class named Student that has two private data – student id and score. The class should contain a parameterized constructor to initialize its data member and one method to display the information. Now write a Java program that will use an array of Student objects to represent information about 3 students. Your program should take input from the keyboard and display the information of the 3 students.

(12 marks)

(c) Consider the following (recursive) static method.

```
public static char mystery(String s, int n, int m)
{
        if (n == 1) return s.charAt(m);
        char first = mystery(s, n / 2, m + 3);
        char second = mystery(s, n / 2, m * 2);
        System.out.print(first + " " + second + " ");
        return first;
}
```

What is printed when this method is called with
mystery("ObjectOrientedProgramming", 5, 1); ?

(6 marks)

Question 5

(a) What are the possible contents of an interface? State the THREE advantages of using an interface.

(10 marks)

(b) What is early binding, late binding and dynamic binding?

(6 marks)

(c) A student can register for 2 subjects or 3 subjects per semester. Use method overloading to display this concept.

(5 marks)

(d)

```
public class Program {

      public static void main(String args[ ]) {
            Greeting( );
      }

      public void Greeting( ) {
            System.out.println("Hi");
      }

}
```

This code contains an error. Identify the error and fix it.

(4 marks)

Question 6

(a) Is the **switch** statement more efficient than the **if** statement? Why?

(7 marks)

(b) Write down the output of the following sequence of code:

```
for (int I = 0; I < 8; I++) {
    for (int J = 4 - (I % 4); J > 0; J--)
        System.out.print("");
    for (int J = 0; J < (I % 4) + 1; J++)
        System.out.print("X");
    System.out.println();
}
```

(8 marks)

(c) List FIVE differences between constructor and method in java.

(10 marks)

--THE END—

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