North South University
Department of ECE
Final Examination Fall 2020 (Undergraduate Program)
Course: Programming Language II (CSE215)   Total Marks: 40   Time: 1 hour 10 minutes
(**Answer any four questions including question no. 2**)

1. a. In the following code, the classes Box, Pen, and Main are in the same package. Can the Main [3]
        class be compiled?

```java
class Box {
  protected void math() {
  }
}

class Pen extends Box {
}

class Main {
  public void p() {
    Pen p = new Pen();
    p.math();
  }
}
```

   b. What is the problem with below program and how do you fix it? [2]

```java
package com.cse.exceptions;
import java.io.FileNotFoundException;
import java.io.IOException;

public class TestException {
    public static void main(String[] args) {
        try {
            testExceptions();
        } catch (FileNotFoundException | IOException e) {
            e.printStackTrace();
        }
    }

    public static void testExceptions() throws IOException,
FileNotFoundException{

    }
}
```

   c. Write a Java program to implement two child threads such that one thread prints prime [5]
        numbers from 1 to 100 and other thread prints non-prime numbers from 1 to 100 (use Thread
        class). Note : Each thread has a delay of 500 millisecond after printing one number.

2. a. What will be the output of the following Java code? Explain. [3]

```java
class Testtry {
    public static int b;
    public static void main (String args[] ) {
      for (int a = 0; a < 4; a++) {
          try {
```

```java
                  switch (a) {
                      case 0 :
                              int zero = 0;
                              b = 45/ zero; break;
                      case 1:
                              int arr1[] = null;
                              b = arr1[0] ; break;
                      case 2:
                              int arr2[] = new int [3];
                              b = arr2[5];  break;
                      case 3:
                              System.out.println("Hello ");
                              break;
                  }
          } catch (Exception e) {
              System.out.println(" For : "+a+ "\n");

              System.out.println (e.getMessage() );
          }
      }
    }
}
```

b. Why runtime exceptions are not checked? [2]

c. Suppose you have a character array that contains X's and O's, and you want to rearrange the [5] contents of this array so that all the X's precede all the O's, as shown in the example below. Write your design method based on multithreaded programming and then write your code to implement your idea to solve the problem.

initial array contents

XOOOXXOXXX

contents after rearrangement

XXXXXXOOOO
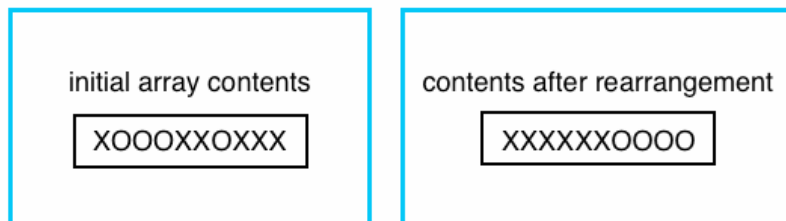
3. a. What is the output of the following Java program? Explain. [3]

```java
public class Duos {
    public static void main(String[] args) {
        new Duos().new D().new U().new O().new S().new II().Single();
    }
    class D {
        class U {
            class O {
                class S {
                    class II {
                        public void Single() {
                            System.out.println("CSE");
                        }
                    }
                }
```

```
                }
            }
        }
    }
```

b. What is the output of the following Java program? Explain   [2]

```java
import java.io.*;
class Super
{
 void show()
 { System.out.println("parent"); }
}

public class Sub extends Super
{
  void show() throws IOException
  { System.out.println("child"); }

  public static void main( String[] args )
  {
    Super s = new Sub();
    s.show();
  }
}
```

c. What is deadlock in multithreading? Write a program to form deadlock in multithreading.   [5]

4. a. Write a Class C which should extend Class B in the below example?   [3]
```java
class A
{
    class B
    {

    }
}
```

b. Can we override a super class method which is throwing an unchecked exception with checked   [2]
    exception in the sub class? Explain.

c. Write a program where interface can be used to support multiple inheritances.   [5]

5. a. Write a program that calls a method that throws an exception of type *ArithmeticExcepton* at a   [6]
    random iteration in a for loop. Catch the exception in the method and pass the iteration count
    when the exception occurred to the calling method by using an object of an exception class you
    define.

b. Write a Java program to create a super class *Transport* having members *Brand* and   [4]
    Sellingprice. Derive 2 different classes *Micro* (members – distance) and *Truck* (members –
    weight). Accept the information for n vehicles and display the information in appropriate form.
    While taking data, ask the user about the type of transport first.