

North South University

Department of ECE

Mid Term Examination Summer 2020 (Undergraduate Program)

Course: Programming Language II (CSE215) Total Marks: 40 Time: 1 hour 15 minutes

(Answer any four questions)

1. a) What is meant by encapsulation and polymorphism in OOP? 3
- b) Write a java program where **this** keyword can be used to invoke the current class constructor. 4
- c) What will be the output of the following Java program? 3

```
public class If1
{
    static boolean b;
    public static void main(String [] args)
    {
        short hand = 42;
        if ( hand < 50 && !b ) /* Line 7 */
            hand++;
        if ( hand > 50 );      /* Line 9 */
        else if ( hand > 40 )
        {
            hand += 7;
            hand++;
        }
        else
            --hand;
        System.out.println(hand);
    }
}
```

2. a) What is the role of **default** and **protected** access modifier in Java? 3
- b) What happens when a class with parameterized constructors and having no default constructor is used in a program and we create an object that needs a zero-argument constructor? 3
- c) Find out the error of the following Java code. How do you fix the error? 4

```
public class Test {
    public static void main(String[] args) {
        int x = getValue();
        System.out.println(x);
    }

    public static getValue() {
        return 10;
    }
}
```

3. a) What will be the output of the Java program?

3

```
class First
{
    int i = 10;

    public First(int j)
    {
        System.out.println(i);
        this.i = j * 10;
    }
}

class Second extends First
{
    public Second(int j)
    {
        super(j);
        System.out.println(i);
        this.i = j * 20;
    }
}

public class MainClass
{
    public static void main(String[] args)
    {
        Second n = new Second(20);
        System.out.println(n.i);
    }
}
```

b) Write a java program to create an abstract class named **Shape** that contains two integers and an empty method named **printArea()**. Provide three classes named **Rectangle**, **Triangle** and **Circle** such that each one of the classes extends the class Shape. Each one of the classes contain only the method **printArea()** that prints the area of the given shape. 5

c) What is difference between *abstract class* and *interface* in Java? 2

4. a) What is meant by inheritance in OOP? Why does not Java support multiple inheritance? 3

b) What will be the output of the following Java code? 3

```
// filename Main.java
class Main {
    public static void main(String args[]) {
        System.out.println(fun());
    }
    int fun() {
        return 20;
    }
}
```

- c) Consider a class called **Fraction** that has two data members, an *int numer* and an *int denom* (for the numerator and denominator), write the following Java code: 4
Write a constructor that accepts values for the numerator and denominator as arguments.

5. a) What is blank or uninitialized final variable? How to initialize blank final variable? 3

- b) What is the output of this program? 3

```
class Base {  
    protected void foo() {}  
}  
class Derived extends Base {  
    void foo() {}  
}  
public class Main {  
    public static void main(String args[]) {  
        Derived d = new Derived();  
        d.foo();  
    }  
}
```

- c) What is the difference between “compile time polymorphism” and “run time polymorphism”. 4
Explain clearly with simple code examples.