CSE 11
Midterm
Fall 2008

Page 1 ___________ (10 points)
Page 2 ___________ (22 points)
Page 3 ___________ (23 points)
Page 4 ___________ (17 points)
Page 5 ___________ (12 points)
Total ___________ (84 points = 80 base points + 4 points EC [5%])
1) Which of the following are not valid Java identifiers? (Circle your answer(s).)

1stAndTen  double_down  First&Ten  main choice?  Upper-Case  five5five  _420_

2) Using the operator precedence table above, evaluate each expression and state what gets printed. Remember short-circuit evaluation with && and ||.

```java
int x = 6;
int y = -2;
int z = 13;

boolean b = !(x - 6 < y || z == 2 * x + 1);
System.out.print( "b = " + b ); ____________________

b = (x + y < z || 4 * y + z > x) && x > y;
System.out.print( "b = " + b ); ____________________

x = z + x % 4 + y * 2;
System.out.print( "x = " + x ); ____________________
```

3) What gets printed with each of the following statements?

```java
int a = 1;
int b = 3;
int c = 5;

System.out.println( a + (b + c) + " = " + (a + b) + c );
______________________________________

System.out.println( (a + b + c) + " = " + a + b + c );
______________________________________

System.out.println( (a + b) + c + " = " + a + (b + c) );
______________________________________
```
4) Write a single method that draws a filled circle on the canvas when the mouse is clicked. The circle should be 100 by 100 pixels centered at the point of the mouse click. Here is the signature for the FilledOval constructor:

\[
\text{FilledOval( double x, double y, double width, double height, DrawingCanvas canvas)}
\]

5) Assume we have a Java source file named Tunes.java and it uses at least one class in the objectdraw library. Write the full Unix command to compile this Java program.

```
This command will produce a file named
```

```
Write the full Unix command to run this as a Java application.
```

```
Assume we have correctly written a Tunes.html file. Write the full Unix command to run the above program as an applet.
```

6) What gets printed in the following program fragment?

```java
final int MAX = 4;
int i = 2;
int j;

while ( i++ < MAX )
{
    j = 7;

    while ( --j > MAX )
    {
        System.out.println( i + " " + j );
    }

    System.out.println( i + " " + j );
}
```
7) What output is produced by the following program?

```java
public class Test7 {
  private int a;
  private boolean b;
  private static int c = 42;

  public static void main(String[] args) {
    Test7 ref = new Test7();
    ref.method1(5);
  }

  public Test7() {
    a = 1;
  }

  public void method1(int x) {
    int a = x;
    int b;
    b = this.a + 2;
    this.a = b * 3;

    System.out.println("this.a = " + this.a);
    System.out.println("this.b = " + this.b);
    System.out.println("c = " + c);
    System.out.println("b = " + b);
    System.out.println("a = " + a);
    System.out.println("method2() result = " + method2(x + b));
    System.out.println("this.a = " + this.a);
    System.out.println("this.b = " + this.b);
  }

  private int method2(int x) {
    int a = x;
    int c = this.a + a;
    b = a != c;

    System.out.println("a = " + a);
    System.out.println("b = " + b);
    System.out.println("c = " + c);
    System.out.println("this.a = " + this.a);
    System.out.println("this.b = " + this.b);

    this.a = a + 2;
    this.b = b == false;
    return x + 3;
  }
}
```

Output:
```
this.a = __________
this.b = __________
c = __________
b = __________
a = __________
a = __________
b = __________
c = __________
this.a = __________
this.b = __________
method2() result = __________
this.a = __________
this.b = __________
```
8) Given the following if – else if sequence below, fill in the blanks to produce an equivalent result with a switch statement.

```java
int x = /* some value */;
String str;
if ( x / 2 == 2 )
    str = "2 stars";
else if ( x / 2 == 4 )
    str = "4 stars";
else if ( x / 2 == 6 )
    str = "6 stars";
else
    str = "a comet";
System.out.println( str );
```

```
switch( _____________ )
{
    _____________:
        str = "2 stars";
    _____________;
    _____________:
        str = "4 stars";
    _____________;
    _____________:
        str = "6 stars";
    _____________;
    _____________:
        str = "a comet";
}
System.out.println( str );
```

9) What is the output of this recursive method if it is invoked with the actual argument of 5, as in ref.mystery( 5 );? Draw Stack Frames to help you answer this question.

```java
int mystery( int a )
{
    int b = a + 3;
    if ( b > 5 )
    {
        a = mystery( a - 1 );
        System.out.println( a + " " + b );
    }
    else
    {
        a = b + 3;
        System.out.println( a + " " + b );
    }
    return b;
}
```
10) Given the following definitions:

```java
public interface Speakable
{
    public String speak();
}
```

```java
public class Puppy implements Speakable
{
    private static final String PUPPY_SPEAK = "Bark";

    public Puppy()
    {
        // ctor initialization here
    }

    public String speak()
    {
        return PUPPY_SPEAK;
    }

    public String wag()
    {
        return "wag wag";
    }
}
```

```java
public class Kitty implements Speakable
{
    private static final String KITTY_SPEAK = "Meow";

    public Kitty()
    {
        // ctor initialization here
    }

    public String speak()
    {
        return KITTY_SPEAK;
    }

    public String sleep( int time )
    {
        return time + " second cat nap";
    }
}
```

And the following variable definitions:

```java
private Puppy puppy;
private Kitty kitty;
private Speakable speakable;
```

Indicate what gets printed with the following statements (each statement is executed in the order it appears).

```java
puppy = new Puppy();
kitty = new Kitty();

System.out.println( puppy.speak() );   ____________________________
System.out.println( puppy.wag() );    _________ ___________________
System.out.println( kitty.speak() );   ________ ____________________
System.out.println( kitty.sleep( 2000 ) );   __ __________________________

speakable = puppy;

System.out.println( speakable.getClass().getName() ); ____________________________
System.out.println( speakable.speak() );   ____ ________________________

speakable = kitty;

System.out.println( speakable.getClass().getName() ); ____________________________
System.out.println( speakable.speak() );   ____ ________________________
```

What two things would we need to change in Speakable.java, Puppy.java, and/or Kitty.java in order for the statement `speakable.sleep( 1000 );` to compile and work properly? Be specific.

1) 

2)