

VALLIAMMAI ENGINEERING COLLEGE

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

QUESTION BANK



ME CSE - III SEMESTER

912305 SOFTWARE QUALITY ASSURANCE AND TESTING

Regulation – 2019

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Prepared by

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SUBJECT : CP5005 SOFTWARE QUALITY ASSURANCE AND TESTING

SEM / YEAR: ME CSE - II / III

UNIT I - SOFTWARE TESTING - CONCEPTS, ISSUES, AND TECHNIQUES

Quality Revolution, Verification and Validation, Failure, Error, Fault, and Defect, Objectives of Testing, Testing Activities, Test Case Selection White-Box and Black ,test Planning and design, Test Tools and Automation, . Power of Test. Test Team Organization and Management-Test Groups, Software Quality Assurance Group ,System Test Team Hierarchy, Team Building.

PART – A

Q. No	Questions	BT Level	Competence
1	Show, how you will measure software quality.	Apply	BTL 3
2	Quote Quality Audit.	Remember	BTL1
3	Arrange the various quality factors of Software.	Analyze	BTL 4
4	Create the Quality Framework.	Create	BTL 6
5	Assess Verification.	Evaluate	BTL 5
6	Differentiate quality control and quality assurance.	Analyze	BTL 4
7	Analyze the differences between Verification and Validation.	Analyze	BTL4
8	Demonstrate four topics addressed by ISO 9001:2000.	Apply	BTL 3
9	Discuss open bug.	Understand	BTL2
10	Estimate, what are the Risk levels in Bug Fixing?.	Understand	BTL2
11	Tell the methods to measure defects and manage it.	Remember	BTL 1
12	Generalize the measurement techniques available in defect management.	Create	BTL 6
13	Label any two IEEE standards of quality.	Remember	BTL 1
14	Define Quality Assurance and tell its uses.	Remember	BTL 1
15	What are techniques available for Quality process?	Understand	BTL2
16	What is a quality metric? Give any two examples of quality metrics.	Understand	BTL2
17	List the origins of defects.	Remember	BTL1

18	Define the term 'cost of Quality'.	Remember	BTL1
19	Classify the elements of Quality assurance.	Apply	BTL 3
20	Recall basic principles of testing.	Evaluate	BTL 5

PART-B

1	(i) Analyze Quality cost of software engineering process in detail? (ii) Describe the Quality Framework with suitable diagram?	(7) (6)	Analyze	BTL 4
2	Illustrate about: - (i)Verification techniques with an example. (ii)Validation Strategies available in testing process.	(7) (6)	Apply	BTL 3
3	i) Discuss with examples the validation checks and verification checks in software process. ii) What are the main objectives of quality control? Discuss	(7) (6)	Understand	BTL 2
4	Describe in detail about: - (i)Defect taxonomy. (ii)defect management.	(7) (6)	Remember	BTL 1
5	Discriminate the measurements available in defect management process.	(13)	Evaluate	BTL 5
6	Explain in detail about the statistics of defects in testing process.	(13)	Understand	BTL2
7	Explain the various Quality Assurance methods in detail.	(13)	Remember	BTL 1
8	Discuss about the various IEEE standards for Software Quality in detail.	(13)	Understand	BTL 2
9	Describe various Quality control processes in detail with suitable example.	(13)	Remember	BTL 1
10	Examine how software quality assurance is ensured in a software development system.	(13)	Remember	BTL 1
11	Compose the importance of Quality assurance in Testing process with the help of suitable examples.	(13)	Create	BTL 6
12	(i)Discriminate how the defect leads to failure in project development. (ii) Recommend the check lists to prevent the projects from defects.	(7) (6)	Evaluate	BTL 5
13	i) Explain about the different software quality models. ii) Explain in detail about View of Quality.	(7) (6)	Analyze	BTL 4
14	Illustrate briefly about the software quality attributes with respect to i) product operation. and product transition. iii) product revision.	(7) (6)	Apply	BTL 3

PART – C

Q.No	Questions	BT Level	Competence
1.	Develop software quality policies for a college automation software	Create	BTL 6

	process.		
2.	Assess the purpose of process and product quality assurance? Why quality assurance for process is important? Discuss with examples.	Evaluate	BTL 5
3.	Create a Verification and validation process for an automobile software process to check the product quality.	Create	BTL 6
4.	What do you infer from defect taxonomy in management of defects for the software projects? Justify whether it is important in validation process.	Analyze	BTL 4

UNIT II - SYSTEM TESTING

System Testing - System Integration Techniques-Incremental, Top Down Bottom Up Sandwich and Big Bang, Software and Hardware Integration, Hardware Design Verification Tests, Hardware and Software Compatibility Matrix Test Plan for System Integration. Built-in Testing. Functional testing - Testing a Function in Context. Boundary Value Analysis, Decision Tables.

