RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree in Information and Communication Technology
Second Year Semester I Examination Oct./Nov. 2015

ICT 2402 SOFTWARE ENGINEERING

Time Allowed: 3 hours.

INSTRUCTIONS TO CANDIDATES

- This paper consists of two Sections **A** and **B** on 4 pages including this page.
- Sections **A** contain **TWO (02)** questions and **answer ALL** the questions in the section A.
- Section **B** contains **FOUR (04)** questions. Answer **ANY THREE (03)** questions from Section **B**.
- This examination accounts for 60% of the course assessment. The total maximum mark attainable is 100. The marks assigned for each question and section, thereof are indicated in square brackets.
- This is a closed book examination.
- Mobile phones or any other communication devices are not permitted.
- Clearly state the assumptions you make. If you have any doubts regarding the interpretation of the wording of a question, make your own decision, but clearly state it on the script.

Section A

1 (a) Briefly describe the difference between system software and application software.
[3 marks]

(b) Briefly describe two (02) challenges that Software Engineering is facing.
[4 marks]

(c) Briefly describe two (02) disadvantages of Component-based software engineering.
[3 marks]

(d) Briefly describe the difference between Enduring requirements and Volatile requirements.
[3 marks]

(e) Briefly describe two (02) alternatives to Natural Language (NL) for requirement specification.
[4 marks]

(f) Briefly describe two (02) "Cohesion Levels".
[3 marks]

2 (a) Briefly describe three (03) requirements validation techniques.
[6 marks]

(b) Name three (03) factors that affect the program language selection.
[3 marks]

(c) Briefly describe two (02) coding errors that can be detected in static analysis/ code review.
[3 marks]

(d) Briefly describe the four (04) steps in the Risk Management process.
[4 marks]

(e) Briefly describe two (02) human factors that you should consider in UI design.
[4 marks]

Section B

3 (a) You have been hired as a consultant for a small regional bank to advise them on their future procurement of a banking system (a software system which would cover all the banking activities of the bank). Your client is a small regional bank with 20 small branches and 10, 000 plus customers. They do not have a dedicated IT staff. Rest of the staff has little IT knowledge and would require training to use a banking software system.

Describe different methods (such as buying an off-the-shelf banking system, in-house development, etc.) for acquiring a banking system. Suggest a suitable method for acquiring a banking system for the above mentioned bank.

[12 mark]

(b) Describe the problems that you may face when communicating with your clients in the above scenario mentioned in 3(a) section.

[8 marks]

4 (a) Assume that you are a student who is working on a two year research project in your degree program. Under this, you will be developing new knowledge areas and will be testing new ideas by implementing them.

Currently you have experience with following Software Process Models.

- Waterfall model
- Spiral Model
- Agile Model
- Cowboy Coding
- Extreme programming

Suggest a suitable Software Process Model to be used in the above 4(a) scenario. Describe why you are selecting it and rejecting others.

[10 marks]

(b) Describe the importance of using a proper Version Controlling System for the above project?

[5 marks]

(c) Describe the importance of having proper project plan for the activities of the above research project.

[5marks]

5 (a) Assume that you are a consultant for retail company. This company already uses a legacy information system to manage their activities. The current system is capable of handling all the functions and data of the business. However, it crashes frequently and there are considerable performance issues.

Suggest a suitable strategy for the evolution of this legacy system. Justify your answer.

[10 marks]

(b) Describe why it is difficult to maintain legacy systems. Consider "Lehman's Laws" and maintenance cost factors in your answer.

[10 marks]

6 (a) Assume that you are QA Engineer who is working for a software development

company. In the project that you are working on, you are getting more than 10, 000 lines of code each day. There are four QA engineers in the project team including you.

Describe the importance of "Static Analyzers" in the above situation. Consider efficiency and budget considerations when forming your answer.

[10 marks]

(b) As a QA engineer describe what you understand by the term "code quality" and describe the importance of it.

[10 marks]