

i Forside INF3121/INF4121

Day of exam: May 31th, 2017

Exam hours: 14:30 - 18:30

Permitted materials: None

Read this page thoroughly

The assignment consists of four parts.

Part 1 - Multiple Choice questions

- 15 multiple choice questions
- 2 points for each correct answer
- Maximum score for part 1: 30 points

Part 2 - Short questions

- 10 questions to be answered briefly and accurately
- The number of points may vary from question to question.
- Maximum score for part 2: 30 points

Part 3 - Use of test techniques

- Two test cases
- 10 points for the correct solution of each case.
- Maximum score for part 3: 20 points
- In this part (task 3.1 and 3.2) you can draw sketches as a supplement to your text answers. Read the last paragraph of this title page thoroughly.

Part 4 - essay

- Maximum score for part 4: 20 points

If any tasks are unclear, you can make your own prerequisites. If so, please explain them.

Sketching

in this exam, you are permitted to make drawings/use sketching for task 3.1 and 3.2. You are to use the sketching paper handed to you in the exam room. You can use more than one sketching sheet per task. See instructions for filling out sketching sheets on your desk.

You may NOT hand in sketching sheets for any other tasks than task 3.1 and 3.2. You will NOT be given extra time to fill out the sketching sheets (task codes, candidate number etc.)

1 Del 1 -Spørsmål 1

Consider the following list of test process activities:

- 1 Analysis and design
- 2 Test closure activities
- 3 Evaluating exit criteria and reporting
- 4 Planning and control
- 5 Implementation and execution

Which of the following places these in their logical sequence?

Select an alternative:

- 4, 1, 5, 3, 2
- 1, 2, 3, 4, 5
- 4, 1, 5, 2, 3
- 1, 4, 5, 3, 2

Maximum marks: 2

2 Del 1 - spørsmål 2

According to the ISTQB Glossary, which of the following is a test type?

Select an alternative:

- Acceptance testing
- Functional testing
- Component testing
- System testing

Maximum marks: 2

3 Del 1 - spørsmål 3

Complete the following sentence:

A regression test...

Select an alternative:

- ... will always be automated.
- ... will check unchanged areas of the software to see if they have been affected.
- ... is only run once.
- ... will check changed areas of the software to see if they have been affected.

Maximum marks: 2

4 Del 1 - spørsmål 4

Which statement about testing is true?

Select an alternative:

- Testing should start after the code is written so that we have a system with which to work.
- Testing is most economically done at the end of the life cycle.
- Testing can only be done by an independent test team.
- Testing should start as early as possible in the life cycle.

Maximum marks: 2

5 Del 1 - spørsmål 5

What is the main difference between a *walkthrough* and an *inspection*?

Select an alternative:

- A walkthrough is led by the author, while an inspection is led by a trained moderator.
- An inspection has a trained leader, while a walkthrough has no leader.
- An inspection is led by the authors, while a walkthrough is led by a trained moderator.
- Authors are not present during inspections, while they are during walkthroughs.

Maximum marks: 2

6 Del 1 - spørsmål 6

What is the best description of static analysis?

Select an alternative:

- The use of black-box testing
- The analysis of batch programs
- The analysis of program code or other software artifacts
- The reviewing of test plans

Maximum marks: 2

7 Del 1 - spørsmål 7

Which of the following could be used to assess the coverage achieved for structure-based (white-box) test techniques?

- 1 Decision outcomes exercised
- 2 Partitions exercised
- 3 Boundaries exercised
- 4 Conditions or multiple conditions exercised
- 5 Statements exercised

Select an alternative:

- 1, 4, 5
- 2, 3, 5
- 1, 2, 4
- 2, 3, 4

Maximum marks: 2

8 Del 1 - spørsmål 8

If the temperature falls below 18 degrees, the heating is switched on. When the temperature reaches 21 degrees, the heating is switched off. What is the minimum set of test input values to cover all valid *equivalence partitions*?

Select an alternative:

- 16 and 26 grader
- 17, 18, 20 and 21 grader
- 15, 19 and 25 grader
- 18, 20 and 22 grader

Maximum marks: 2

9 Del 1 - spørsmål 9

What does it mean if a set of tests has achieved 90% *statement coverage*?

