COMSATS University Islamabad
Sahiwal Campus
(Department of Computer Science)

Course Title:	*Software Engineering*			***Course Code:***	*CSC291*	***Credit Hours:***	*3*
Course Instructor:	*Ms. Sameen Fatima*			***Programme Name:***	*Bachelor of Science in CS_____*		
Semester:	*3rd*	***Batch:***	***Section:***	*G*	***Date:***	*9-12-2025*	
Time Allowed:				***Maximum Marks:***			
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CLOs Addressed	*CLO1*		*CLO2*		*CLO3*	
	Question Nos.	***Max. Marks.***	***Question Nos.***	***Max. Marks.***	***Question Nos.***	***Max. Marks.***
					1	*5*

Important Instructions / Guidelines:

Read the question paper carefully and answer the questions according to their statements.

Mobile phones are not allowed. Calculators must not have any data/equations etc. in their memory.

Assignment # 4

Q # 1.

***CLO 4**: "Apply software testing and quality assurance techniques to medium sized software."*

What is a Test Case? How do we design a test case? What are different testing strategies? Explain whether such strategies are applied in software testing or not.

What is a Test Case?

A test case is a written document that describes how a specific part of software should be tested. It includes the input values, the steps to perform, the conditions before the test, and the expected output.
In simple words, a test case explains what to test, how to test it, and what result should be obtained. It helps ensure that the software works correctly and the same test can be repeated in the future.

How Do We Design a Test Case?

Designing a test case involves the following steps:

1. *Understand Requirements*
   - *Read the software requirements and identify what feature needs to be tested.*
2. *Identify Inputs and Expected Results*
   - *Choose valid inputs to check correct behavior and invalid inputs to check error handling.*
   - *Clearly define what the expected output should be.*
3. *Write Testing Steps*
   - *List the steps to be followed during testing, including preconditions (e.g., user login, system ready).*
4. *Consider Edge Cases*
   - *Test on boundary values, unusual inputs, or error conditions to ensure software stability.*
5. *Document the Test Case*
   - *Give a Test Case ID, description, steps, input data, expected output, and space for actual output and pass/fail status.*

Well-designed test cases improve quality, reduce mistakes, and make testing systematic.

Different Testing Strategies

1. Black-Box Testing

- *The tester checks the system without knowing internal code.*

- *Focus is on inputs, outputs, and user-visible behavior.*

2. White-Box Testing

- *The tester has knowledge of internal code and logic.*
- *Used to test paths, loops, branches, and internal structure.*

3. Gray-Box Testing

- *Combination of black-box and white-box testing.*
- *Tester has partial knowledge of inner working.*

4. Levels of Testing

- *Unit Testing: Testing individual modules.*
- *Integration Testing: Testing combined modules.*
- *System Testing: Testing the complete system.*
- *Acceptance Testing: Checking if the system meets customer needs.*
- *Regression Testing: Ensuring new changes do not break old functionality.*

Are These Strategies Applied in Software Testing?

Yes, these strategies are commonly used in real-world software development:

- *Black-box testing is used by QA teams to check functionality.*
- *White-box testing is used by developers to test internal logic.*
- *Integration, system, and acceptance testing are used before delivering the product.*
- *Regression testing is always performed after updates or bug fixes.*

These strategies help ensure that medium-sized software works correctly, is stable, meets requirements, and maintains quality over time.

The End