

Test **design**: Part I

Software Testing: INF3121 / INF4121

Summary: Week 4

Test development **process**

Analysis / Design / Implementation

Categories of test design **techniques**

Static / Dynamic

Specification-based testing (black-box)

Equivalence partitioning / Boundary value analysis

Decision table testing

State transition testing



Part I: Close-ended questions

Question 1

In which **document** described in **IEEE 829** would you find **instructions** for the steps to be taken for a test including **set-up, logging, environment** and **measurement**?

- a. Test plan
- b. Test design specification
- c. Test case specification
- d. Test procedure specification



Question 2

With a highly **experienced tester** with a good **business** background, which **approach** to **defining test** procedures would be **effective** and most efficient for a project under severe **time pressure**?

- a. A high-level outline of the test conditions and general steps to be taken
- b. Every step in the test spelled out in detail
- c. A high-level outline of the test conditions with the steps to take discussed in detailed with another experienced tester
- d. Detailed documentation of all test cases and careful records of each step taken in testing

Question 3

Put the **test cases** that implement the following test conditions into the **best order** for the test **execution schedule**, for a test that is **checking modifications of customers on a database**.

- 1) Print modified customer record
- 2) Change customer address: House number and street name
- 3) Capture and print the on-screen error message
- 4) Change customer address: Postal code
- 5) Confirm existing customer is on the database by opening that record
- 6) Close the customer record and close the database
- 7) Try to add a new customer with no details at all

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

Question 4

Why are both **specification-based** and **structure-based** testing **techniques useful**?

- a. They find different types of defects
- b. Using more techniques is always better
- c. Both find the same types of defect
- d. Because specifications tend to be unstructured



Question 5

What is a **key characteristic of structure-based testing techniques**?

- a. They are mainly used to assess the structure of a specification
- b. They are used both to measure coverage and to design tests to increase coverage
- c. They are based on the skills and experience of the tester
- d. They use a formal or informal model of the software or component



Question 6

Should **pre-conditions** and **post-conditions** be **part** of a **test case**?

- a. Yes
- b. No



Question 7

_____ is the **analysis** at the **edge** of each **equivalence partition**.

We apply this test design technique because at the **edges** of **equivalence partitions**, the **results** are **more likely** to be **incorrect**.



Question 8

Which of the following would be an **example** of **decision-table** testing for a **financial** application applied at **system-test** level?

- a. A table containing rules for combination of inputs to two fields on the screen
- b. A table containing rules for interfaces between components
- c. A table containing rules for mortgage applications
- d. A table containing rules for chess

Question 9

Which of the following could be a **coverage measure** for **state transition** testing?

- V. All states have been reached
- W. The respond time for each transition is adequate
- X. Every transition has been executed
- Y. All boundaries have been exercised
- Z. Specific sequences of transitions have been exercised

- a. X, Y and Z
- b. V, X, Y and Z
- c. W, X and Y
- d. V, X and Z

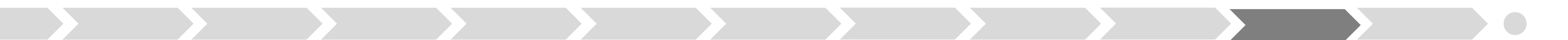


Question 10

Which of the following could be used to **assess the coverage** achieved for **specification-based test techniques**?

- V. Decision outcomes exercised
- W. Partitions exercised
- X. Boundaries exercised
- Y. State transitions exercised
- Z. Statements exercised

- a. V, W, Y or Z
- b. W, X or Y
- c. V, X or Z
- d. W, X, Y or Z



Part II: Exercises and Open-ended questions

Exercise I: Equivalence Partitioning

Postal rates for 'light letters' are 25 NOK up to 10g, 35 NOK up to 50g, plus an extra 10 NOK for each additional 25g up to 100g.

Which **test inputs** (in grams) would be **selected** using **equivalence partitioning**?

- a. 8, 42, 82, 102
- b. 4, 15, 65, 92, 159
- c. 10, 50, 75, 100
- d. 5, 20, 50, 60, 80

Exercise II

If you take the train **before 9:30 AM** or in the afternoon **after 4:00 PM** until **7:30 PM** ('rush hour') you must pay **full fare**. A **saver ticket** is available for trains **between 9:30 AM** and **4:00 PM**, and **after 9:30 PM**.

What are the **partitions** and **boundary values** to test the train **times** for this ticket types?

Which are **valid partitions** and which are **invalid** partitions?

What are the **boundary values**? (A **table** may be useful)

Derive **test cases** for the **partitions** and **boundaries**.

Do you have any **questions** about this '**requirement**'?

Is anything **unclear**?



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