Select an alternative:

- 9 out of 10 decision outcomes have been exercised by this set of tests.
- 9 out of 10 requirements statements about the software are correct.
- 9 out of 10 statements have been exercised by this set of tests.
- 9 out of 10 tests have been run on this modul of the software.

Maximum marks: 2

10 Del 1 - spørsmål 10

Which two specification-based (*black-Box*) testing techniques are most closely related to each other?

Select an alternative:

- Decision tables and state transition testing
- Equivalence partitioning and boundary value analysis
- Decision tables and boundary value analysis
- Equivalence partitioning and state transition testing

Maximum marks: 2

11 Del 1 - spørsmål 11

Which of the following is an advantage of independent testing?

Select an alternative:

- The others on a project can pressure the independent testers to accelerate testing at the end of the schedule.
- Programmers can stop worrying about the quality of their work and focus on producing more code.
- Independent testers don't have to spend time communicating with the project team.
- Independent testers sometimes question the assumptions behind requirements, designs and implementations.

Maximum marks: 2

12 Del 1 - spørsmål 12

Which of the following metrics would be most useful to monitor during test execution?

Select an alternative:

- Percentage of requirements for which a test has been written.
- Percentage of test cases written.
- Number of test environments remaining to be configured.
- Number of defects found and fixed.

Maximum marks: 2

13 Del 1 - spørsmål 13

According to the ISTQB Glossary, what do we call a document that describes any event that occurred during testing which requires further investigation?

Select an alternative:

- A test summary report
- An incident report
- A defect report
- A bug report

Maximum marks: 2

14 Del 1 - spørsmål 14

Which of the following are benefits and which are risks of using tools to support testing?

- 1 Over-reliance on the tool
- 2 Greater consistency and repeatability
- 3 Objective assessment
- 4 Unrealistic expectations
- 5 Underestimating the effort required to maintain the test assets generated by the tool
- 6 Ease of access to information about tests or testing
- 7 Repetitive work is reduced

Select an alternative:

- Benefits: 2, 3, 5 and 6. Risks: 1, 4 and 7.
- Benefits: 1, 2, 3 and 7. Risks: 4, 5 and 6.
- Benefits: 2, 3, 6 and 7. Risks: 1, 4 and 5.
- Benefits: 3, 4, 6 and 7. Risks: 1, 2 and 5.

Maximum marks: 2

15 Del 1 - spørsmål 15

Consider the following types of Tools:

- 1 Test management tools
- 2 Static analysis tools
- 3 Modeling tools
- 4 Dynamic analysis tools
- 5 Performance testing tools

Which of the following of these tools is most likely to be used by Developers?

Select an alternative:













- 3, 4 and 5
- 1, 2 and 5
- 2, 3 and 4
- 1, 4, and 5

Maximum marks: 2

16 **Del 2 - spørsmål 1**

One of the seven testing principles tells us that testing should start as early as possible. Explain why this principle is important.

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  |  |  | 

Words: 0

Maximum marks: 2

17 Del 2 - spørsmål 2

What are the remaining six principles?

Fill in your answer here

Format | B | I | U | x₂ | x² | I_x | [Copy] | [Undo] | [Redo] | [List] | [List] | [Omega] | [Table] | [Eraser] | [Sigma] | ABC | [Close]













Words: 0

Maximum marks: 6

18 **Del 2 - spørsmål 3**

We can group testing into different kinds of testing types, based on the specific reasoning or objective for the test effort. What are the 4 testing types, according to ISTQB' glossary?

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  |  |  | 











Words: 0

Maximum marks: 4

19 **Del 2 - spørsmål 4**

Explain the main difference between static and dynamic testing techniques.

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  | Σ | ABC | 











Words: 0

Maximum marks: 2

20 **Del 2 - spørsmål 5**

Which two main groups can we divide static testing techniques into?

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  | Σ | ABC | 













Words: 0

Maximum marks: 2

21 **Del 2 - spørsmål 6**

What is the purpose of dynamic analysis tools? Give an example of defects that we can discover with this kind of tool.

