**Types of Manual testing:**

### ****1. Black Box Testing****

**Checks app without looking at code.**  
Example: Enter numbers in a calculator and check the result.

### ****2. White Box Testing****

**Tests the internal logic and code.**  
Example: Developer tests if if-else works correctly.

### ****3. Gray Box Testing****

**Tester knows some code but tests like a user.**  
Example: Tester uses knowledge of database while testing login.

### ****4. Unit Testing****

**Tests one small part (function) of code.**  
Example: Check if validateLogin() gives correct output.

### ****5. Integration Testing****

**Tests if modules work well together.**  
Example: Check if login connects to dashboard.

### ****6. System Testing****

**Tests the full system from start to end.**  
Example: Search product → buy → payment.

### ****7. User Acceptance Testing (UAT)****

**User checks if software meets their needs.**  
Example: Restaurant owner tests food order app.

### ****8. Smoke Testing****

**Quick basic test to see if app runs.**  
Example: Open app → login → see home screen.

### ****9. Sanity Testing****

**Check if a small change didn’t break anything.**  
Example: Test only the password reset after fix.

### ****10. Regression Testing****

**Check old features after updates.**  
Example: After adding search, test login again.

### ****11. Exploratory Testing****

**Tester freely explores the app.**  
Example: Randomly click buttons to find bugs.

### ****12. Ad-Hoc Testing****

**Informal testing without planning.**  
Example: Test quickly just before release.

### ****13. Alpha Testing****

**Testing done by internal team.**  
Example: Company staff tests the app before users.

### ****14. Beta Testing****

**Testing by real users before launch.**  
Example: Users try chat app in beta version.

### ****15. Interface Testing****

**Tests data flow between systems.**  
Example: Check app → payment gateway connection.

### ****16. Compatibility Testing****

**Tests app on different devices and browsers.**  
Example: Check if app works on Android and iPhone.

### ****17. Usability Testing****

**Check if app is easy to use.**  
Example: See if "Sign Up" is easy to find.

### ****18. Performance Testing****

**Test app speed and response.**  
Example: Open 10 tabs and check if app slows down.

### ****19. Installation Testing****

**Tests app installation and uninstallation.**  
Example: Install and uninstall app on multiple devices.

### ****20. Recovery Testing****

**Check if app recovers after crash.**  
Example: Force close app and check if it resumes.

### ****21. Security Testing****

**Test for weak spots and attacks.**  
Example: Try logging in with SQL injection.

### ****22. Localization Testing****

**Check app in local language and format.**  
Example: Urdu language text displays correctly.

### ****23. Globalization Testing****

**App should work globally with different settings.**  
Example: Date format changes based on country.

### ****24. GUI Testing****

**Check visual parts like buttons and forms.**  
Example: Is the “Submit” button visible and clickable?

**Types of automation testing**

### ****1. Unit Testing****

**Tests one small piece of code (like a function).**  
Example: Check if calculateTotal() gives the correct result.

### ****2. Integration Testing****

**Tests if two parts of the app work together.**  
Example: Login should take you to your profile page.

### ****3. Functional Testing****

**Tests if each feature works properly.**  
Example: Check if login and signup buttons work.

### ****4. Smoke Testing****

**Quick test to check if the app runs at all.**  
Example: Open app → check if home, login, and dashboard open.

### ****5. Sanity Testing****

**Check small changes didn’t break anything.**  
Example: After fixing reset password, test only that.

### ****6. Regression Testing****

**Check old features after new updates.**  
Example: After adding search, test if login still works.

### ****7. End-to-End Testing (E2E)****

**Test the full user journey from start to end.**  
Example: Login → search → buy → pay → logout.

### ****8. Load Testing****

**Check how app works with many users.**  
Example: Simulate 500 users logging in at once.

### ****9. Stress Testing****

**Push app to its limit to see when it breaks.**  
Example: Add 1000 users at once to crash the system.

### ****10. Performance Testing****

**Check how fast the app works.**  
Example: Measure how long homepage takes to load.

### ****11. API Testing****

**Tests the backend (APIs).**  
Example: Test if a request returns correct user data.

### ****12. UI Testing (GUI)****

**Test buttons, forms, and screen elements.**  
Example: Check if the “Sign Up” button works.

### ****13. Cross-Browser Testing****

**Test the app in different browsers.**  
Example: See if site works on Chrome and Firefox.

### ****14. Cross-Platform Testing****

**Test the app on different devices and OS.**  
Example: Check app on Android and iPhone.

### ****15. Data-Driven Testing****

**Run same test with many data sets.**  
Example: Test login with 50 different usernames.

### ****16. Keyword-Driven Testing****

**Use action words (like “Click”, “Enter”) to control tests.**  
Example: A file says "Click login" and automation does it.

### ****17. BDD Testing (Behavior-Driven)****

**Write tests in plain language (like English).**  
Example: "Given I’m on login page, When I login, Then show dashboard."

