King Saud University
College of Computer and Information Sciences
Computer Science Department

CSC 113 **Second Semester 1436-1437**

Quiz 2

Student Name	Student ID	Section Number	Serial Number

Q1:Trace the following Java program

```
Public class testExceptions{
Static Boolean flag=true;
publicstaticintsimplefy (int n){
while(flag){
       try{
       if(n>= 10)
       thrownewExceptionB  ();
       else
       return n;
       }
       catch(ExceptionBexp){ System.out.println(exp);
       return n/10;}
       finally{ System.out.println("finally simplefy "+ n);}}
       return 0;
       }

       publicstaticboolean validate(intnum)throwsExceptionC{
       try{
       int number = simplefy(num);
       if(number> 0)
       thrownewExceptionC();
       returnfalse;}
       catch(ExceptionAexp){ System.out.println(exp);
       returntrue;}}

       publicstaticvoid Test(intnum)throwsExceptionA{
       try{
       if(validate(num)) thrownewExceptionA("ExceptionA");
          }
       finally{ System.out.println("finally Test ");}
       }

publicstaticvoid main(String[] args){
       try{
       Test(100);}
              catch(Exception e){
              System.out.println(e + " last catch ");}}}

classExceptionAextends Exception  {
       publicExceptionA (String m){
       super(m);} }

classExceptionBextendsExceptionA {
              publicExceptionB (){
       super("ExceptionB");} }

       classExceptionCextendsExceptionA {
       publicExceptionC (){
       super("ExceptionC");}  }
```

Output:

```
ExceptionB: ExceptionB

finally simplefy 100

ExceptionC: ExceptionC

finally Test

ExceptionA: ExceptionA last
catch
```

Q2:**Completethe following code that simulate the*battleship game***

The programcreates an object of type **Ship**with (100,300) as the maximum values for itscoordinates.Then, the ship coordinates **x** and **y** are set. Finally, the program generates randomly***valX***and***valY*** and tries to hit the ship.The program includes 2 user defined exception classes:

- **ShipDestroyed**: is *an Unchecked exception*, thrown **if the ship ishit** .
- **InvalidInput:** is *a checked exception*, thrown **if the value of x or y is negative or greater than x_max or y_max**respectively.

These user defined exceptions are handled in main in addition to any other type of exceptions:

- If ***InvalidInput*** is caught:assign the half of x_max to x and half ofy_max to y .
- If ***ShipDestroyed*** is caught: the exception message is displayed.
- Any other exception, print its message
- In all cases , display the values of x and y, even if the program terminates safely.

Note: complete the code where it's suitable.

```
ClassShipDestroyedextendsRuntimeException {
ShipDestroyed() {
super("You have been hit! the ship is destroyed");
}
}
ClassInvalidInputextendsException
{
invalidInput(){
super("the value you entered is invalid");
}
}
```

```
Class Ship {
Intx ,y , x_max ,y_max;

ship(intx_max , inty_max){
this.x_max=x_max;
this.y_max=y_max;
}

// the ship is hit if vX == x and vY==y
PublicvoidshipHit (intvX,intvY)_____{
if (x==vX&& y==vY)
thrownewShipDestroyed()}

// setX will check the value of x before assigning it
PublicvoidsetX(intx) throwsinvalidInput {
if (x>x_max || x < 0)
thrownewinvalidInput();
this.x=x;}

// sety will check the value of y before assigning it
Public voidsetY(inty) throwsinvalidInput {
if (y>y_max || y < 0 )
thrownewinvalidInput();
this.y=y;
}
```

```
class test{
publicstaticvoid main(String[] args){

Random randomGenerator = new Random();
Scanner read=new Scanner(System.in);

Ship usership = new Ship(100,300);// Creates a ship

try{
int x= read.nextint();
int y = read.nextint();
usership.setX(x);
usership.setY(y);
intvalX= randomGenerator.nextint(101); //Generates a random number from 0 to 100
intvalY= randomGenerator.nextint(301); //Generates a random number from 0 to 300
usership.shipHit(valX,valY);//Hit the ship
}

catch ( InputMismatchException e) {
System.out.println(e.getMessage());}
catch (InvalidInput e){
usership.setX(100/2);  // or usership.setX(50);
usership.setY(300/2);  // or usership.setY(150);
}
catch (ShipDestroyed e) {
System.out.println(e.getMessage());}
finaly{
System.out.println("value of x " + x +"value of y " + y);}
}}
```