PART – A

Q. No	Questions	BT Level	Competence
1	Describe the difference between black-box and white-box testing techniques?	Remember	BTL 1
2	If a program passes all the black-box tests, it means that the program should work properly. Then, in addition to black-box testing, why do you need to perform white-box testing?	Create	BTL 6
3	Discuss the advantages and disadvantages of top-down and bottom-up testing.	Understand	BTL2
4	What is software quality?	Remember	BTL 1
5	Explain five views of quality.	Analyze	BTL 4
6	Develop Check-in Request Form	Create	BTL 6
7	What are the four key concepts in functional testing?	Create	BTL 1
8	Define boundary value analysis.	Remember	BTL 1
9	Explain data integrity and data conversion.	Evaluate	BTL 5
10	Describe acceptance test execution.	Understand	BTL2
11	Examine the outline of useful framework for preparing an SIT plan.	Apply	BTL 3
12	Can an incorrect, that is, faulty, software system be considered to be reliable? Justify your answer.	Evaluate	BTL 5
13	Why are acceptance test cases executed in two phases?	Understand	BTL2
14	Who should define the acceptance quality attribute criteria of a test project. Justify your answer?	Remember	BTL 1
15	Discuss the advantages and disadvantages of customer involvement in testing	Understand	BTL2
16	What are the objectives of system testing?	Remember	BTL 1
17	Explain criteria must the system meet in order to be acceptable?	Analyze	BTL 4
18	Analyse what is meant by DoS attack?	Analyze	BTL 4
19	Show the differences between UAT and BAT?	Apply	BTL 3
20	Examine how the idea of software reliability can uncover missing requirements.	Apply	BTL 3

PART-B

1.	Discuss top-down and bottom-up approaches to integration testing.	(13)	Understand	BTL2
2.	Describe the circumstances under which you would apply white-box testing, back-box testing, or both techniques.	(13)	Remember	BTL 1
3.	Develop an integration test plan for your current test project.	(13)	Create	BTL 6
4.	Explain about i. Functional testing. ii. Testing a function in context.	(7) (6)	Analyze	BTL 4
5.	Explain i. Framework for Entry Criteria to Start System Integration ii. Framework for System Integration Exit Criteria	(7) (6)	Evaluate	BTL 5
6.	Describe i. Built in testing ii. Functional testing	(7) (6)	Remember	BTL 1
7.	Explain briefly about test plan for system integration.	(13)	Analyze	BTL 4
8.	Describe in brief notes i. Hardware Design Verification Tests, ii. Hardware and Software Compatibility Matrix	(7) (6)	Understand	BTL2
9.	What is functional testing and discuss about testing a function in context.	(13)	Remember	BTL 1
10	Analyze i. Guidelines for BVA ii. Steps in developing test cases using the decision table technique	(7) (6)	Analyze	BTL 4
11	For the current software project, you are working on, answer the following questions: i. List the quality attributes most important to your project. In order to focus on the business functional tests, select no more than six quality attributes from this list as the most functional critical for your system. ii. Why are the selected functional criteria the most critical ones for your system?	(7) (6)	Remember	BTL 1
12	Examine how the parameters of the basic model and the logarithmic model can be determined.	(13)	Apply	BTL 3
13	Discuss the relationship between the correctness and the reliability quality attributes of a software system.	(13)	Understand	BTL2
14	Examine why it may not be possible to satisfy some of the assumptions used in the two models of software reliability.	(13)	Apply	BTL 3

PART – C

Q.No	Questions	BT Level	Competence
1	Using the module hierarchy given in Figure, show the orders of module integration for the top-down and bottom-up integration approaches. Estimate the number of stubs and drivers needed for each approach.	Create	BTL 6

