CSE 283 Examination 2a

1. Given the following program. Determine the output (if any) of the lines specified with the blanks.

```
import ann.easyio.*;

public class TestQ1 {

static int repeat (int times, double num)
{
   while (times >= 0)
      { num += times;
        times -= 2; }
   return (int)num;
}

public  static void main(String args[])
{
  Screen theScreen = new  Screen();
  Keyboard theKeyboard = new Keyboard();

  double a = 5.25, b = 12, c=0;
  int  x = 6, y = 2, z;

  for (z = 0; z < 5; z++)
     x += y;
  theScreen.println(x);              //_______________________________

  x = 6;
  while (a > 0)
    { x = x * 2;
      a -= 3.0; }
  theScreen.println (x);               //_______________________________

  theScreen.println (a);               //_______________________________


  x = 6; a = 5.25;

  theScreen.println (repeat(4, 2.5));   //_____________________


 for (x = 0; x< 3; x++)
     c = repeat(x,a);
 theScreen.println (c);               //_______________________________

 theScreen.println (repeat(x,a));      //_____________________
   }

}
```

2. Given the class definition on the right, determine the output (if any) of the lines of the program below. If a statement or command produces no output, leave the blank empty.

```
import ann.easyio.*;
import ClassQ2.*;


public class TestQ2
{

 public static void main (String args[])
 {
Screen theScreen = new Screen();
Keyboard theKeyboard = new Keyboard();

ClassQ2 c1 = new ClassQ2(4,6.9);

theScreen.println(c1.product());

//_____________________________

theScreen.println(c1.truncSum());

//_____________________________

c1.tPrint();

//_____________________________

//_____________________________

ClassQ2 c2 = new ClassQ2(15, 3.5);

if (c2.intIsBigger())
   c2.tPrint();
 else
  { theScreen.println(c2.product());
    theScreen.println(c2.truncSum()); }

//_____________________________

//_____________________________

  }
}
```

```
import ann.easyio.*;

class ClassQ2 {
public ClassQ2()
{  t1 = 0;  t2 = 3.5; }

public ClassQ2 (int tOne,
double tTwo)
{ t1 = tOne; t2 = tTwo; }

public double product ()
{ return t1 * t2; }

public int truncSum()
{ return (int)(t1 + t2); }

public boolean intIsBigger()
{ return t1 > t2; }

public void tPrint()
{ Screen theScreen = new
            Screen();
  theScreen.println (t1);
  theScreen.println (t2);
}

private int t1;
private double t2;
}
```

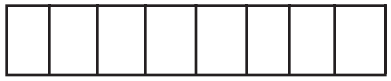
3. Given the following class which models time with hours, minutes, and seconds. It has two constructors, an output method, and a tick method. Determine the missing identifiers, symbols and numbers. Write them in the spaces provided. Note that similar tasks are not always done in the same way.

```
import ann.easyio.*;

public class Time extends Object{

public Time()
{ hours = minutes = _____________ = 0; }

public ____________ (int h, int m, int s)
{ if (h >= 0 && h <= 23)
      hours = h;

    ____________ hours = 0;

  if (m>=0 && m <= 59)

     minutes = _______;

  else minutes = 0;

  if (s <0 ______ s > 23)
    seconds = 0;
    else
    seconds = s; }

public void printTime ()
{
  Screen s = _______ Screen();
  s.print ( (hours<10 ? "0"+hours+":" : hours+":"));
  s.print ( (minutes<10 ? "0"+minutes+":" : minutes+":"));
  s.print ( (seconds<10 ? "0"+seconds : seconds+""));


}

public ______ tick() // increments time by 1 second
{
  if (seconds + 1 > _____ )
    {
     seconds = (seconds + 1) % 60;
     _________++;
    }
  if (minutes _____ 60)
    { minutes = 0;
      hours++; }
  if (hours > 23)  ________ = 0;
}

private int hours;
private int minutes;
private int seconds;
}
```

4. Assuming IEEE floating point representation of real numbers (pg. 64–68), indicate how each of the single-precision real numbers would be stored:

