

Name:

[Closed book and notes.] Show all of your work clearly in the space provided or on the additional page at the end of the exam. If the additional page is used, clearly identify to which exam question it is related. Be sure to **read each problem carefully**. Note that the exam is double sided. Due to time constraints, you are not required to document your source code.

1. (5 points) List three types of objects that can be contained in a JFrame object.

2. (5 points) List the two types of objects required for event driven programming in Java.

3. (5 points) What method(s) must be implemented if a class implements the ActionListener interface?

4. (10 points) What type of value does the instanceof operator return? Give an example of when to use this operator.

5. (10 points) What is an inner class? Why are they a preferred way to implement action listener functionality?

6. (5 points) Compare and contrast the FileInputStream and DataInputStream classes.

7. (15 points) Write Java code that will create a JFrame object and specify that its content pane should use a GridLayout layout manager.

8. (15 points) Show the lines of code necessary to create a JButton object with the title "Push Me" with red letters and a green background. You may use the JButton javadoc handout as a reference.



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9. Consider the code below:

```
String input = JOptionPane.showInputDialog(null, "Enter_an_integer_between_0_and_25");
int value;
try {
   value = Integer.parseInt(input);
   System.out.println("You_entered_" + value);
} catch (NumberFormatException e) {
   System.out.println("Message_1");
} catch (RuntimeException e) {
   System.out.println("Message_2");
   return;
} finally {
   System.out.println("Message_3");
}

System.out.println("Message_4");
(a) (5 points) What will be displayed if the user enters 13?
```

(b) (5 points) What will be displayed if the user enters **thirteen**?

(c) (5 points) What will be displayed if the user enters 36?

(d) (10 points) Modify the code so that it throws an Exception object if the user enters a number less than zero or greater than 25.

(e) (5 points) Using the modified code, what will be displayed if the user enters 36?



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Additional work area for any problem. Clearly identify to which problem the work on this page is related.