

**Question 1.** Indicate whether each of the following sets of binary codes could or could not be a Huffman code for some message? Explain/justify your answer.

a) 11, 101, 100, 01, 000

b) 0, 100, 101, 110, 111

c) 1, 01, 00, 010, 011

**Question 2.** Complete exercise 3.6.2 from the *Understanding Digital Communications* text.

**Question 3.** Complete exercise 3.6.3 from the *Understanding Digital Communications* text.

**Question 4.** Complete exercise 3.6.4 from the *Understanding Digital Communications* text.

**Question 5.** Consider the following simple Java program (with the import statements removed to save space). You should recognize this program from lecture. It displays a button on the screen. Initially the button's label is "Click Here". Each time the button is clicked, a JLabel displaying the text "That tickles" is added to the display and the label on the button is replaced by the text "Click again"

```
public class TouchyButtonAgain extends GUIManager {
    private JButton myButton;

    public TouchyButtonAgain() {
        this.createWindow( 170, 300 );

        contentPane.add( new JLabel( "Click on the button below" ) );
        myButton = new JButton( "Click Here" );
        contentPane.add( myButton );
    }

    public void buttonClicked( ) {
        contentPane.add( new JLabel( "That tickles!" ) );
        myButton.setText( "Click again" );
    }
}
```

Below, you will find several programs that are similar but not identical to the program shown above. The differences all involve the declarations and uses of variable and parameter names. Some of these programs will function exactly like the program shown above. Others will work differently or not at all.

For each program, indicate whether a) it will work like the original program, b) a syntax error will be detected as soon as you compile the program, or c) the program will run, but it will not behave like the original (perhaps causing an error to occur while it runs). In cases b and c, briefly describe the error or change in the program's behavior.

While we certainly cannot stop you from actually typing in and running these programs, this assignment will be of much greater value to you if you answer the questions by simply carefully examining the text of the programs.

```
a) public class TouchyButtonAgain extends GUIManager {
    private JButton myButton;

    public TouchyButtonAgain() {
        this.createWindow( 170, 300 );

        contentPane.add( new JLabel( "Click on the button below" ) );
        myButton = new JButton( "Click Here" );
        contentPane.add( new JButton( "Click Here" ) );
    }

    public void buttonClicked( ) {
        contentPane.add( new JLabel( "That tickles!" ) );
        myButton.setText( "Click again" );
    }
}
```

```
    }  
}
```

b) public class TouchyButtonAgain extends GUIManager {

```
    public TouchyButtonAgain() {  
        JButton myButton;  
  
        this.createWindow( 170, 300 );  
  
        contentPane.add( new JLabel( "Click on the button below" ) );  
        myButton = new JButton( "Click Here" );  
        contentPane.add( myButton );  
    }  
  
    public void buttonClicked( ) {  
        contentPane.add( new JLabel( "That tickles!" ) );  
        myButton.setText( "Click again" );  
    }  
}
```

c) public class TouchyButtonAgain extends GUIManager {

```
    private JButton myButton;  
  
    public TouchyButtonAgain() {  
        this.createWindow( 170, 300 );  
  
        contentPane.add( new JLabel( "Click on the button below" ) );  
        contentPane.add( new JButton( "Click Here" ) );  
    }  
  
    public void buttonClicked( ) {  
        contentPane.add( new JLabel( "That tickles!" ) );  
        myButton.setText( "Click again" );  
    }  
}
```

d) public class TouchyButtonAgain extends GUIManager {

```
    public TouchyButtonAgain() {  
        this.createWindow( 170, 300 );  
  
        contentPane.add( new JLabel( "Click on the button below" ) );  
        contentPane.add( new JButton( "Click Here" ) );  
    }  
  
    public void buttonClicked( JButton myButton ) {  
        contentPane.add( new JLabel( "That tickles!" ) );  
        myButton.setText( "Click again" );  
    }  
}
```