BT-7/D-23 47244

SOFTWARE VERIFICATION & VALIDATION AND TESTING

Paper–PE-CS-D-403A

Time Allowed : 3 Hours] [Maximum Marks : 75

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. All questions carry equal marks.

UNIT–I

1. (a) What is software testing, and why is it important in the software development process? Discuss.

   (b) Explain the difference between verification and validation in software testing.

2. (a) What is the difference between error, fault and failure? Discuss.

   (b) What is a fault of omission, and how does it differ from a fault of commission? Provide examples of situations where a fault of omission might have significant consequences.

UNIT–II

3. (a) What is boundary value analysis, and why is it important in software testing? How does boundary value analysis contribute to the overall test coverage of a software application? Discuss.

(b) What is mutation testing, and why is it considered a powerful technique for assessing the quality of test suites? Describe the difference between strong mutation and weak mutation testing strategies.

4. (a) Provide an example of cyclomatic complexity and how it is related to structural testing.

(b) What is equivalence class partitioning? How does equivalence class partitioning help in reducing the number of test cases while maintaining thorough test coverage? Discuss.

UNIT–III

5. (a) What are the primary objectives of regression testing? How do you prioritize test cases for regression testing when time and resources are limited? Discuss.

(b) What is integration testing? What types of bugs are detected by t? Discuss.

6. (a) Explain the difference between alpha testing and beta testing in the context of acceptance testing.

(b) What is unit testing, and why is it considered the foundation of the testing pyramid? How does it differ from integration testing and system testing? Discuss.

UNIT–IV

7. (a) What are the primary goals and objectives of stress testing? Explain the difference between stress testing and load testing.

(b) What is the McCall Quality Model, and what is its significance in software engineering? Describe the three main categories of factors in the McCall Quality Model.

8. (a) What is CMM? How does an organization typically begin its journey towards CMM maturity levels, and what are the initial steps? Discuss,

(b) How does extreme testing contribute to ensuring the robustness and resilience of a software system?