12

RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree in Applied Sciences
First Year - Semester II Examination – September / October 2020

COM 1305 – OBJECT ORIENTED PROGRAMMING
Theory

Time: Three (03) hours

Answer ALL questions

1)

i. Differentiate between structural programming approaches and object oriented

programming (OOP) approach. (4 marks)

ii. Write any four (04) features of object-oriented programming. (4 marks)

iii. Explain the main concepts of OOP with examples. (8 marks)

iv. Write any two (02) benefits of OOP and explain them. (2 marks)

v. Write all the outputs of the following program.

```
class Lamp
{
        boolean  isOn;
        void turnOn()
        {
                isOn = true;
                System.out.println("Light on? " + isOn);
        }
```

```
            void turnoff()
            {
                    isOn = false;
                    System.out.println("Light on?" + isOn);
            }
    }
class  Main
{
            public static void main(String[] args)
            {
                    Lamp l1 = new Lamp();
                    Lamp l2 = new Lamp();

                    l1.turnOn();
                    l2.turnOff();
            }
}                                                                   (2 marks)
```

2)

a) Which keyword is used by classes to implement an interface?   (2 marks)

b) Explain how inheritance promotes code reuse.   (4 marks)

c) Write down different types of Inheritances. What type of inheritance is not supported by java?   (5 marks)

d) State whether the following statement is **True** or **False** and provide a brief justification
   "Encapsulation is useful for increased coupling."   (3 marks)

e) Give three differences between an interface and an abstract class in Java.   (6 marks)

3)

a) Explain the use of "this" keyword using an example.   (4 marks)

b) Below code results in a compile time error. Suggest the corrections and recode.

```
class X
{
        public X(int i)
        {
                System.out.println(1);
        }
}
```

```
class Y extends X
{
        public Y()
        {
                System.out.println(2);
        }
}
```
(2 marks)

c) Discuss the rules of overloading a method in Java. (5 marks)

d) Explain the difference between overloading and overriding. (5 marks)

e) What is the output of the following program? Explain.
```
public class Overloading
{
    private String function(String temp, int data)
    {
        return ("Dear Brain sorry for overloading you");
    }
    private String function(int data, String temp)
    {
        return ("The result of information overload is usually distraction");
    }
    public static void main(String[ ] args)
    {
        Overloading obj = new Overloading ();
        System.out.println(obj.function(4, " The result of information overload is usually distraction "));
    }
}
```
(4 marks)

4)

a) "Access modifiers and non-access modifiers are the types of modifiers in java"
Give the reasons for using access modifier in a program. (3 marks)

b) List down the non-access modifiers used in java and explain each of them. (6 marks)

c) Below code produces an error. Suggest the corrections and recode.

```
package p1;

class A
{
```

```
    private void display()
     {
        System.out.println("Rajarata University of Srilanka");
     }
}

class B
{
   public static void main(String args[])
     {
        A obj = new A();

        obj.display();
     }
}
```

(4 marks)

d) Find the output of the program below and explain your answer.

```
package pass ;

class ClassA{
   public int p = 6;
   protected int q = 7;
   int r = 5;
   private int s = 2;
}
package pass.package1;

import pass.ClassA;
 public class ClassB extends ClassA{
   int r = 8;
   private int s = 3;

   public static void main(String[] args){
     ClassA a = new ClassA();
     ClassB b = new ClassB();
     System.out.print(a.p + " ");
     System.out.print(b.p + " ");
     System.out.print(b.q + " ");
     System.out.print(b.r + " ");
     System.out.print(b.s + " ");
   }
}
```

(7 marks)

5)

a) Rational Unified Process divides one development cycle into four consecutive phases. List down the four phases.

(4 marks)

b) Discuss the advantages of using UML. (6 marks)

c) Explain the different elements of a Use Case.

Imagine that you are analyzing requirements for an online forum system. Forums can get very complex, but imagine that we have only two kinds of users that interact with our system with different responsibilities: Regular Users and Administrators. Both can log in to the system, and part of logging in is an internal authentication process. Both can also register with the system, which also uses internal authentication. After logging in, everybody can post new messages to the board, however only Administrators can check statistics and create new threads. Regular users on the other hand can send private messages to other users, while administrators do not have this ability. Draw a Use Case diagram that contains Actors, Use Cases and their relationship from the scenario described above.

(10 marks)

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