North South University

Department of ECE

Final Examination Assignments Spring 2021 (Undergraduate Program)

Course: Programming Language II (CSE215) Total Marks: 50

1. a) Fill in the blanks in the code below so that, when the code runs, its output is: [2]
   1) got null pointer
   2) got illegal array store
   3) got illegal class cast

```
public class TestExceptions {
    public static void main (String [ ] args) {
        _________________ ;
        try {
            _________________ ;
        } catch (NullPointerException e) {
            System.out.println ("got null pointer");
        }
        try {
            _________________ ;
        } catch (ArrayStoreException e) {
            System.out.println ("got illegal array store");
        }
```

   b) Write a Java program to throw the *NegativeNumberException.* [3]

   c) Write a Java a program with a main thread and two user threads, **thrd1** and **thrd2**. [5]

      i) Have **thrd1** use a Scanner to read integers from a String. There should be an even number of integers.
      ii) Thread **thrd1** first reads two integers and then initializes to integer fields, x and y that are shared with **thrd2**.
      iii) Thread **thrd2** adds each new pair of integers and prints them out.

2. a) Is the following code legal? Explain. [2]

```
try {

} finally {

}
```

   b) What will be the output of the following Java code segment? Explain. [3]

```
public class MyProgram
{
    public static void throwit()
    {
        throw new RuntimeException();
    }
```

```
    public static void main(String args[])
    {
        try
        {
            System.out.println("Hello world ");
            throwit();
            System.out.println("Done with try block ");
        }
        finally
        {
            System.out.println("Finally executing ");
        }
    }
}
```

c) Write a Java program that uses multiple threads to find the integer which has the largest number of divisors between 1 and 10000 and also finds how many divisors it has. It is possible that several integers in this range have the same, maximum number of divisors. Your program should find all of them. [5]

3. a) At Point X on line 5, which code is necessary to make the code compile? [2]

```
1. public class ExceptionTest
2. {
3.    class TestException extends Exception {}
4.    public void runTest() throws TestException {}
5.    public void test() /* Point X */
6.   {
7.      runTest();
8.   }
9. }
```

b) What is the output of the following Java program? Explain. [3]

```
class s1 extends Thread
{
    public void run()
    {
        for(int i = 0; i < 3; i++)
        {
            System.out.println("A");
            System.out.println("B");
        }
    }
}
class Test120 extends Thread
{
    public void run()
    {
        for(int i = 0; i < 3; i++)
        {
```

```
            System.out.println("C");
            System.out.println("D");
        }
    }
    public static void main(String args[])
        {
        s1 t1 = new s1();
        Test120 t2 = new Test120();
        t1.start();
        t2.start();
    }
}
```

c) Write a Java program that creates threads by extending Thread class .First thread display "Good Morning "every 1 sec, the second thread displays "Hello "every 2 seconds and the third display "Welcome" every 3 seconds. [5]

4. a) Which missing code will create and start this thread? [2]

```
public class MyRunnable implements Runnable
{
    public void run()
    {
        // some code here
    }
}
```

b) What is deadlock in multithreading? Write a Java program to form deadlock in multithreading. [3]

c) Write a Java Program that creates a thread (let's call it Thread 1). Thread 1 creates another thread (Thread 2); Thread 2 creates Thread 3; and so on, up to Thread 50. Each thread should print "Hello from Thread <num>!", but you should structure your program such that the threads print their greetings in reverse order. [5]

5. a) Write a Class C which should extend Class B in the below example? [2]

```
class A
{
    class B
    {

    }
}
```

b) Why the below code is showing compilation error? [3]

```
class One
{
    void methodOne()
    {
        public class Two
        {

        }
```

```
    }
}
```

c) Design and implement a simplified voting machine class with the following specification. A voting machine has a list of candidates and the following methods: [5]

i) *addCandidate(String name)* /* Add a candidate with the name to the list */

ii) *castVote(String name)* /* Cast a vote to the candidate with the name */

iii) *printResults()* /* Print out the number of votes each candidate has received. The order does not matter */

Assume that only two attributes of a candidate, namely, the name and number of votes, are of interest here, and the size of the candidate list is unknown in advance.