Premier University

Department of Computer Science and Engineering
Course Title: Object Oriented Programming
Question Pattern
Session: Spring 2020 (Retake)

Total marks: 35 **Time: 2hrs**

Q.1 **a.** Java is platform-independent and portable. - Justify

b. Explain the key features of object oriented programming.

c. What's the difference between =, ==, and .equals() ?

Q.2 **a.** Define class. How do classes help us to organize our programs?

b. When would private and protected class members be used in an object oriented program? Clearly distinguish between them.

c. Write Java code to exchange two integer variables using a method named **swap**. The main method will call the **swap** method and the changes inside the **swap** method must be visible to the **main** method. You also need to write the main method.

Q.3 **a.** Write down the requirements of a recursive function. Explain different ways to overload a method.

b. Describe the role of the **final** keyword and give a list of guidelines for when it should and when it should not be used.

Q.4 **a.** Define constructor. How do we invoke constructor in Java?

b. Write two different ways to create string in java. Which one is better and why?

c. In Java, method parameters are passed by value — explain what this means and give examples of the consequences.

Q.5 **a.** How multiple inheritance is implemented in Java? Can abstract class be final - explain in brief.

b. Write down a function named "Compute_Volume" to compute the volume of a 3D rectangular box with height h, width w and length 1. Then, write a new function by changing the previous function a little so that it can compute the volume of a rectangular box as well as that of a cube. Remember that, a cube has only one parameter. The "Compute_Volume" function should be able to handle the following calls:

I. Compute_Volume(30,20,10);
II. Compute_Volume(10,10,10);
III. Compute_Volume(10);

Q.6 **a.** What are the benefits of package? Explain Java API packages.

b. What do you mean by abstract class? What are the restrictions to classes that extend abstract class? Explain it with short code examples.

Q.7 **a.** What is exception? Explain the syntax of try block and catch block with an example.

b. Write short note on polymorphism. Write a java program that demonstrates the use of polymorphism.

Q.8 **a.** What are the properties of static variables and methods? Why the main() method is declared as static?

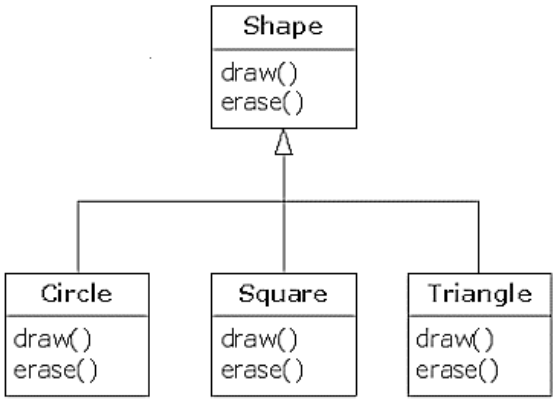
b. Define interfaces? How do you implement interface?

c. What is the output from the following Java program fragment?

```
public static void main(String[] args)
{
int A = 10;
int B = 20;
update(A, B);
System.out.println(A+ " " + B);
}
public static void update (int X, int Y)
{
X = X + Y;
Y = Y + X;
System.out.println(X + " " + Y);
}
```

Q.9 **a.** Write down the differences between **constructor** and **method**.

b. Considering the following illustration and inheritance rules, design the classes.



Q.10 **a.** Suppose there are 7 methods defines as follows: void f1(), void f2(), void f3(), void f4(), void f5(), void f6(), void f7().

There are also 4 interfaces names as: Interface i1, i2, i3 and i4.

There are also a class named MyClass that needs to be forced to implement all the 7 methods. But there are some constraints:

(i) Each interface can define at most 2 methods.
(ii) My class can only implement 1 interface.

How can you achieve this scenario? You can write code if needed.

b. What is the difference between declaring a variable in a class with protected access modifier rather than no modifier?