

SAMPLE EXAM

OLLSCOIL NA hÉireann, CORCAIGH
THE NATIONAL UNIVERSITY OF IRELAND, CORK

COLÁISTE NA hOLLSCOILE, CORCAIGH
University College, Cork

YEAR1/YEAR2

SAMPLE EXAM

CS3500 Software Engineering

Prof. External Examiner
Prof. Cormac Sreenan
Dr. Klaas-Jan Stol

Specific Instructions to Candidates

- 1) Read all questions carefully.
- 2) There are 4 sections, each worth 20 marks. Marks per question are indicated. Total marks for this exam is 80. Complete all questions.
- 3) Do not provide more answers than requested. For example, if a question asks to list 2 things, do not list 3 things. In such a case, only the first 2 will be evaluated and the 3rd will be ignored.

Duration of Exam: 90 Minutes

**PLEASE DO NOT TURN THIS PAGE UNTIL
INSTRUCTED TO DO SO**

**PLEASE ENSURE THAT
YOU HAVE THE CORRECT EXAM PAPER**

SAMPLE EXAM

**NOTE: MARKS GIVEN PER QUESTION ARE INDICATIVE
AND NOT NECESSARILY REPRESENTATIVE OF A REAL EXAM.**

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| ■ Q1 Requirements | Total 20 Marks |
| (a) Many techniques exist to identify requirements. Name one and briefly describe it (1-2 sentences). | (4 marks) |
| (b) What is the difference between a functional and a non-functional requirement? | (4 marks) |
| (c) A system may have many different stakeholders. Name 3, and for each, name an example of a concern that they might have. | (6 marks) |
| (d) Why is it difficult to separate a system's specification (as captured in a Software Requirements Specification) from its implementation? | (4 marks) |
| (e) What does the "T" stand for in the acronym SMART (as discussed in the context of requirements), and describe what this means (max. 1-2 sentences). | (2 marks) |
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| ■ Q2 Software Architecture & Design | Total 20 Marks |
| (a) In the context of software architecture, what is a component? | (2 marks) |
| (b) The selection of an architectural style is done based on trade-offs. Name one benefit and one drawback of selecting the client-server style over the peer-to-peer style. | (6 marks) |
| (c) There are many quality attributes a system might have. The lectures discussed 6, including "security." Explain what the quality attribute "security" is concerned with. | (4 marks) |
| (d) To document an architecture, we typically need different views to explain different aspects. In the lectures we discussed the "Views & Beyond" approach by Clements and his colleagues. Which 3 types of views do they define, and for each state its purpose. | (6 marks) |
| (e) Modularization is an important design principle. Explain briefly what it means (1-3 sentences) and why it is desired. | (2 marks) |

■ **Q3 Software Testing & Maintenance** **Total 20 Marks**

- (a) Name an example of a static analysis technique and briefly explain it (1-2 sentences max.) **(4 marks)**
- (b) What's the main difference between white-box and black-box testing? **(4 marks)**
- (c) Manny Lehman defined several "Laws of Software Evolution" that apply to so-called "E-type" systems. What characterizes an E-type system (as opposed to P-type and S-type systems) in the context of software evolution? **(6 marks)**
- (d) There are at least 4 types of software maintenance activities. Name two, and for each describe what it means (1-2 sentences max.) **(4 marks)**

■ **Q4 Software Process & Organization** **Total 20 Marks**

- (a) The Scrum software development framework defines the "Sprint Planning" ceremony (or 'event'). What is the *goal* of a Sprint Planning meeting? **(4 marks)**
- (b) Three questions are asked of each team member during the Daily Stand-up or Daily Scrum ceremony. Which are they? **(6 marks)**
- (c) There are many problems with the Waterfall model. Name one, and explain how Agile methods/practices help to address that problem. **(4 marks)**
- (d) XP originally consisted of a set of 12 practices, one of which is Pair Programming. Briefly explain what Pair Programming means and what benefit is expected from it. **(6 marks)**

END OF EXAM