

# Testing and Verification Assessment Guide 2015

**Exam Form and Content** The exam will comprise 5 questions, adding up to 100 points. From these 100 points 20-30 points will assess the knowledge-related and concept-related objectives and about 70-80 points will assess the application-related objectives.

In order to obtain a pass with distinction you need to obtain 80 out of 100. In order to obtain a pass you need to obtain 60 out of 100. The items dedicated to the pass with distinction criteria are marked with an asterisk and there will be less than 20 points of such subjects among the exam questions.

The exam will be closed book. No book, calculator or computer is allowed into the examination.

**Knowledge and Concepts** In order to obtain a pass (with distinction) you should be able to explain these concepts, be able to compare the related concepts and give examples of their application (asterisks denote those items that will be examined for pass with distinction):

- Bezier testing levels
- faults of commission and emission
- fault, error, and failure
- validation and verification
- RIP process
- functional testing
- gaps and redundancies
- structural testing
- boundary value testing
- equivalence class testing
- weak and strong, robust, equivalence class testing\*
- decision table
- classification tree
- pairwise and T-wise testing\*
- V model
- Boehm's curve
- flow graph
- finite feasibility
- DD-path

- chain
- simple and prime path
- definition-clear path
- DU-path coverage
- all-use and all-def coverage\*
- static analysis
- model checking
- regression testing
- visual GUI testing
- scenarios and meta-scenarios in VGT
- nearest inverse denominator,
- slice.

Regarding the lecture on Visual GUI testing, the following questions may be asked:

- explain the benefits of VGT (versus GUI model testing and manual GUI testing)
- describe the different levels of system architecture and their corresponding testing activities\*
- explain how VGT facilitates continuous integration and delivery

**Application** In order to obtain a pass (with distinction) you should be able to apply the necessary concepts in order to solve problems pertaining to the following subjects (asterisks denote those items that will be examined for pass with distinction):

- test-case design from requirements using the following functional testing techniques:
  - equivalence class testing,
  - decision table testing, and
  - classification tree
- number of test cases (given the number of partitions) for
  - weak normal equivalence class testing,
  - weak robust equivalence class testing,\*
  - strong normal robust equivalence class testing,\*
  - strong robust equivalence class testing
- Constructing the following artifacts for a given program:
  - flow graph,
  - DD-path graph,
  - (the set of all) simple- and prime path(s)
- Defining a set of test-cases satisfying the following coverage criteria:
  - DD-path coverage,
  - prime path coverage,
  - DU-path coverage,
  - all uses coverage,\*
  - all defs coverage\*
- Designing a network of timed-automata for a given informal description
- Defining a timed computational tree logic (TCTL) formula for a given informal property, or explaining the meaning of a formula in English
- Slicing a program given a set of variables
- Checking whether a slice is minimal and explaining whether calculating a minimal slice is always possible
- Applying test-case minimization and root cause detection for bugs