UNIT IV –LIFE CYCLE BASED TESTING

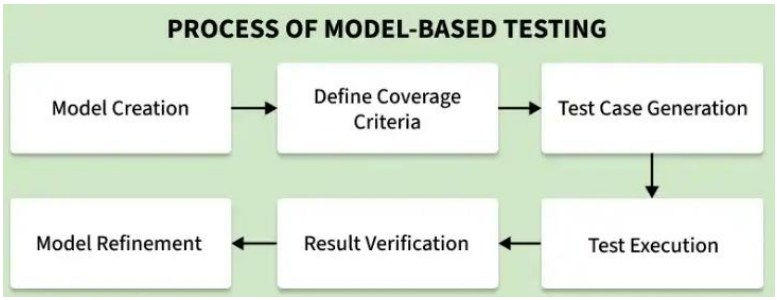
Life Cycle Based Traditional Waterfall Testing, Testing in Iterative Life Cycles, Agile Testing, Agile Model–Driven Development - Model-Based testing: Testing Based on Models - Integration Testing: Decomposition-Based Integration, Call Graph–Based Integration.

Model-Based Testing (MBT)

Model-Based Testing (MBT) is a software testing technique in which test cases are created using models that describe how a system should behave. It helps testers achieve better test coverage, maintain consistency, and reduce the amount of manual testing work.

Key Points

- Uses different models: Models such as Finite State Machines (FSM), UML diagrams, and Statecharts can be used to represent system behavior.
- Generates test cases: Test cases can be created automatically or with some manual assistance from the models.
- Better test coverage: It helps test more possible system behaviors and scenarios.
- Less manual effort: Automated test generation reduces the time and effort required to create test cases manually.



Process of Model-Based Testing

1. **Create the Model:**
   Requirements, user stories, and expected system behavior are transformed into a model such as **FSM, EFSM, or UML diagrams**. This model describes how the system is expected to work.

2. **Set Testing Criteria:**
   The required level of testing is decided by defining criteria such as **state coverage, transition coverage, and path coverage**.

3. **Generate Test Cases:**
   Test cases are created from the model either **automatically or semi-automatically** using different algorithms and model-traversal methods.

4. **Execute the Tests:**
   The generated test cases are run on the **actual software system** with the help of testing tools

or automation frameworks.

5. **Check the Results:**
   The actual results produced by the system are compared with the **expected results from the model**. Any difference can indicate a defect.

6. **Improve the Model:**
   When errors or differences are discovered, the model is modified or improved. This makes future testing more accurate and helps increase test coverage.