

Student Name: _____ Student ID # _____

UOSA Statement of Academic Integrity

On my honor I affirm that I have neither given nor received inappropriate aid in the completion of this exercise.

Signature: _____ Date: _____

Notes Regarding this Examination

Open Book(s) You may consult any printed textbooks in your immediate possession during the course of this examination.

Open Notes You may consult any printed notes in your immediate possession during the course of this examination.

No Electronic Devices Permitted You may not use any electronic devices during the course of this examination, including but not limited to calculators, computers, and cellular phones. All electronic devices in the student's possession must be turned off and placed out of sight (for example, in the student's own pocket or backpack) for the duration of the examination.

Violations Copying another's work, or possession of electronic computing or communication devices in the testing area, is cheating and grounds for penalties in accordance with school policies.

Question 1: Graphical User Interfaces and Event-Driven Programming (30 points)

Alicia creates a button using the code

```
 JButton exitButton = new JButton("exit");
```

and places it into a JFrame named `mainFrame` using `mainFrame.add(exitButton);`.

When Alicia runs her code, she verifies that the button can be clicked as evidenced by it changing appearance when she attempts to click on it. However, clicking on the button does not cause the program to exit.

A. **Explain** why JButton *has* built-in functionality to change appearance when `exitButton` is clicked.

B. **Explain** why JButton *does not have* built-in functionality to cause the program to exit when `exitButton` is clicked.

Alicia decides to add functionality to her program so that it exits when `exitButton` is clicked.

C. **Explain** the type of class Alicia should define to add this functionality.

D. **Explain** the method(s) that the class needs in order to provide this functionality.

E. **Explain** how many objects of that class will need to be created to provide this functionality.

F. **Explain** how that object/those objects will be connected to Alicia's previous code to provide this functionality.

Question 2: Graphical User Interfaces and Event-Driven Programming Redux (20 points)

Phil takes the code written by Alicia in Question 1 and decides to add a window that pops up after `exitButton` is pressed but before the program exits in order to confirm that the user really wishes to exit the program.

A. Alicia tells Phil to be sure that the new window is modal. **Explain** what ‘modal’ means in this context and why it is appropriate to make this window modal.

B. **Explain** an appropriate component for Phil to use for this window.

C. **Explain** how Phil will need to modify Alicia’s code to incorporate this new window and its new functionality.

Question 3: Model, View, Controller (25 points)

Explain where the following method *invocations* are most likely to be found in a program for dealing with census data organized using the Model, View, Controller (MVC) design pattern. Choices are zero or more of Model, View, and Controller. Be sure to **explain** each choice.

A. `setCounty(newCounty);`

B. `getNumStates();`

C. `setModel(model);`

D. `actionPerformed(actionEvent);`

E. `processEvent(actionEvent);`

Question 6: Exceptions, Assertions, Preconditions, and Postconditions (25 points)

A. Give an example of an exception that could be generated *outside your code but caught within your code*.

B. **Explain** what could cause this exception to be generated.

C. **Explain** an appropriate way for your application to handle this error after catching it.

D. Give an example of an exception that could be generated *by your code*.

E. **Explain** why you might want this exception to be generated. (That is, **explain** why you might include in your application code to create a new exception.)

F. **Explain** one important difference between an assertion and a conditional with an exception.