	Specify the integration testing activities that can be done in parallel, assuming you have three SIT engineers. Based on the resource needs and the ability to carry out concurrent SIT activities, which approach would you select for this system and why?		
	<pre> graph TD A[A] --- B[B] A --- C[C] A --- D[D] B --- E[E] B --- F[F] C --- G[G] D --- H[H] D --- I[I] G --- K[K] G --- L[L] H --- M[M] H --- I[I] </pre>		
2	Evaluate the below payment procedure using a decision table and generate test cases from the table. Consider the following description of a payment procedure. Consultants working for more than 40 hours per week are paid at their hourly rate for the first 40 hours and at two times their hourly rate for subsequent hours. Consultants working for less than 40 hours per week are paid for the hours worked at their hourly rates and an absence report is produced. Permanent workers working for less than 40 hours a week are paid their salary and an absence report is produced. Permanent workers working for more than 40 hours a week are paid their salary. We need to.	Evaluate	BTL 5
3	Discuss the similarity between the decision table – based and category partition – based testing methodology.	Create	BTL 6
4	Access for your current test project, develop a taxonomy of system tests that you plan to execute against the implementation	Evaluate	BTL 5

UNIT III - SYSTEM TEST CATEGORIES

System test categories Taxonomy of System Tests, Interface Tests Functionality Tests. GUI Tests, Security Tests Feature Tests, Robustness Tests, Boundary Value Tests Power Cycling Tests Interoperability Tests, Scalability Tests, Stress Tests, Load and Stability Tests, Reliability Tests, Regression Tests, Regulatory Tests.

PART – A

Q. No	Questions	BT Level	Competence
1	Discuss the differences between configuration, compatibility, and interoperability testing?	Understand	BTL2
2	Brief the differences between performance, stress, and scalability testing?	Analyze	BTL 4
3	What are the differences between load testing and stress testing?	Remember	BTL 1
4	What is the difference between performance and speed?	Create	BTL 6
5	Describe security testing.	Understand	BTL2
6	What are the similarities and differences between quality assurance (QA) and safety assurance (SA)?	Remember	BTL 1
7	Explain state-oriented model.	Evaluate	BTL 5
8	List the types of test architectures.	Remember	BTL 1
9	What is meant by Testing with State Verification?	Create	BTL 6
10	Discuss the importance of regression testing.	Understand	BTL2

11	Define finite-state model.	Remember	BTL 1
12	Analyse the Methodology for Testing with State Verification.	Analyze	BTL 4
13	Examine requirement identification.	Apply	BTL 3
14	What are the factors considered during test design?	Remember	BTL 1
15	Discuss briefly about coverage metrics.	Understand	BTL2
16	Define test case design effectiveness.	Remember	BTL 1
17	Summarize the differences between software testability and reliability? What is more important in a software: high testability or	Evaluate	BTL 5
18	Explain the difference between coverage metrics and traceability matrix.	Analyze	BTL 4
19	Why is it important to assign both severity and priority levels to a defect?	Apply	BTL 3
20	Examine the difference between causal analysis and statistical analysis.	Apply	BTL 3

PART-B

PART-B				
1	(i) What are zero-day attacks? (ii) Discuss its significance with respect to security testing.	(13)	Understand	BTL2
2	Discuss briefly about various system test categories.	(13)	Understand	BTL2
3	(i) What are the differences between safety and reliability? (ii) What are the differences between safety testing and security	(7) (6)	Remember	BTL 1
4	(i) Discuss the importance of regression testing when developing a new software release. (ii) What test cases from the test suite would be more useful in	(7) (6)	Understand	BTL2
5	(i) Examine the differences between performance, stress, and scalability testing? (ii) Examine the differences between load testing and stress testing?	(7) (6)	Apply	BTL 3
6	Examine (i) State-Oriented Model. (ii) Finite-State Machine	(7) (6)	Apply	BTL 3
7	Describe briefly about test generation from FSM models.	(13)	Remember	BTL 1
8	Develop state transition model for any two examples.	(13)	Create	BTL 6
9	Explain in detail about test architectures. (i) Local architecture. (ii) Distributed architecture	(7) (6)	Evaluate	BTL 5
10	Describe (i) Transition Tour Method, (ii) Testing with State Verification.	(7) (6)	Remember	BTL 1
11	Explain about the following test architectures. (i) Coordinated architecture. (ii) Remote architecture.	(7) (6)	Analyze	BTL 4

12	Explain in detail about modelling a Test Design Process, Test Design Preparedness metric and test case design effectiveness.	(13)	Analyze	BTL 4
13	Explain about the following (i) Defect Causal Analysis, (ii) Beta testing	(7) (6)	Analyze	BTL 4
14	Describe briefly about (i) system test execution- Modelling Defects, (ii) Metrics for Monitoring Test Execution.	(7) (6)	Remember	BTL 1

