Q:1:- Software Testing Techniques:

- Understanding different testing techniques,such as black-box testing and white- box testing?

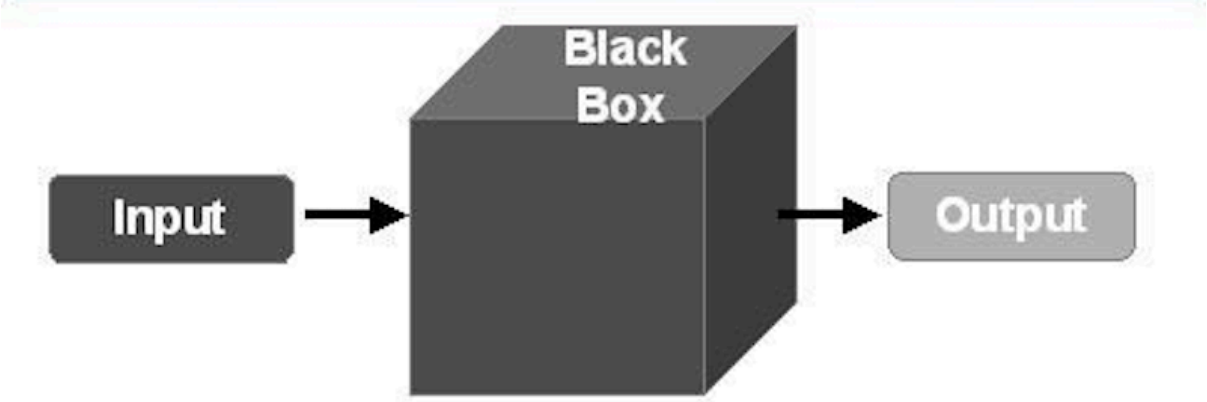
Ans:- **Software Testing Techniques:**

Software testing is a critical phase of the software development lifecycle, ensuring the quality and reliability of the final product. There are various techniques employed to identify defects and validate functionality.

In the field of software testing, some methods are used to find defects and evaluate the quality of the product. Among them are **White-Box Testing** and **Black-Box Testing**.

What is Black Box Testing?

Black Box Testing is the method that does not consider the internal structure, design, and product implementation to be tested. In other words, the tester does not know its internal functioning. The Black Box only evaluates the external behaviour of the system. The inputs received by the system and the outputs or responses it produces are tested.



Key Characteristics:

1. **Functional testing:** Verifies if the software performs its intended functions correctly.

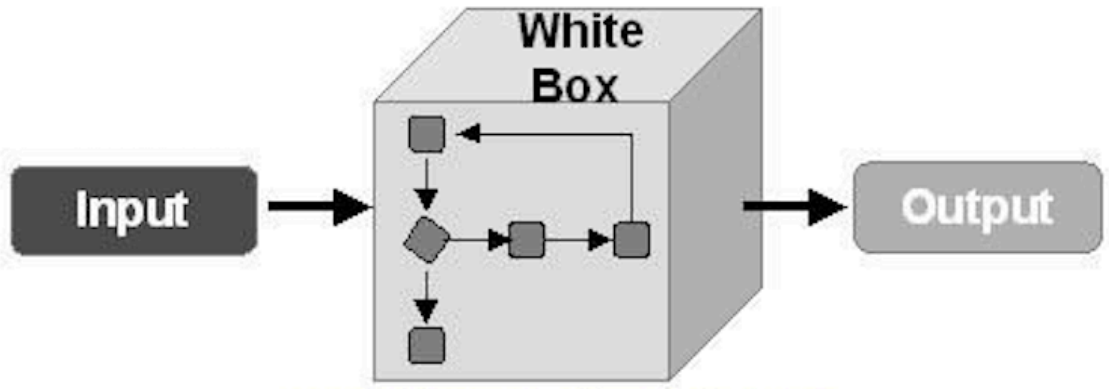
Non-functional testing: Evaluates aspects like performance, usability, security, and compatibility.

Examples:

1. Equivalence partitioning: Divides input data into valid and invalid equivalence classes.
2. Boundary value analysis: Tests data at the boundaries of input ranges.
3. Decision table testing: Creates decision tables to cover all possible combinations of input conditions.

What is White Box Testing?

The White Box Test method is the one that looks at the code and structure of the product to be tested and uses that knowledge to perform the tests. This method is used in the Unit Testing phase, although it can also occur in other stages such as Integration Test. For the execution of this method, the tester or the person who will use this method must have extensive knowledge of the technology used to develop the program.



Key Characteristics:

2. Structural testing: Ensures that all code paths are executed.
3. Code coverage: Measures the percentage of code that has been tested.

Examples:

1. Statement coverage: Ensures that every statement in the code is executed at least once.
2. Branch coverage: Ensures that every branch or decision point in the code is executed at least once.
3. Path coverage: Ensures that every possible path through the code is executed at least once.

Black Box Vs White Box Testing

	Black Box Testing	White Box Testing
Description	The Black Box Test is a test that only considers the external behaviour of the system; the internal workings of the software are not taken into account.	The White Box Test is a method used to test software taking into consideration its internal functioning.
Executed By	It is carried out by testers.	It is carried out by software developers.
Testing Phase	This method is used in System Testing or Acceptance Testing.	This method is used in Unit Testing or Integration Testing.
Time Consumption	It is the least time consuming.	It is most time consuming.
Testing Focus	It is the behaviour testing of the software.	It is the logic testing of the software.
Aliases	It is also known as data-driven testing, functional testing, and closed box testing.	It is also known as clear box testing, code-based testing, structural testing, and transparent testing.
Suitability for Algorithm Testing	Black Box Test is not considered for algorithm testing	White Box Test is well suitable for algorithm testing.

Key Differences

1. Black Box Test only considers the system's external behaviour, while White Box Test considers its internal functioning.
2. Implementation knowledge is not required when applying Black Box Testing, unlike White Box Test.
3. It takes less time to perform Black Box Testing than White Box Testing.