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

COLÁISTE NA hOLLSCOILE, CORCAIGH
University College, Cork

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Semester 1 – Winter 2017

CS3500 Software Engineering

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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

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PLEASE ENSURE THAT YOU HAVE THE CORRECT EXAM PAPER

■ Q1 Requirements — Total 20 Marks

(a) A Software Requirement Specification (SRS) document serves several purposes. Name one. **(2 marks)**

(b) Requirements should specify ***what*** the software should do, but not ***how*** it should be implemented. Give an example of how this is often a problem in practice. **(4 marks)**

(c) Good requiremernts are so-called "SMART" requirements. What does the acronym "SMART" stand for? For each term (S, M, A, R, and T) briefly explain (in one sentence) what it means. **(10 marks)**

(d) There are several methods/techniques to identify requirements. Name 2 such methods/techniques, and briefly describe them (in no more than 1 or 2 sentences). **(4 marks)**

■ Q2 Software Architecture & Design — Total 20 Marks

(a) Software Architectures often have an "architectural style." Why is knowing an architecural style important? **(2 marks)**

(b) Describe one difference between a module and a component. **(2 marks)**

(c) There are several heuristics that can be used to identify Architecturally Significant Requirements. Seven categories were presented in the lectures—name two of these categories. **(4 marks)**

(d) The lectures discussed at least six Quality Attributes (QA) in detail. Name one and briefly describe it (Max. 1 or 2 lines). **(2 marks)**

(e) There are a number of general good design principles. Name two principles discussed in the lectures, and for each, explain briefly (in one or a few sentences) what it is about. **(4 marks)**

(f) Consider the system architecture in Figure 1 (see next page). Which architectural style does this system resemble, and name one potential benefit and one drawback of this style. **(6 marks)**

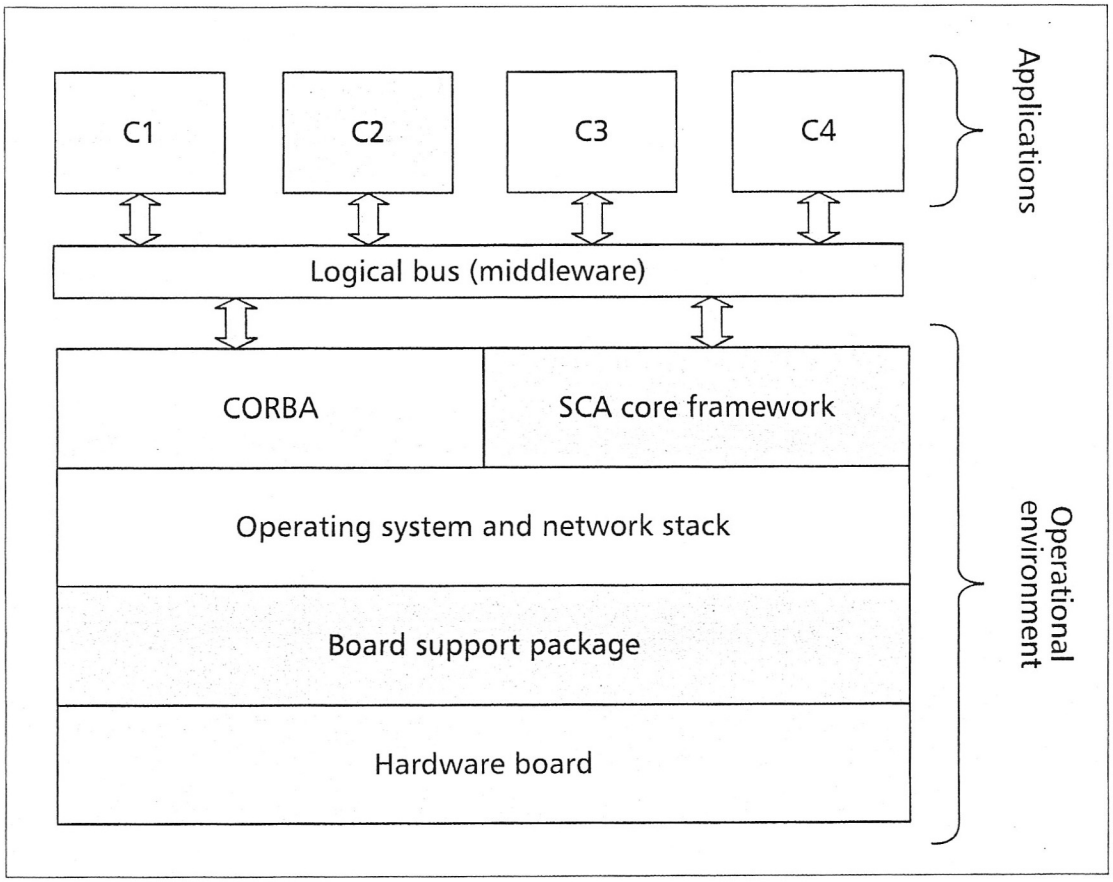

FIGURE 1: Which Architectural Style is this? (Question Q2.f).

Q3 Software Testing & Maintenance — Total 20 Marks

(a) In software testing, there are so-called 'static' and 'dynamic' analysis techniques. What is the difference? **(4 marks)**

(b) There are at least 3 levels of "granularity" to test software—each level of testing has a different "scope". Name the 3 levels discussed in the lectures, and describe the purpose that each serves. **(6 marks)**

(c) The so-called "SPE" classification defines 3 types of software: S-type, P-type, and E-type systems. Describe each briefly (Just a few lines per type), and give an example of each. **(6 marks)**

(d) Describe what the term "Technical Debt" means in software development. **(4 marks)**

Q4 Software Process & Organization — Total 20 Marks

(a) The "traditional" approach to software development is often referred to as the "Waterfall" approach. Name two problems with the waterfall approach. **(4 marks)**

(b) The original Extreme Programming method defines 12 practices. Name two of them, and briefly describe each (Max. 1-2 lines). **(6 marks)**

(c) The most widely used Agile method is called Scrum, which defines several ceremonies, roles, and artifacts. Name one ceremony, one role, and one artifact, and for each explain briefly what it is. **(6 marks)**

(d) What is Conway's Law, and explain why it is important for software development. **(4 marks)**

END OF EXAM