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Module 1 – Software Testing, SDLC, QA & Testing Strategies

1. Explain the nature of software errors. Why is software testing necessary?
2. Define software testing. Explain the basic software testing process with its major activities.
3. What are the principles of test case design? Explain the characteristics of a good test case.
4. Explain the different stages of test execution, test reporting, and test documentation.
5. Explain the Software Development Life Cycle (SDLC) and its different phases.
6. Describe the role of software testing in each phase of the SDLC.
7. What are software quality factors? Explain any five quality factors and their impact on software testing.
8. Define software quality. Differentiate between Quality Assurance (QA), Quality Control (QC), Quality Management (QM), and Software Quality Assurance (SQA).
9. What is Verification and Validation (V&V)? Explain their significance in software development.
10. Differentiate between Verification and Validation with suitable examples. Explain different V&V mechanisms.
11. Explain Software Reviews, Inspection, and Walkthrough. Differentiate between Inspection and Walkthrough.
12. Explain the strategic approach to software testing. What factors should be considered while developing a testing strategy?
13. Explain Unit Testing, its purpose, techniques, and best practices.
14. What is Integration Testing? Explain different approaches to integration testing and discuss its challenges.
15. Explain Validation Testing and System Testing. How do they ensure that software meets user requirements?

Module 2 – Black Box, White Box, Metrics, Defects & SQA

16. Differentiate between Black Box Testing and White Box Testing with suitable examples.
17. Explain Equivalence Partitioning technique with a suitable example.
18. What is Boundary Value Analysis (BVA)? Explain the technique with an example.
19. Explain Decision Table Testing. Construct a decision table for a suitable real-world application.
20. Explain State Transition Testing with a suitable example.
21. What is White Box Testing? Explain Statement Testing and Branch Testing with examples.
22. Explain experience-based testing techniques: Error Guessing, Exploratory Testing, and Checklist-Based Testing.
23. What are software metrics? Explain their importance in software testing and quality improvement.
24. Explain different types of software metrics. What are complexity metrics? Discuss their significance in testing.

25. Define a software defect. Explain the complete defect lifecycle with a suitable diagram.
26. Explain the defect management process, including defect reporting, tracking, prioritization, and closure.
27. What is Software Quality Assurance (SQA)? Explain its major activities and approaches.
28. Explain Statistical Quality Assurance and Statistical Process Control (SPC). How are they used for software quality improvement?
29. Explain software reliability. Discuss software reliability measurement and techniques for improving reliability. Also explain the role of ISO 9000 quality standards.
30. Explain Formal Technical Reviews (FTR) and quality improvement tools such as Pareto Diagrams, Cause-and-Effect Diagrams, Scatter Diagrams, and Run Charts.