Multiple-Choice Questions:

1. True or false? Generally, in practice, developers exhaustively test software.

   a. True

   b. False

2. True or false? All “real” software contains bugs.

   a. True

   b. False

3. Which of the following is not a desirable quality of a unit test?

   a. No I/O

   b. Fast

   c. Non-deterministic

   d. Tests one property

   e. None of the above

4. Which of the following is true of *exhaustive testing*?

   a. Generally infeasible in practice

   b. Tests all possible inputs

   c. Typically results in an intractably large set of test cases even for small programs

   d. All of the above

   e. None of the above

5. Which of the following is not a difference between unit tests and integration tests?

   a. Unit tests should not perform I/O, whereas integration tests may do so

   b. Unit tests should be deterministic, whereas integration tests may have non-determinism

   c. Unit tests should be fast (less than half a second), whereas integration tests may be slower

   d. Unit tests must be black-box tests, whereas integration tests must be white-box tests

   e. None of the above (they are all differences)

6. Which of the following is not a difference between black-box and white-box testing?

   a. Black-box tests are based only on the interface of a component, whereas white-box tests are based on the implementation

   b. Black-box tests often focus on boundary cases, whereas white-box tests tend not to

   c. White-box tests often aim to achieve particular levels of code-coverage, whereas black-box tests do not

   d. White-box tests are made by programmers, whereas black-box tests are made by ordinary users

   e. None of the above (they are all differences)

7. In __________, you hook everything together and treat the system like a black box.

   a. test-driven development

   b. system testing

   c. unit testing

   d. integration testing

   e. None of the above

8. Exhaustive testing is ______ and, in general, is ______ performed in practice.

   a. a black-box technique; often

   b. a white-box technique; never

   c. writing a test for every possible output; often

   d. writing a test for every possible input; never

   e. writing a test for every user story; often

Solutions:

1. b
2. a
3. c
4. d
5. d
6. d
7. b
8. d

Question:

What is *exhaustive testing*, and why don’t people do it in practice?

Solution:

Exhaustive testing is where you have a test case for every possible input.
People don't do it because, even for small inputs, it is too computationally intensive (e.g., takes too long) to run all the tests.

Problem:

For each piece of text below, place a “B” or a “W” next to it if it corresponds to *Black-Box* or *White-Box* testing, respectively.

______ Tests based on the implementation of a component

______ Tests based only on the interface of a component

______ Tests focus on boundary cases

______ Tests aim to achieve particular levels of code-coverage

Solution:

W Tests based on the implementation of a component

B Tests based only on the interface of a component

B Tests focus on boundary cases

W Tests aim to achieve particular levels of code-coverage

Problem:

For each piece of text below, place a “U” and/or “I” and/or “S” next to it if it corresponds to *Unit* and/or *Integration* and/or *System* tests, respectively.

______ May have non-determinism

______ Should not perform I/O

______ Tests the whole system

______ Should be fast (less than half a second)

Solution:

I,S May have non-determinism

U Should not perform I/O

S Tests the whole system

V Should be fast (less than half a second)

Problem:

For each piece of text below, place a “U” and/or “I” and/or “S” next to it if it corresponds to *Unit* and/or *Integration* and/or *System* tests, respectively.

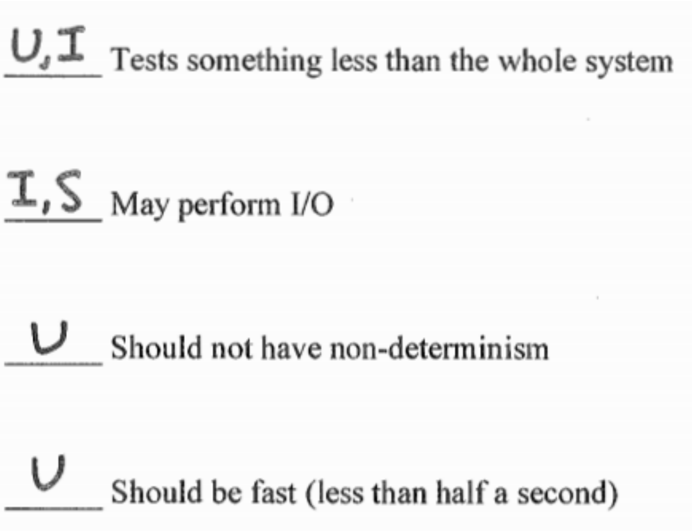
______ Tests something less than the whole system

______ May perform I/O

______ Should not have non-determinism

______ Should be fast (less than half a second)

Solution:



U,I Tests something less than the whole system

I,S May perform I/O

U Should not have non-determinism

U Should be fast (less than half a second)