

University of Ruhuna- Faculty of Technology
Bachelor of Information and Communication Technology Honours Degree
Level 3 (Semester II) Examination, November 2025
Academic year 2023/2024

Course Unit: ICT3262- Software Verification & Quality Assurance (Written) Duration: 2 hours

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Answer all **four(04)** questions.

1.

- a. Explain the concepts of software verification and software validation. (20 marks)
- b. Explain independent walkthroughs and guided walkthroughs, emphasizing their objectives and key differences. (20 marks)
- c. Describe how software verification contributes to risk reduction in the following phases of software development:
 - i. Requirements (10 marks)
 - ii. Design (10 marks)
 - iii. implementation/coding (10 marks)
- d. Assume that you are conducting a workshop on software audits. Using a diagram, explain the steps involved in auditing a software project. (30 marks)

2.

- a. Given a project with 5000 lines of code and 25 reported defects, calculate the defect density of the project. (15 marks)
- b. Explain the role of software test metrics in ensuring software quality. (15 marks)
- c. Software testing helps to ensure security and performance, protects against costly failures, and ultimately improves user satisfaction and trust. Differentiate between functional and non-functional testing with examples. (30 marks)
- d. A software company is releasing a critical payroll system. Describe at least four types of testing you would perform to ensure reliability and explain why each is important. (40 marks)

3.

- a. Define a software test plan and explain its purpose in the software testing process.
(20 marks)
- b. Differentiate suspension criteria and exit criteria in test plan development. (20 marks)
- c. Explain the difference between traditional development and Test-Driven Development in the context of way of conducting, defect detection, risk of late defects. (30 marks)
- d. A risk is an uncertain or chance event that planning cannot completely prevent or control. Identify the most appropriate response strategy and explain how you would assess the following risks:
 - i. A software company plans to launch a new cloud-based service in a foreign country but faces strict data privacy laws, making compliance costly and complex. (15 marks)
 - ii. A logistics company depends heavily on a single warehouse for storing goods. There is a risk of operational disruption if the warehouse suffers damage due to fire, flood, or other accidents. (15 marks)

4.

- a. Explain two (02) methods that can be used to handle defects with an example.
(20 marks)
- b. Define a software defect and explain its difference from a software error and failure.
(20 marks)
- c. Explain the concepts of Process and Product Quality Assurance (PPQA) describe three (03) benefits of implementing them in software development. (30 marks)
- d. As the Quality Assurance Engineer of a company, explain how you would apply quality engineering principles to your projects by addressing the two (02) main stages of Quality Engineering (QE). (30 marks)

*****END OF THE PAPER*****