



SOFTWARE TESTING BASICS

TechRacine Solutions Academy

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Study Guide

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Introduction to Software Testing

Software Testing is the process of verifying and validating software applications.

Testing ensures that applications work correctly and meet business requirements.

The main goal of testing is to identify defects before software reaches users.

Software testing improves software quality, stability, and reliability.

Importance of Software Testing

Testing helps reduce software failures and production issues.

It improves customer satisfaction and software quality.

Testing identifies bugs, security vulnerabilities, and usability problems.

Proper testing saves development and maintenance costs.

Software Development Life Cycle

SDLC stands for Software Development Life Cycle.

It defines the stages involved in software development.

Common SDLC phases include Requirement Analysis, Design, Development, Testing, Deployment, and Maintenance.

Testing is an important phase of SDLC.

Software Testing Life Cycle

STLC stands for Software Testing Life Cycle.

It defines testing activities performed during software projects.

STLC phases include Requirement Analysis, Test Planning, Test Case Design, Environment Setup, Test Execution, and Test Closure.

Types of Testing

Software testing contains multiple testing types.

1. Manual Testing
2. Automation Testing
3. Functional Testing
4. Non-Functional Testing
5. Regression Testing
6. API Testing
7. Performance Testing
8. Security Testing

Manual Testing

Manual testing is performed without automation tools.

Testers manually execute test cases and validate application behavior.

Manual testing is commonly used in UI and usability testing.

Automation Testing

Automation testing uses tools and scripts to execute test cases automatically.

Automation improves testing speed and efficiency.

Automation is useful for repetitive testing tasks.

Example Tools:

Selenium
Playwright
Cypress

Functional Testing

Functional testing validates application functionality.

It checks whether software works according to requirements.

Login, registration, search, and CRUD operations are commonly tested.

Non-Functional Testing

Non-functional testing validates performance, security, usability, and scalability.

This testing ensures applications perform properly under real-world conditions.

Test Cases and Test Scenarios

Test scenarios define what should be tested.

Test cases contain detailed testing steps.

Good test cases improve testing quality and coverage.

Test Case Example:

```
Test Case ID : TC001
Module      : Login
Expected    : User should login successfully
```

Bug Life Cycle

A bug life cycle defines stages of a software defect.

Common statuses include New, Assigned, Open, Fixed, Retest, Verified, and Closed.

Bug tracking helps development teams manage issues efficiently.

Severity and Priority

Severity defines how serious a defect is.

Priority defines how quickly the defect should be fixed.

Critical production issues usually have high severity and high priority.

Smoke and Sanity Testing

Smoke testing validates basic application stability.

Sanity testing validates specific functionality after fixes.

These testing types help identify major issues quickly.

Regression Testing

Regression testing ensures existing features work after code changes.

Regression testing is important after bug fixes and enhancements.

Automation testing is commonly used for regression testing.

API Testing

API testing validates backend services and APIs.

It checks requests, responses, status codes, and validations.

API testing is important in modern web and mobile applications.

```
GET /api/students
```

```
Status Code : 200 OK
```

Testing Tools

Many testing tools are available for software testing.

1. Selenium
2. Postman
3. JMeter
4. TestRail
5. Playwright

6. Cypress

7. Azure DevOps

Basic SQL for Testers

Testers often use SQL queries to validate database data.

Understanding basic SQL improves backend testing.

```
SELECT * FROM students;
```

```
SELECT * FROM users  
WHERE status='Active';
```

Best Practices

Write clear and reusable test cases.

Understand business requirements properly.

Test edge cases and validations.

Report bugs clearly with screenshots.

Maintain proper testing documentation.

Collaborate effectively with developers.

Career Opportunities in Testing

Software testing provides strong career opportunities.

Testing roles include QA Engineer, Automation Tester, Performance Tester, and QA Lead.

Testing professionals are important in all software companies.

Summary

Software testing is an essential part of software development.

Testing improves software quality, reliability, and user satisfaction.

Understanding testing concepts, tools, and workflows is important for modern software projects.

Software testing provides excellent career opportunities in the IT industry.

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