

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025

Third Semester

Master of Computer Applications

MC4026 - Software Quality and Testing

Regulations - 2021

Duration : 3 Hrs

Maximum: 100 Marks

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	Questions	BLT	CO	Marks
1.	Define Unit testing.	L1	1	2
2.	What is a "basic block" in control flow testing?	L1	1	2
3.	List any two key components of a Software Test Plan.	L1	2	2
4.	What is meant by the term "Test Objective" in a test plan?	L1	2	2
5.	Name two benefits of using modern software testing tools.	L1	3	2
6.	What are the different Methodologies in Agile Development Model?	L2	3	2
7.	Define the term "Quality Control".	L1	4	2
8.	Differentiate between verification and validation in software testing.	L2	4	2
9.	What is the significance of the "Check" step in the PDCA cycle?	L2	5	2
10.	List any two of Deming's Quality Principles and their importance in software quality.	L1	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No	Questions	BLT	CO	Marks
11. a	A company has a function in its software that calculates discount rates based on a customer's loyalty level. The function has various conditional statements: - If the customer has been a member for more than five years, they receive a 20% discount. - If the customer has made purchases over \$5,000 in the past year, they receive a 15% discount. - If both conditions are met, the discount is 25%. - Otherwise, the discount is 10% Draw the control flow graph for this function, and identify all possible execution paths. Create test cases for each path to ensure that each condition and combination of conditions is tested. Explain why testing all paths is necessary for this function.	L4	1	16

Or

	b i	Demonstrate how you would apply the unit testing process to test a function that calculates the factorial of a number. Describe the steps involved and outline test cases that cover both valid and edge inputs.	L3	1	8
	ii	100% branch coverage leads to 100% statement coverage. Analyse and Justify your answer.	L4	1	8
12.	a i	A client has raised concerns about the security of a newly developed application. How would you apply static and dynamic testing techniques to address these concerns and mention specific security testing practices would you recommend.	L3	2	8
	ii	Explain how software testing in the spiral manner differs from traditional models. Analyze how testing in each iteration of the spiral model affects test planning, coverage, and evaluation.	L4	2	8
Or					
	b i	In a case study of a payroll management system, it was found that several high-priority defects were missed during testing due to insufficient test coverage. Analyze possible reasons for this gap in test coverage and suggest a revised approach that would prevent similar issues in future releases.	L4	2	8
	ii	An online learning platform has recently undergone performance testing to assess its scalability in anticipation of a large influx of users. The results show that the platform can handle 500 concurrent users but begins to slow down significantly beyond that threshold. You are asked to prepare a summary report for the technical team to guide further optimizations. What specific data points would you include in your summary, and what strategies would you recommend for improving performance?	L3	2	8
13.	a i	Discuss the common challenges faced during test process assessments. Explain how these challenges be mitigated to ensure a successful assessment outcome.	L2	3	8
	ii	Compare and contrast different types of test automation frameworks (e.g., keyword-driven, data-driven, behavior-driven).	L4	3	8
Or					
	b i	Describe the key features and advantages of two modern software testing tools used for functional and non-functional testing. Explain how these tools enhance the efficiency and effectiveness of testing processes.	L2	3	8
	ii	A team has just transitioned to Agile methodologies and is struggling with integrating testing into their sprints. Apply Agile Testing	L3	3	8

principles to design a testing approach that aligns with their current sprint cycle.

14.	a	i	What is Software Quality Assurance(SQA) plan? Illustrate the various activities involved in SQA plan.	L2	4	8
		ii	Analyze the impact of a well-defined SQA Plan on the overall success of a software project. Discuss the potential risks of not having a comprehensive SQA Plan in place in terms of project outcomes, including timelines, costs, and customer satisfaction.	L4	4	8
			Or			
	b	i	Compare and contrast 'CMMI' and 'The People CMM' with respect to level, focus and process areas.	L4	4	8
		ii	Discuss how the Malcolm Baldrige National Quality Award can serve as a framework for continuous improvement in organizations.	L2	4	8
15.	a	i	Explain how statistical methods can be used to identify and reduce software defects.	L2	5	8
		ii	You are given a requirement for a login feature that states, "Users must be able to log in using their email and password." Analyze this requirement and create three test cases to verify its functionality. Include both valid and invalid scenarios.	L4	5	8
			Or			
	b	i	A manufacturing company is facing high defect rates in its products. Apply Deming's Principle of Continuous Improvement (Plan-Do-Check-Act) to identify the root causes of defects and implement solutions. Provide a step-by-step approach.	L3	5	8
		ii	A small manufacturing company is facing delays in its production schedule. Analyze the current situation using the PDCA cycle. Describe how you would implement each phase of PDCA to address the delays and improve the production process.	L4	5	8