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  |  |  | 

Words: 0

Maximum marks: 3

22 Del 2 - spørsmål 7

In order to execute a test case with a test execution tool, we need to write a test script. What are the two most generic types of scripting techniques? Explain the difference between them, as well as their benefits and disadvantages. Which of the scripting techniques is the most generic? Justify your answer.

Fill in your answer here

Format - | **B** *I* U x_2 x^2 | I_x | | | | | | | ABC |











Words: 0

Maximum marks: 4

23 **Del 2 - spørsmål 8**

When conducting a risk analysis for a project, you should prioritise the risks by level of severity (or harm). Which are the two main factors in the assessment of severity?

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  | Σ | ABC | 

Words: 0

Maximum marks: 2

24 **Del 2 - spørsmål 9**

Give examples of three different types of test automation tools that are particularly useful to developers.

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x | | | | | | | | | | Σ | ABC |

Words: 0

Maximum marks: 3

25 **Del 2 - spørsmål 10**

Give two examples of circumstances where experience-based testing is particularly useful.

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x | | | | | | | | | | Σ | ABC |

Words: 0

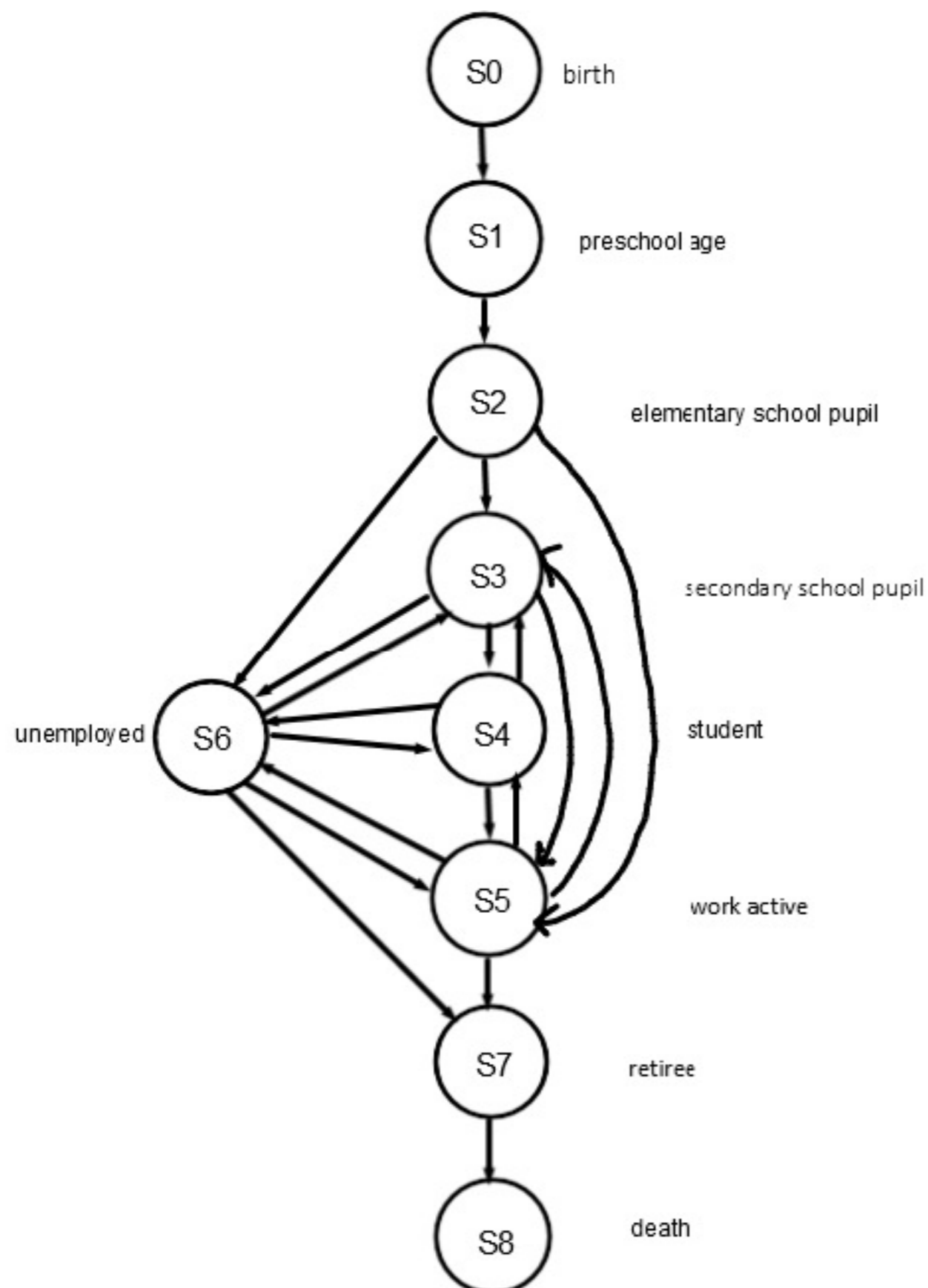
Maximum marks: 2

26 **Del 3 - case 1 - Tilstandsdiagram**

Below you see a state diagram for a human life cycle, from birth to death.

You shall not judge whether the state diagram is correct or not, but base your answers on it as it is.

Note that in this task you can hand in sketches as a supplement to your text answers. Use the sketching paper handed to you in the exam room for this. See instructions on your desk.



a) Based on the state diagram above, you shall set up a test case as a path (sequence of states) from birth to death. You shall only follow valid transitions from one state to the next. The path should be as short as possible, but still go through every state.










- What is the *state coverage* of this test case?
- What is the *transition coverage* of this test case?

b) Based on the state diagram above, is it possible to cover every valid transition in one test case? If not, how many test cases do you need to cover every transition? Justify your answers.

c) What is the highest *transition coverage* you can achieve in one single test case?

d) Why is 100% *state coverage* in most cases not enough as an *exit criteria* for testing?

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  | Σ | ABC | 

Words: 0

Maximum marks: 10

27 Del 3 - case 2 Beslutningstabeller

Note that in this task you can answer both in the text editor and with sketches/drawings. Use the sketching paper handed to you in the exam room. See instructions on your desk.