### ****18. Continuous Testing (CI/CD)****

**Auto-tests run whenever new code is added.**  
Example: All tests run when a developer saves new code.

### ****19. Mobile App Testing****

**Automate testing on mobile apps.**  
Example: Open app → click → check if it works.

### ****20. Database Testing****

**Check if data is saved correctly.**  
Example: After signup, check user info in database.

### ****21. Installation Testing****

**Test if the app installs and uninstalls properly.**  
Example: See if app installs on Android and iOS.

### ****22. Security Testing****

**Check for security risks (partially automated).**  
Example: Scan for login hacks like SQL injection.

**Black Box Testing types:**

### ****1. Functional Testing****

**Check if each feature works properly.**  
Example: Test login form with correct and wrong inputs.

### ****2. Non-Functional Testing****

**Check app speed, look, and feel — not just functions.**  
Example: Is the app fast and easy to use?

### ****3. Regression Testing****

**Check old features after updates.**  
Example: After adding search, check if signup still works.

### ****4. Smoke Testing****

**Quick check if main features work after a new build.**  
Example: Open app and see if home and login work.

### ****5. Sanity Testing****

**Check only the changed part after a small fix.**  
Example: Only test login after fixing login issue.

### ****6. User Acceptance Testing (UAT)****

**Real users test to confirm the app meets their needs.**  
Example: Customer checks if food delivery app works as they want.

### ****7. Compatibility Testing****

**Check if app works on different devices/browsers.**  
Example: Test on both Chrome and Safari.

### ****8. Usability Testing****

**Check if the app is easy to use.**  
Example: Is the “Add to Cart” button easy to find?

### ****9. Performance Testing****

**Check how fast and stable the app is.**  
Example: Does app slow down with many users?

### ****10. Load Testing****

**Check how much traffic or data the app can handle.**  
Example: Can 100 users shop at once?

### ****11. Stress Testing****

**Push app beyond its limits to see what happens.**  
Example: What if 1000 users log in at once?

### ****12. Volume Testing****

**Test with a huge amount of data.**  
Example: Add 1 million records and check performance.

### ****13. Security Testing****

**Check if app is safe from hackers.**  
Example: Try SQL injection in the login field.

### ****14. Interface Testing****

**Check if different systems talk to each other correctly.**  
Example: Does the app send payment info properly to the bank?

### ****15. Localization Testing****

**Check if app works in other languages.**  
Example: Does Urdu text show up correctly?

### ****16. Globalization Testing****

**Check if app supports different languages, currencies, and formats.**  
Example: Does app show ₹ in India and $ in USA?

### ****17. Exploratory Testing****

**Testers randomly try things without a plan.**  
Example: Click around the app to find hidden bugs.

**White Box Testing types:**

### ****1. Unit Testing****

**Check if one function or method works correctly.**  
Example: Does add(2, 3) give 5?

### ****2. Integration Testing****

**Check if two or more parts of code work together.**  
Example: Does login take you to dashboard properly?

### ****3. Code Coverage Testing****

**Check how much of the code is tested.**  
Example: Have you tested all lines, conditions, and paths?

#### ****3.1 Statement Coverage****

**Test every line of code at least once.**  
Example: All 10 lines in a function should run during testing.

#### ****3.2 Branch Coverage****

**Test all if/else decisions.**  
Example: Test both sides of an if (a > b) condition.

#### ****3.3 Condition Coverage****

**Test all true/false combinations in a condition.**  
Example: Try all combos of a > 5 && b < 10.

#### ****3.4 Path Coverage****

**Test every possible path in code.**  
Example: Test all routes through ifs and loops.

#### ****3.5 Loop Coverage****

**Test loops with different counts.**  
Example: Run loop 0, 1, and many times.

### ****4. Control Flow Testing****

**Check how code moves from one step to another.**  
Example: Test all arrows in a flowchart of the code.

### ****5. Data Flow Testing****

**Track how variables are used in code.**  
Example: Is a variable used before it's given a value?

### ****6. Mutation Testing****

**Make small errors in code to test your test cases.**  
Example: Change + to - and see if the test fails.

### ****7. Basis Path Testing****

**Test all possible paths in code using flow graphs.**  
Example: Cover each path based on decisions in the function.

### ****8. Security Testing (White-box)****

**Check inside code for security holes.**  
Example: Look for hardcoded passwords or open SQL queries.

### ****9. Fault Injection Testing****

**Put fake errors in code and see how it reacts.**  
Example: Force an error to test crash handling.

**Levels of testing:**

· **Unit Testing** – Check if each small part (like a function or method) works properly.

· **Integration Testing** – See if connected parts work well together.

· **System Testing** – Test the whole system to make sure everything works fine.

· **Acceptance Testing** – Check if the system meets the user’s needs and is ready to use.