THE OPEN UNIVERSITY OF SRI LANKA
DEPARTMENT OF COMPUTER SCIENCE
B.Sc. IT DEGREE PROGRAMME 2023/2024
COU3303: SOFTWARE ENGINEERING
FINAL EXAMINATION
DURATION: **TWO HOURS ONLY (2 HOURS)**

Date: 10.12.2024 Time: **09.30am – 11.30am**

Answer **FOUR** Questions Only.

Q1)

a. Explain how you would describe software engineering to someone with no technical background, using relevant examples. (5 marks)
b. What are the essential features of good software, and how do these features contribute to the overall quality of the software? (10 marks)
c. Identify one essential feature of software for critical systems and explain why it is particularly important in such contexts. (10 marks)

Q2)

a. Explain the importance of software validation and verification. (5 marks)
b. Describe how software verification is carried out through the following testing approaches:
   i) Unit Testing (5 marks)
   ii) Integration Testing (5 marks)
c. Explain the role of quality management in software development and describe how it ensures the delivery of high-quality software. (10 marks)

Q3)

a. What are the main types of software maintenance? (5 marks)
b. Describe the following three types of software maintenance:
   i) Maintenance to optimizing the structure of a database ensures the efficiency of the software in the future.
   ii) Maintenance to redesigning report format for understanding.
   iii) Maintenance to fix errors in the functionality of the software. (10 marks)
c. Explain the key steps involved in the software deployment process during the implementation stage and discuss the challenges that may arise during deployment. (10 marks)

Q4)

a. Describe how the following two cost estimation techniques are applied in software development cost modeling with examples:
   i) Expert judgement
   ii) Estimation by analogy (5 marks)
b. How does the "Price-to-Win" cost estimation method differ from the previously mentioned techniques? (10 marks)
c. Describe each of the following three categories of risks that can affect a software development initiative:
   i) Project risks
   ii) Product risks (10 marks)

Q5)

Requirements Engineering (RE), a subdiscipline of Software Engineering, is the application of an engineering approach to developing a requirements specification.

a. Briefly explain the requirement engineering process. (5 marks)
b. Differentiate between functional and non-functional requirements in software engineering. Provide examples for each and explain why both are critical for successful software development. (10 marks)
c. What is a requirements specification, and why is it an essential deliverable in Requirements Engineering? (10 marks)

Q6)

Assume that you have been appointed as a software engineer in a new software development project and project manager has told you that the team will be following an iterative/incremental development life cycle.

a. Describe the iterative development process. (5 marks)
b. Upon starting the project, you discover that the domain is well understood, the product will use existing technology, the requirements are unlikely to change, and all resources for the project are available. Suggest a suitable development process for this project and justify your choice. (10 marks)
c. Describe THREE desirable features of a repository to support software configuration (or source code) management, and briefly explain why they are needed. (10 marks)