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

FINAL Examination Paper

Session	:	*JAN 2013*
Programme	:	**DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING**
Course	:	**CSC2181: OBJECT-ORIENTED PROGRAMMING IN JAVA**
Date of Examination	:	4 March 2013
Time	:	11a.m. – 1p.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	:	Lim Chai Kim

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

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DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

CSC2181: OBJECT-ORIENTED PROGRAMMING IN JAVA
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Question 1

(a) A Feline has a name, age, color and breed.

From the information above, declare the class Feline, its attributes and the constructor for class Feline.

(5 marks)

(b) What are the differences between the constants 7, '7' and "7"?

(5 marks)

(c) Write statement(s) that accomplish each of the following tasks:

i. Create a Scanner that reads values from the standard input.
ii. Declare the variables **x**, **y**, **z** and **result** to be of type int.
iii. Prompt the user to enter the first integer.
iv. Read the first integer from the user and store it in the variable **x**.
v. Compute the product of the three integers contained in variables **x**, **y** and **z**, and assign the result to the variable **result**.

(5 marks)

(d)
```
5
5 4
5 4 3
5 4 3 2
5 4 3 2 1
```

Use a **for** loop to display the pattern above.

(5 marks)

(e) Explain with code example on what is an object in Java.

(5 marks)

Question 2

(a) Given the following class definitions

```
public class ClassP
{
      public String printInfo()
      { return "This is ClassP;"; }
      public String printAll()
      { return "In ClassP: " + printInfo(); }
}

public class ClassQ extends ClassP
{
      public String printInfo()
      { return "This is ClassQ;"; }
      public String printAll()
      { return "In ClassQ: " + printInfo() + " and: " +
      super.printAll(); }
}

public class TestPQ
{
      public static void main(String [] args)
      {
            ClassP myP = new ClassP();
            ClassP myQ = new ClassQ();
            System.out.println("myP: " + myP.printAll());
            System.out.println("myQ: " + myQ.printAll());
      }
}
```

what will be displayed on standard output as a result of running `TestPQ`?

(5 marks)

(b) The user inputs a numeric value. If the input is even, the program will display all the even number between 1 and the input. If the number is odd, the program will display all the odd numbers between 1 and the input.

(5 marks)

(c) Explain with example the use of **mutator** method.

(5 marks)

(d) Find the error in each of the following program segments. Explain how to correct the error.

i.

```
int g()
{
        System.out.println( "Inside method g" );
              int h()
              {
                    System.out.println( "Inside method h" );
              }
}
```

ii.

```
int sum( int x, int y )
{
        int result;
        result = x + y;
}
```

iii.

```
void f( float a );
{
        float a;
        System.out.println( a );
}
```

iv.

```
void product()
{
        int a = 6, b = 5, c = 4, result;
        result = a * b * c;
        System.out.printf( "Result is %d\n", result );
        return result;
}
```

(5 marks)

(e) 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.

(5 marks)

Question 3

(a)

```
public class Engineer extends Human {
      private float Salary;

      public Engineer(String Name, int Age, float Salary) {
            super(Name, Age);
            this.Salary = Salary;
      }
}
```

Explain what the super command does, and write a possible declaration for class Human.

(5 marks)

(b)

```
public interface Movement {
      public void swim();
      public void run();
}

public class Fish implements Movement {

}
```

Write a possible implementation of method swim( ) in class Fish. Then ensure the class Fish can be compiled without error.

(5 marks)

(c) Consider the following Java program:

```
public class Main {
      public static void main(String[] args) {
            int i, j, k, a[];
            a = new int[5];
            for (k = 0; k < 5; k++) a[k] = 1;
            for (i = 1; i < 4; i++)
                  for (j = i; j > 0; j--)
                        a[j] += a[j-1];
      }
}
```

List the initial contents of the array **a** (after the first loop) and then list the contents of it after each iteration (for each value of **i**) of the loop containing **i**. Modify the program so that it displays the contents of **a** after each iteration of the loop containing i.

(7 marks)

(d) Explain why you must be careful when passing objects to a method or returning objects from a method.

(3 marks)

(e) Implement a Java method that calculates the sum of digits for a given char array consisting of the digits '0' to '9'. The function should return the digit sum as a long value. Hint: you can do arithmetic with char-values like int-values in Java: the character's unicode is treated as an int-value. The digits '0' to '9' have a consecutive binary encoding without gaps. The expression '1' == '0' + 1, for instance, is true.

(5 marks)

Question 4

(a) Show an example of a default constructor.
In what situation do we need to declare the default constructor?

(5 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.

(5 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.

(5 marks)

(d) How does Java make platform independence possible?

(4 marks)

(e) Given a bag that contains 10 balls each labeled 0,1,2,3,4,5,6,7,8,9. If 3 balls were to be taken from the bag, write a program to display all the possible combinations of numbers and indicate total number of combinations.

(6 marks)

Question 5

(a) Provide answers for short questions below and explain your answer.

i. Can an Interface implement another Interface?
ii. Can a Class extend more than one Class?
iii. Can a method be overloaded based on different return type but same argument type?
iv. Can you call one constructor from another if a class has multiple constructors?
v. Is it possible to partially implement an interface?

(10 marks)

(b) When do we use **.length** versus **.length( )**? Write Java codes to show the difference.

(5 marks)

(c) A student creates an object based on a Java class. He instantiate the values to the object but when he displays the value, it shows null and 0.

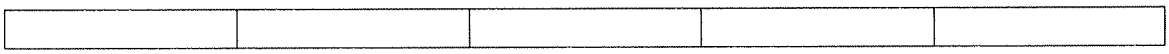
The constructor of the class is as shown below:

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

Explain what is wrong and how do we solve the problem.

(5 marks)

(d)



Assume you have a robot walking to and fro in these cells. If the robot reaches the end wall, it will turn the other way around. A boolean variable WalkRight = true is assumed to make the robot move to the right.

Assume the cell is an array of size 5.

int a[ ] = new int[5];

Write a piece of code to detect if the robot has reached a wall and turn it. Assume the robot can move both ways.

(5 marks)

Question 6

(a) Identify and explain **THREE (3)** differences between abstract class and interface.

(6 marks)

(b) **class Dog**

```
public class Dog {
    public final void Greeting( ) {
        System.out.println("Woof" );
    }
}
```

class Poodle

```
public class Poodle extends Dog {
    public void Greeting( ) {
        System.out.println("Grrr" );
    }
}
```

There is an error in this method overriding. Identify and explain the cause of the error. Rewrite the code to fix the error.

(5 marks)

(c) What problem will arise in the following constructor? How can you solve it?

```
class Student {
    int roll;
    int marks;
    Student(int roll, int marks) {.....}
}
```

(5 marks)

(d) Explain with example the term **casting** in Java.

(5 marks)

(e) Write **FOUR(4)** different Java statements that each add ONE(1) to integer variable **x**.

(4 marks)

--THE END—