An informatics education program (study) at a university college in Norway have the following admission requirements:

- To obtain a study place, the applicant must have a general academic qualification, the mathematics course R1 from upper secondary school, and competition points above the limit of the year.
- If the applicant's competition points are below this limit, he/she is placed on the waiting list, assuming that the two first conditions are fulfilled.
- If the applicant has a general qualification, but not the R1 mathematics course, the applicant is offered a preparatory course in mathematics, assuming that the competition points are above the limit of that year.

a) Draw a decision table, which shows all the possible combinations of conditions for an applicant. The decision table shall include an action part, which shows whether or not the applicant is offered a study place, is placed on a waiting list, or is placed on a preparatory course in mathematics.

b) You shall now simplify the decision table and thus reduce the number of rules without losing any of the test cases. Justify the simplification.

c) Consider the following three different test cases:

1. The applicant has general academic qualification, the mathematics course R1 from upper secondary school, and competition points above the limit of the year.
2. The applicant has general academic qualification, the mathematics course R1 from upper secondary school, and competition points below the limit of the year.
3. The applicant has general academic qualification and competition points above the limit of the year, but not the mathematics course R1 from upper secondary school.

Do we need to have more test cases? If yes, which should they be?

Fill in your answer here

Format
-
B
I
U
 x_2
 x^2
 I_x

ABC

Words: 0

Maximum marks: 10













28 Del 4 - Essay

Describe and explain the issues and challenges associated with the introduction of testing tools into a test team or an organisation. You may base your essay on the following questions and issues:

- What are the main considerations (principles) for selecting a tool?
- What are the potential benefits and risks associated with the introduction and use of automated tools?
- How can the introduction of test automation tools influence the working environment?
- What are the special considerations we need to address when introducing:
 - Test execution Tools
 - Performance testing Tools
 - Static analysis Tools
 - Test management Tools

- What is a pilot project?
- What is the purpose of a pilot project?
- What do we mean by the term “proof of concept”?
- Which factors can contribute to success?

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  |  |  | 

Words: 0

Maximum marks: 20