A. 0.375

Sign

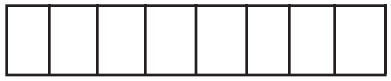


Exponent

Mantissa

B. 0.001

Sign



Exponent

Mantissa

5. The following program prompts for and receives as input a character to indicate what kind of volume (pints, quarts, or gallons) will be converted, then the amount to be converted. It uses a void method to verify the conversion type, and then do the conversion and print the results if it is legal. Determine the missing program parts. Fill in the blank with the correct identifier, command, or symbol.

```
_________ ann.easyio.*;

public class TestQ5{

  public static ___________ printConversion (char ________, double qty)
  {
    Screen s = new Screen();
    ________ (unit) {
      case 'P': s.println(qty+" pints = "+qty *0.473+" liters");

                ______________;
      case 'Q': s.println (qty+" quarts = "+qty * 0.946+ " liters");
                break;
      case 'G': s.println (qty+" gallons = "+qty * 3.79+" liters");
                break;

      _____________:  s.println ("* * Invalid conversion code");
     }
  }

  public static void main (String []args)
  {
    Keyboard theKeyboard = new Keyboard();
    Screen   theScreen = new Screen();
    char unitType;
    double volumeIn;

    theScreen.println("For volume conversion enter the information:");
    theScreen.print("Enter units: Pints, Quarts, Gallons (P, Q, or G)-> ");

    ___________ = theKeyboard.getChar();

    theScreen.print("Enter volume for conversion -> ");
    volumeIn = theKeyboard._________________();

    printConversion (unitType, _________________);

    theScreen.print("Press a key to continue");
    char hold = theKeyboard.readChar();
  }

}
```

6. Given the following program with two methods which use switch and for loops. They each return a double. They are invoked by a driver program in various ways. Determine the output (if any) for each of the output lines shown. Write the output in the blanks provided.

```
import ann.easyio.*;

public class TestQ6 {

  public static double manipulate(int a, double x)
  {
     switch (a % 4) {      // gives remainder for division by 4
      case 1 : x += a;     // be careful
      case 2 : x++;    break;
      case 0 : x *= a; break;
      case 3 : x--;
     }
   return x;
  }

  public static double loopEm (int b, double y)
  {
    for (int c = b; c < 5; c++)
      y += b;
    return y;
  }

  public static void main(String []args)
  {
    Screen s = new Screen();

    int     m = 5, n = 2, p;
    double  ss = 3.5, t = 1.2, w;

    s.println (manipulate (3,4.2));             // _______________

    w = loopEm (n,t);
    s.println (w);                              // _______________

    p = (int)manipulate (m,ss);
    s.println (p);                              //_______________

    p = (int)loopEm (3,2.9);
    manipulate (2,p);                           // _______________

    s.println (manipulate (3,loopEm(4,6.5)));   //_______________

    s.println (loopEm(5,manipulate (6,t)));     //_______________

  }

}
```

7. The following program prompts for and receives as input a distance between 0 and 1000 miles. It uses a method to determine the shipping charge according to the table on the right. Determine the missing identifiers, symbols, or numbers.

Distance	Cost
0 <= dist < 100	5.00
100 <= dist < 300	8.00
300 <= dist < 600	10.00
600 <= dist <= 1000	12.00

```
import ann.easyio.*;

public class TestQ7 {

  public static double shippingCost(double _____________)
    {
     __________ intDistance = (int)distance;

     __________ ( (intDistance / 100) + 1)
      {
       case 1 : return 5.0;
       case ___ :
       case 3 : return _______;
       case 4 :
       case 5 : return 10.0;
       default : __________ 12.0;
      }
    }

  public static void main(String[]args)
    {
      Screen s = new Screen();
      Keyboard k = new Keyboard();
      double dist;
      char more;
      do {
          dist = -999;
          while (________ < 0 || dist > 1000)
            {  s.print ("For shipping cost enter distance (0 to 1000) -> ");
               dist = k.readDouble();
               if (dist < 0 ______ dist > 1000)
                 s.println ("* * * Invalid distance * * *");
            }
          s.println ("Shipping cost = "+shippingCost(dist));
          ______ {
            s.print("Enter another? (y/n) -> ");
            _________ =   k.readChar();
            if (more != 'y' && more != 'Y' && more != 'n' && more != 'N')
              s.println ("* * * Invalid data * * Reenter * * *");
          } __________ (more != 'y' && more != 'Y' && more != 'n' && more != 'N');
        } while (more == 'y' _______ more == 'Y');
    }

  }
```

8. Given the program below which manipulates arrays – they are initialized. Determine the contents of the two arrays when the program finishes. Write in the blanks provided those final values.

```
public class TestQ8 {

  public static void main(String []args)
    {
      int numbers[] = {2, 3, -7, 12, 0};
      double dList [] = { 1.25, 4.0, 0.333, 9.0 };
      int i, j;

      i = 4;
      for (j = 0; j <5; j++)
        {
         dList [j % 3] += 1.5;
         numbers [i] = (j+1) * numbers[i];
         i--;
        }
      if (dList[2] > numbers[3])
         dList[3] = dList[2] * numbers[3];
      else
         dList[3] = dList[2] + numbers [3];
    }
  }
```

numbers	dList
[0]	[0]
[1]	[1]
[2]	[2]
[3]	[3]
[4]	

