CIS5200 Spring 2006 Exam #1, open book, open notes. Name: _____

1. (4 points each). a. How many components can be displayed using a BorderLayout?
ANSWER: 5

b. What is the difference between a Listener and an Adapter?
ANSWER: A Listener is an interface, so you must implement all of its methods. An Adapter is a class that provides a default implementation for each handler, so you only need to override the ones you need to use.

c. What is the purpose of a ButtonGroup?
ANSWER: To group JRadioButtons so that only one is selected at a time.

d. Why might you put a JTextArea inside a JScrollPane?
ANSWER: A JTextArea does not provide scrollbars by itself to allow viewing or editing text outside the visible area.

e. If mouseEvent.getY() returns 0, then where is the mouse?
ANSWER: At the top of the component that generated the event.

2. (80 pts). Write a program to convert between Fahrenheit and Celsius as displayed below. When the user enters a number and clicks "F to C", the display is converted using the formula C = (F-32)/1.8. (It would display 37.0 in this example). The "C to F" button does the reverse conversion. (Note: the overall dimensions are 300 by 100 and the text field has a size of 20. It uses a single layout without JPanels).

ANSWER (next page). The most common problem was trying to get the temperature using actionEvent.getActionCommand() (from the button) instead of textfield.getText().

One possible solution is below. It catches input errors (non-numeric characters) and pops up a dialog box with an error message, although I didn't require you to do this.

```java
// ANSWER: FC.java - Fahrenheit to/from Celsius converter

import java.awt.*;
import java.awt.event.*;
import javax.swing.*;

public class FC extends JFrame implements ActionListener {
  private JButton f2c, c2f;
  private JTextField text;

  // Add a text field and 2 buttons using a FlowLayout
  public FC() {
    super("Fahrenheit - Celsius Converter");
    setLayout(new FlowLayout());
    add(text=new JTextField(20));
    add(f2c=new JButton("F to C"));
    add(c2f=new JButton("C to F"));
    f2c.addActionListener(this);
    c2f.addActionListener(this);

    // This part is usually done in main() in the book
    setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    setSize(300, 100);
    setVisible(true);
  }

  // Event handling could also be done in a nested or anonymous class
  public void actionPerformed(ActionEvent event) {
    try {
      double temp=Double.parseDouble(text.getText());  // might throw
      if (event.getSource()==f2c)
        temp=(temp-32)/1.8;
      else if (event.getSource()==c2f)
        temp=temp*1.8+32;
      text.setText(temp+"");  // convert to String
    }

    // Pop up an error message (not required)
    catch (NumberFormatException x) {
      JOptionPane.showMessageDialog(this,
        text.getText()+" is not a valid number",
        "Number Format Exception",
        JOptionPane.ERROR_MESSAGE);
    }
  }
  public static void main(String[] args) {
    new FC();
  }
}
```