Study the following questions.

1. Mutation testing is a technique used to accomplish which of the following?

a) to determine the adequacy of a software program.

b) **to determine the adequacy of the software test suite.**

c) to determine the adequacy of the software requirements.

d) to determine the implementation of the software requirements.

Ans: **b)**

2. For data flow testing, the term p-use and c-use stand for which of the following?

a) **predicate-use and computation-use.**

b) predictive-use and current-use.

c) prior-use and current-use.

d) partial-use and complete-use.

Ans: **a)**

3. Regression testing is NOT used to detect which ONE of the following?

a) An error due to a poor configuration management practice.

b) To detect an indirect impact made by the change on some already working software.

c) A build error where the wrong version of a file was used.

d) **To verify the software correction made to fix a specific problem.**

Ans: **d)**

4. A stub or mock is best defined by which one of the following?

a) A patch in the code made to correct a software problem.

b) **Dynamic "wrapper" used to simulate a method call/return using a tool**

**They use the methods exact interface and are replaced by production code.**

c) During unit testing a call is made to the actual method in another class where the desired value is hoped to be returned.

d) Code that sets inputs, records test results and compares them to expected results and summarizes test passes and failures.

Ans: **b)**

5. For data flow testing, the term du-path means which of the following?

a) the path between a data usage and its subsequent use.

b) the path between a data definition and its subsequent redefinition.

c) **the path between a data definition and its subsequent use.**

d) the path between a data usage and its subsequent definition.

Ans: **c)**

6. Which ONE of the following is NOT a problem resulting from poor configuration management?

a) Defects which were corrected suddenly reappear.

b) Features that used to work no longer work.

c) **The customer reports a problem but the tests found no defects.**

d) Test that worked perfectly on an old version but no longer do.

Ans: **c)**

**7.** Which of the following data-flow testing coverage techniques provides for the most comprehensive coverage?

a) **all du-paths**

b) all uses

c) all defs

d) all standards

Ans: **a)**

8. A sprint in Agile represents which of the following?

a) **A recurring iteration of a fixed length.**

b) A product backlog item that requires immediate correction.

c) An iteration backlog item that requires immediate correction.

d) A release typically tied to a customer event or milestone.

Ans: **a)**

9. Which of the following is NOT a typical characteristic of an Agile team?

a) **Dynamic lead programmer approach.**

b) Working software over documentation.

c) Strong customer collaboration.

d) Responding to and embracing change.

Ans: **a)**

10. A test driver is best defined by which one of the following?

a) A patch in the code made to correct a software problem.

b) Dynamic "wrapper" used to simulate a method call/return using a tool

They use the methods exact interface and are replaced by production code.

c) Hand-written classes that mimic the methods behavior, but do that with significant simplification.

d) **Code that sets inputs, records test results and compares them to expected results and summarizes test passes and failures.**

Ans: **d)**

11. Which of the following are the three representative Agile approaches studied in class?

a) Cram, XP and Kanban.

b) Scrum, XP, and Skanbun.

c) Scrum, NT, and Skanbun.

d) **Scrum, XP, and Kanban.** (XP- Extreme Programming)

Ans: **d)**

12. Are there any test difficulties introduced by code with short circuiting operators?

a) **yes, complete JaCoCo coverage with two test cases is not possible because of short-circuiting.**

b) yes, the code will return erroneous results because of short-circuiting.

c) yes, complete MC/DC testing is not possible because of short-circuiting.

d) no, it is completely testable.

Ans: **a)**

13. Given the objective to test a software interface between two different classes, which of the following tests would be the BEST choice to perform this type of testing?

a) Unit level testing

b) **Integration level testing**

c) System level testing

d) Beta testing

Ans: **b)**

14. Given the objective to test basis path coverage within a class, which of the following tests would be the BEST choice to perform this type of testing?

a) **Unit level testing**

b) Integration level testing

c) System level testing

d) Beta testing

Ans: **a)**

15. Given the objective to test the software behavior to its requirements, which of the following tests would be the BEST choice to perform this type of testing?

a) Unit level testing

b) Integration level testing

c) **System level testing**

d) Beta testing

Ans: **c)**

For JaCoCo know:

1. when we have decisions with only one condition
   1. basis path testing will give us all green diamonds and lines.
2. when we have decisions with multiple conditions
   1. basis path testing will NOT give us all green diamonds and lines.
   2. we will need to use MCDC on each multiple condition decision to achieve all green diamonds and lines.
3. when we have boundary conditions (values) we will still achieve all green diamonds and lines even though we have only tested the basis path
   1. This means that some BVs are not tested.
   2. This means that the extreme ECP values are not tested.
   3. when we add the test cases to cover all BVs and ECPs it does not get JaCoCo greener.

I will have 6 code snippets that I can draw from and will have 4 on the exam

Types of code snippets

1. ternary (like HW 5)
2. Switch (study both enumeration and binary) – see updated M16
3. Counter style (assymetric if) - see slide 32 M11
4. logic (ab+c, a + bc, etc) - no thresholds
5. nested if with logic like HW 5
6. logic with thresholds (like Gregorian calendar)

and will ask the following questions for each:

1. What is the Cyclomatic complexity of the code?
2. For the previous code, the number of tests required (including all BVs, extreme range, and MC/DC coverage)?
3. What level of coverage does the following JUnit test code provide of the previous code? Assume that the JUnit code doesn't have syntax issues.
4. For the previous test (two test cases), which ONE of the following would JaCoCo indicate coverage of the code?
5. Indicate the highest level of coverage achieved: none, statement, decision, MCDC
6. For the code and JUnit test, does the test pass?
7. What level of coverage would JaCoCo indicate?

For these questions I would create/download (from Blackboard) the code and develop your own tests and analyze coverage details.