North South University

Department of ECE

Mid Term Examination Fall 2021 (Undergraduate Program)

Course: Programming Language II (CSE215) Total Marks: 40 Time: 1 hour 20 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 EEE
{
    static boolean b;
    public static void main(String [] args)
    {
        short tt = 42;
        if ( tt < 50 && !b ) /* Line 7 */
            tt++;
        if ( tt > 50 );     /* Line 9 */
        else if ( tt > 40 )
        {
            tt += 7;
            tt++;
        }
        else
            --tt;
        System.out.println(tt);
    }
}
```

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 where ***this*** key word will be used to refer current class instance variable and ***super()*** will be used invoke immediate parent class constructor. 5

c) What is wrong with the below code? Why it is showing compile time error? 2

```
public class A
{
    public A()
   {
        System.out.println(1);

        super();

        System.out.println(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) Find out the error of the following Java code. 3

```
package pack1;

class A
{
    public A()
    {
        //public constructor
    }
}

package pack2;

import pack1.*;

class B
{
    A a = new A();
}
```

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.