9. Given three methods that manipulate arrays. Their names along with the comments tell what they do. Determine the missing identifier, command, or symbol and write it in the blanks provided.

```
import ann.easyio.*;

public static double maxInList( double list[], __________ limit)
                                              // finds the largest item
{
  __________ tempLargest = list[0];
  for (int i = 1; i < limit; i++)

    if (_________________ > tempLargest)
      tempLargest = list[i];

  return _________________;
}

public static void swapLocations (double list[],    // swaps items in
    // locations specified
           int first, int second, int _____________)
{
  if (first < 0  || second < 0 || first >= limit || second >= limit)
     return;  // invalid locations result in no changes to the array
  else
     { double __________ = list[first];
       list[first] = list[__________];
       list[second] = hold; }             // contents of argument array in call
}                                      // now changed

public static void printList (double list[], int size)
{
   Screen out = new Screen();

   for (int x = ________; x <_____________; x++)
       out.println (list[x]);
}
```

10. Given the following program which reads data from a file. It uses two methods to do the output of a report. The data it is reading is shown at the right. The resulting output is shown also. Determine the missing commands, identifiers, or symbols and write them in the blanks provided.

```
import ann.util.*;
import ann.easyio.*;
import java.io.*;

class TestQ10 extends Object
{
  public static void printDetail(Screen s, String employeeName, double amt)
  {  /* assume existence of required output lines */
     /* all workers make $12 per hour and have 12% deducted */   }

  public static void printHeading( ______________________   s)
  {  /* assume existence of required output lines  */  }

  public static void main (String []args)
  {
   try {
    BufferedReader infile = new ______________________________ (
                             new FileReader ("testQ10.txt"));
    String valueString = "", name;
    double value;
    Screen s = new Screen();
    Keyboard k = new Keyboard();
    printHeading(s);

     _________________ = infile.readLine();
    valueString = infile.readLine();// "prime the pump" to get first data

    while (valueString !=  _____________ )
     {
        ____________ = Double.parseDouble(valueString);

       printDetail(s,_ _____________ , value);
       name = infile.readLine();
       valueString = infile.readLine();
     }
    }
     _____________ (Exception anException)
    {
    Controller.fatal ("TestQ10.main()",anException.toString());
    }
   }
}
```

Input File

David James
12.5
Robert Harmon
20.18
Susan Joshua
18.95
Trudy Stevens
15.0
Larry Albert
10.12

Output:

```
                        Java Junction Employment Agency
                               Weekly Report
Name                  Hours Worked      Rate        Gross Pay       Net Pay
------------------  --------------   ----------   -----------    ---------
David James                 12.50         12.00        156.25       137.50
Robert Harmon               20.18         12.00        252.25       221.98
Susan Joshua                18.95         12.00        236.88       208.45
Trudy Stevens               15.00         12.00        187.50       165.00
Larry Albert                10.12         12.00        126.50       111.32
```

11. Given the following hierarchy of classes. Determine the output of the statements in main() (if any). Write the output in the printed spaces provided.

```
public class TestQ11 {

public static void main( String []args)
{
  Screen s = new Screen();

  Sub2_C1 st = new Sub2_C1(3,4.5,"wow");
  Sub1_C1 q = new Sub1_C1(8,3.5,'x');
  Sub1_C1 m = new Sub1_C1();
  double d;  int x;

  x = st.getNum();
  s.println (x);                    // ___________

  s.println (q.getNum());           // ___________

  st.getInt();                      // ___________

  s.println (m.getInt());           // ___________

  for (x = 0; x < st.getInt(); x++)
    s.print(q.getCval());
  s.println();                      // ___________

  s.println (st.getDval()+q.getDval());
                                    // ___________

  s.println (st.getSval());         // ___________

  s.println (m.getCval());          // ___________
}

}
```

```
abstract  class C1 {
  C1 ( int a, double b)
  { intVal = a; dVal = b;}

  C1 ()
  { intVal = 10; dVal = 1.25; }

  int getInt()
  { return intVal; }

  double getDval()
  { return dVal; }

  protected int intVal;
  protected double dVal;
}
```

```
class Sub1_C1 extends C1 {
  Sub1_C1 (int a, double b, char c)
    { super (a,b);
      charVal = c; }

  Sub1_C1 ()
  { charVal = 'Q'; }

   int getNum()
  {  return (int)(intVal + dVal); }

  char getCval()
  { return charVal; }

  private char charVal;
}
```

```
class Sub2_C1 extends C1 {
  Sub2_C1 (int a, double b,
String s)
    {  super (a,b);
       sVal = s; }

   int getNum()
  {  return (int)(intVal *
dVal); }

   String getSval()
   { return sVal;}

  private String sVal;
}
```