PART – C

Q.No	Questions	BT Level	Competence
1.	For your current test project, develop a taxonomy of system tests that you plan to execute against the implementation.	Create	BTL 6
2.	Explain all categories of system test architectures with neat diagrams.	Evaluate	BTL 5
3.	(i) In a software test project, the number of unit-, integration-, and system-level test cases specified are 250, 175, and 235, respectively. The number of test cases added during the unit, integration, and system testing phases are 75, 60, and 35, respectively. Calculate the TCDY for unit, integration, and system testing phases. (ii) Describe briefly about a. System test design and requirement identification b. modelling a Test Design Process.	Evaluate	BTL 5
4.	Develop a set of beta release criteria for your current test project.	Create	BTL 6

UNIT IV - SOFTWARE QUALITY

Software quality - People's Quality Expectations, Frameworks and ISO-9126, McCall's Quality Factors and Criteria – Relationship. Quality Metrics. Quality Characteristics ISO 9000:2000 Software Quality Standard. Maturity models- Test Process Improvement, Testing Maturity Model.

PART – A

Q. No	Questions	BT Level	Competence
1	Discuss the five different views of software quality.	Understand	BTL2
2	Show how one can measure the user's view of software quality.	Apply	BTL 3
3	Define manufacturer's view of software quality.	Remember	BTL 1
4	Explain how one can measure the manufacturer's view of software quality.	Analyze	BTL 4
5	Examine McCall's quality factors.	Apply	BTL 3
6	Explain briefly about McCall's quality criteria.	Evaluate	BTL 5

7	How do measure software quality?	Remember	BTL 1
8	What is mean by Quality?	Remember	BTL 1
9	Develop the people's quality expectations for software systems.	Create	BTL 6
10	What is the relationship between quality, correctness, defects, and quality attributes?	Create	BTL 6
11	List the various software quality models.	Remember	BTL 1
12	What is the relationship between quality, quality assurance, and quality engineering?	Remember	BTL 1
13	Discuss the difference between testing and quality?	Understand	BTL2
14	Define software quality.	Remember	BTL 1
15	Give the quality factors based on McCall's quality model.	Understand	BTL2
16	Explain people's quality expectations.	Analyze	BTL 4
17	Discuss functionality and reliability .	Understand	BTL2
18	Assess Error, fault, failure, and defect.	Evaluate	BTL 5
19	Examine the quality factors of McCall's model.	Apply	BTL 3
20	Explain the factors involved in ISO 9126 model.	Analyze	BTL 4

PART-B

1	Compare McCall's quality model with the ISO 9126 quality model.	(13)	Analyze	BTL 4
2	Describe briefly about i. McCall's categorization of quality factors ii. McCall's quality criteria.	(7) (6)	Remember	BTL 1
3	Explain the ISO 9126 quality characteristics.	(13)	Evaluate	BTL 5
4	Discuss ISO 9000:2000 Fundamental document for quality assurance.	(13)	Understand	BTL2
5	Give any two software quality models and explain with neat diagram.	(13)	Understand	BTL2
6	Describe how one can measure the user's view of software quality.	(13)	Understand	BTL2
7	State some difficulties in applying the McCall and ISO 9126 quality models.	(13)	Remember	BTL 1
8	Define the following terms and give some concrete examples: i. Defect, error, fault failure, accident. ii. What is the relationship among them and What about (software) bugs?	(7) (6)	Remember	BTL 1
9	Briefly explain McCall's categorization of quality factors and quality criteria.	(13)	Analyze	BTL 4
10	Develop ISO 9126 quality model.	(13)	Create	BTL 6
11	Examine i. measure the manufacturer's view of software quality. ii. five different views of software quality	(7) (6)	Apply	BTL 3

12	Briefly explain the ISO 9001:2000 Requirements document for quality assurance.	(13)	Analyze	BTL 4
13	Describe i. ISO 9126 quality model ii. ISO 9001:2000	(7) (6)	Remember	BTL 1
14	Examine McCall's quality factors model with a neat diagram	(13)	Apply	BTL 3

