Software Testing Comprehensive Exam

March 2003

ANSWER ANY FOUR OF THE FOLLOWING EIGHT QUESTIONS.

Do not attempt more than four questions on the exam. If you answer five, pick your best four and *cross out the fifth*, the one you don't want us to grade. If you provide more than four answers, we will pick the four that are the most convenient for us to grade and we will ignore the other(s). You will not get credit for the best four answers. If you are unlucky, we might grade only your worst four answers. Our selection of the appropriate four questions to grade will be final. If you don't like that, don't answer more than four questions.

1. Name and describe the four interfaces to software (i.e., the life preserver diagram). What are the inputs and outputs for each interface and what are the main testing issues at each interface.

2. Explain the "feature interaction" attack. Which category of attack does it fall under? What faults does it find? How do you apply the attack? Why is the attack effective?

3. Explain the "force all error messages" attack. Which category of attack does it fall under? What faults does it find? How do you apply the attack? Why is the attack effective?

4. Explain in detail the concept of fault injection. What is it? Why is it useful? How does one perform fault injection?

5. Explain the definition of "coverage" in testing. Describe three different types of coverage that you can measure. For each one, describe a type of bug that you would be certain to find with this type of coverage and describe a type of bug that you might miss even if you achieved 100% of this type of coverage.

6. We are going to do some configuration testing of Microsoft Word. We want to test it on the following configurations:
    - Windows 98, 2000, and XP (the latest service pack level of each)
    - Printing to an HP inkjet, a LexMark inkjet, a Xerox laser printer, and an Applewriter laser printer.
    - Connected to the web with a dial-up modem (28k), a DSL modem, and a cable modem
    - With a 640x480 display and a 1024x768 display

    - How many combinations are there of these variables?
    - Explain what an all-pairs combinations table is
    - Create an all-pairs combinations table

- Explain why you think this table is correct.

7. Imagine that you are an external test lab, and Microsoft comes to you with the newest version of MS Word. They want you to test the product. How will you decide what test documentation to give them? (Suppose that when you ask them what test documentation they want, they say that they want something appropriate but they are relying on your expertise.) To decide what to give them, what questions would you ask (list 5 questions) and how would the answers to each of those questions guide you?

8. Ostrand & Balcer described the category-partition method for designing tests. Their first three steps are:
   1) Analyze
   2) Partition, and
   3) Determine constraints

   Apply their method to this function:

   - I, J, and K are unsigned integers. The program calculates

     K = IntegerPartOf (SquareRoot (I*J)).

   For this question, consider only cases in which you enter integer values into I and J. Do an equivalence class analysis from the point of view of the effects of I and J (jointly) on the variable K. List the values you would enter into I and J and explain why.