Solutions to Laboratory Exercise 5

Basic Graphics

1. (a)
```
//including all classes in the 'java.awt' package
import java.awt.*;

public class testFrame{

  public static void main(String argv[]) {
    //create a new frame (object) with the title
                         "A Frame Test!"
    Frame testFrame = new Frame("A Frame Test!");
    //specify the size (width, height) of the window
    testFrame.setSize(200,100);
    //assign the frame to be visible
    testFrame.setVisible(true);
  } // end main
} // end class testFrame
```

   (b)
```
import java.awt.*;
import javax.swing.*;
//including all classes in the 'java.awt' and
//                       'java.swing' packages

public class sFrame{
  static void myFrame () {
    //create a new frame (object) with the
    //                   title "A Frame Test!"
    JFrame tFrame = new JFrame("A JFrame Test!");
    //specify the size (width, height) of the window
    tFrame.setSize(200,100);
    //assign the frame to be visible
    tFrame.setVisible(true);
  }

  public static void main(String [] argv) {
    // calling the method 'myFrame()'
    myFrame ();
  } // end main
} // end class sFrame
```

2.
```
import java.awt.*;

public class testFrame{

  public static void main(String argv[]) {
    Frame testFrame = new Frame("My Frame");
    testFrame.setSize(300,400);
    testFrame.setVisible(true);
  } // end main
} // end class testFrame
```

3. The window displayed cannot be closed by clicking the 'closing' button.

   The reason is that we have not yet include statements for closing the window.

4.
```
   import java.awt.*;
   import javax.swing.*;

2  class draw1 extends Frame {
       public draw1 () {
3        add ("Center", new myGraphics());
16       setTitle ("A test");
17       setSize(300,280);
18       setVisible (true);
       } // end draw1()

       public static void main (String [] arg) {
1         new draw1 ();
       } // end main

4      class myGraphics extends JPanel {
5        public void paintComponent(Graphics g) {
6          g.setColor (Color.red);
7          g.fillRect (40,20,200,40);
8          g.setColor (Color.green);
9          g.fillOval (10, 40, 80, 30);
10         g.setColor (Color.red);
11         g.drawOval (80, 80, 50, 40);
12         g.setColor (Color.yellow);
13         g.fillRect (40, 120, 200, 40);
14         g.setColor (Color.black);
15         g.drawString ("A test!", 100, 180);
         } // end paintComponent
       } // end myGraphics
   } // end draw1
```

Comments:

1: the main method is called upon.
3: method 'add' has been called. It takes an object of 'myGraphics' type as the second argument.
6: set the colour red;
7: create a filled rectangular starting at (40,20) with width=200 and height=40.
8-14: similarly, create a filled oval in green at (10,40) with width=80 and height=30, a drawing of an oval in red at (80,80) with width=50 and height=40, a filled rectangular in yellow at (40,120) with width=200 and height=40.
15: create string 'A test!' in black starting at (100,180).
16: set the title of the frame 'A test'.
17: set the size of the frame.
18: display on the screen the graphics and the frame.