PART – C

Q.No	Questions	BT Level	Competence
1	What is your view of software quality? What is your company's definition of quality?	Create	BTL 6
2	Explain McCall's categorization of quality factors into three quality criteria.	Evaluate	BTL 5
3	Develop the ISO 9001:2000 (Requirements) document for quality assurance.	Create	BTL 6
4	i. Discuss ISO 9126 quality characteristics. ii. Compare McCall's quality model with the ISO 9126 quality model.	Evaluate	BTL 5

UNIT V - SOFTWARE QUALITY ASSURANCE

Quality Assurance - Root Cause Analysis, modelling, technologies, standards and methodologies for defect prevention. Fault Tolerance and Failure Containment - Safety Assurance and Damage Control, Hazard analysis using fault-trees and event-trees. Comparing Quality Assurance Techniques and Activities. QA Monitoring and Measurement, Risk Identification for Quantifiable Quality Improvement. Case Study: FSM-Based Testing of Web-Based Applications.

PART – A

Q. No	Questions	BT Level	Competence
1	What is quality assurance?	Remember	BTL 1
2	What are the different types of QA activities?	Remember	BTL 1
3	Define QA strategy.	Remember	BTL 1
4	Define process maturity levels and discuss their relationship to the quality.	Remember	BTL 1
5	Discuss the purpose of root cause analysis	Understand	BTL2
6	What is the difference between reliability and safety?	Create	BTL 6
7	Define the terms and concepts: accident, hazard.	Remember	BTL 1
8	Explain hazard analysis.	Evaluate	BTL 5

9	What is the impact of fault tolerance on reliability and safety	Create	BTL 6
10	Differentiate decision trees and fault trees.	Analyze	BTL 4
11	Define recovery blocks.	Remember	BTL 1
12	Explain what is meant by FSM..	Evaluate	BTL 5
13	Discuss fault tolerance.	Understand	BTL2
14	Explain fault containment.	Analyze	BTL 4
15	Apply the areas that we can focus to ensure version independence?	Apply	BTL 3
16	Show What is the primary motivation for risk identification?	Apply	BTL 3
17	Examine risks related to software projects from both the internal	Apply	BTL 3
18	Differentiate decision trees and tree-based models?	Understand	BTL2
19	Explain are the modelling techniques to perform multi-analysis?	Analyze	BTL 4
20	Give the relative advantages and disadvantages between tree-based modelling.	Understand	BTL2

PART-B

1.	How would the applicability of different QA alternatives be different when other software processes are used?	(13)	Analyze	BTL 4
2.	Compare both the entry and exit levels of quality for individual QA alternatives. That is, what is the defect level before and after applying these specific QA alternatives.	(13)	Evaluate	BTL 5
3.	Explain briefly about i. Fault tolerance ii. Fault containment	(7) (6)	Analyze	BTL 4
4.	Describe briefly about i. Measurement of direct quality ii. Measurement of indirect quality	(7) (6)	Remember	BTL 1
5.	Develop the Algorithm for tree-based model construction.	(13)	Create	BTL 6
6.	Discuss in detail about fault tolerance with i. Recovery blocks ii. N-version programming	(7) (6)	Understand	BTL2
7.	Discuss the algorithm i. Optimal set reduction ii. Pattern recognition	(7) (6)	Understand	BTL2
8.	Describe in detail about NVP basic technique and implementation.	(13)	Understand	BTL2
9.	Describe the advantage and disadvantages of the following i. Tree-based modelling ii. Optimal set reduction.	(7) (6)	Remember	BTL 1
10.	Describe in detail about defect management based on fault tolerance.	(13)	Remember	BTL 1
11.	Apply Tree-based defect model for a commercial product.	(13)	Apply	BTL 3
12.	Explain risk identification for classified defect data.	(13)	Analyze	BTL 4
13.	i. What are the characteristics of web problems? ii. Describe briefly about FSMs for web testing.	(7) (6)	Remember	BTL 1

14.	Examine in detail about the case study: FSM-based testing of web-based applications.	(13)	Apply	BTL 3
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PART – C

Q. No	Questions	BT Level	Competence
1	Explain the purpose of root cause analysis? Does it have a strong impact on your software quality?	Evaluate	BTL 5
2	Explain in detail with neat diagrams i. Fault tolerance ii. Fault containment	Evaluate	BTL 5
3	Consider the specific application environment in your organization, how would different QA alternatives compare? In addition, is cost a critical factor in your market segment? How would it affect the choice of different QA alternatives for your products?	Create	BTL 6
4	Develop and Compare the relative advantages and disadvantages between tree-based modelling and optimal set reduction.	Create	BTL 6

