Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – MAY 2025

Date: 23-05-2025 **Time:** 01:00 pm –04:00 pm

School: SOIS	**Program:** BCA	
Course Code: CSA2010	**Course Name:** Software Testing	
Semester: IV	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**37.8**	**31.1**	**31.1**	**-**	**-**

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	What is the Waterfall model in software development? Mention one major drawback of this model.	**2 Marks**	**L1**	**CO1**
2.	What is the Agile model and how does it improve upon traditional models like Waterfall?	**2 Marks**	**L1**	**CO1**
3.	What is the purpose of test case development and what factors influence it?	**2 Marks**	**L1**	**CO1**
4.	What is boundary value analysis and why is it important?	**2 Marks**	**L1**	**CO1**
5.	What are the essential elements of a good test case template?	**2 Marks**	**L1**	**CO2**
6.	State the process of test case execution and its importance.	**2 Marks**	**L1**	**CO2**
7.	What is the role of a bug report in software testing? What key information should it include?	**2 Marks**	**L1**	**CO2**
8.	How can software test automation benefit a project?	**2 Marks**	**L1**	**CO3**
9.	Mention two common challenges encountered in implementing software test automation.	**2 Marks**	**L1**	**CO3**
10.	Define software testing metrics. How do they help in evaluating software quality?	**2 Marks**	**L1**	**CO3**

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	Examine the commission problem through the lens of boundary value testing. Identify and derive various test cases based on boundary conditions, execute these test cases, and analyze the test results to evaluate the effectiveness of the boundary value approach.	**10 Marks**	**L4**	**CO1**
	b.	Analyze the significance of Regression Testing in the software development lifecycle. How does it help maintain software quality during ongoing incremental changes or updates? Explore the challenges faced in regression testing and outline strategies for effectively implementing it, particularly in Agile environments.	**10 Marks**	**L4**	**CO1**
		Or			
12.	**a.**	By writing a program in an appropriate programming language to implement a letter grading system, making necessary assumptions. Identify the basis paths in the program and use them to derive different test cases. Execute these test cases and analyze the results to evaluate the program's functionality.	**10 Marks**	**L2**	**CO1**
	b.	Describe the Rapid Application Development (RAD) model, focusing on its advantages in terms of speed, flexibility, and the ability to accommodate changes during development. In which types of projects is this model most effective, and what makes it suitable for those projects?	**10 Marks**	**L2**	**CO1**

13.	**a.**	Design boundary value test cases for a Pizza Delivery App where the valid number of pizzas that can be ordered ranges from 1 to 10. For any value between 11 and 99, the app displays an error message stating, "Only 10 pizzas can be ordered." Identify test cases based on boundary values and explain the expected results for each scenario**.**	**10 Marks**	**L3**	**CO1**
	b.	A healthcare provider is launching a new mobile health app that enables users to securely track their medical records, schedule appointments, and access health advice. As part of the quality assurance process, test cases must be developed to validate the following features: • User Login with Authentication • Viewing Health Records • Scheduling a Medical Appointment For each of these features, define at least two test cases, covering both valid and invalid scenarios. Your test cases should include the following components: • Test Case ID • Test Scenario • Preconditions • Test Steps	**10 Marks**	**L2**	**CO2**

		• Expected Result • Actual Result			
		Or			
14.	**a.**	Describe the various STLC phases and explain how it helps in improving software quality and defect detection.	**10 Marks**	**L2**	**CO1**
	b.	A mid-sized software company is developing a customer relationship management (CRM) tool for a retail chain. As the testing phase progresses, the management team wants to evaluate the effectiveness and quality of the testing process. The QA team decides to use software testing metrics to gather insights into the quality of the software and the efficiency of the testing team. Based on this scenario: Explain what software testing metrics are, and describe how metrics such as defect density, test case effectiveness, and defect leakage can be used to assess the quality of the software and the testing process. Include examples of each metric and explain why they are important in decision-making during software development and release.	**10 Marks**	**L2**	**CO3**

15.	**a.**	Explain Black Box Testing in detail, including its techniques, advantages, and examples.	**10 Marks**	**L2**	**CO2**
	b.	Design and explain a program that solves the triangle classification problem. The program should take three integers as inputs, representing the sides of a triangle, and classify the triangle based on the following conditions: • Equilateral Triangle: All three sides are equal. • Isosceles Triangle: Exactly two sides are equal. • Scalene Triangle: All three sides are different. • Not a Triangle: The three sides do not satisfy the triangle inequality theorem (i.e., the sum of any two sides must be greater than the third side). Additionally, discuss the process of deriving test cases using the Decision Table approach to ensure the correctness of the program. Provide a explanation of how each condition is checked and executed, and how the decision table helps in covering all possible scenarios.	**10 Marks**	**L3**	**CO2**
		Or			
16.	**a.**	Explain Boundary Value Analysis (BVA) with a suitable scenario. Consider a driving license application system where the valid age range is 18 to 60 years. Identify test cases using BVA and explain the expected outcomes. Applying BVA: • Lower Boundary Values: 17 (invalid), 18 (valid - minimum boundary), 19 (valid)	**10 Marks**	**L2**	**CO2**

		• Upper Boundary Values: 59 (valid), 60 (valid - maximum boundary), 61 (invalid)			
	b.	Describe four different White Box Testing techniques that address the following aspects: 1. Executing every line of code at least once. 2. Checking all possible outcomes of decision-making statements. 3. Testing loop structures under different conditions. 4. Ensuring all possible execution paths in the program are tested. For each technique, provide an explanation, an example test case, and its significance in improving software quality.	**10 Marks**	**L2**	**CO2**

17.	**a.**	Discuss the various stages of the Defect Life Cycle in detail. Explain how defects are tracked, managed, and closed, with examples of activities at each stage.	**10 Marks**	**L2**	**CO3**
	b.	Describe the advantages and challenges of implementing software test automation in a software development life cycle. Include examples of tools used for automation and the types of tests that benefit from automation.	**10 Marks**	**L2**	**CO3**
		Or			
18.	**a.**	Explain the importance of writing good bug reports in software testing. Discuss the steps involved in writing effective bug reports, and give an example of a detailed bug report.	**10 Marks**	**L2**	**CO3**
	b.	What are software testing metrics, and how do they help in assessing the quality of software? Discuss the importance of metrics like defect density, test case effectiveness, and defect leakage.	**10 Marks**	**L2**	**CO3**