**Chapter 13 - Time for the Test**

**1️⃣ What are the different types of Testing?**

**Definition (what):**  
Testing = verifying that code behaves as expected.

**Types (common in frontend & React apps):**

1. **Unit Testing** → Test a single function/component in isolation.  
   Example: test if add(2,3) returns 5.
2. **Integration Testing** → Test multiple modules working together.  
   Example: check if LoginForm calls API and updates UI.
3. **End-to-End (E2E) Testing** → Test the whole app as a user would, using tools like Cypress/Playwright.  
   Example: simulate logging in and adding item to cart.
4. **Manual Testing** → Human tester clicks and checks features.
5. **Automation Testing** → Scripts auto-run tests whenever code changes.

✅ **Interview line**:  
“Unit tests check small pieces, integration tests check modules together, and end-to-end tests check the whole app flow. In React, we often use Jest for unit/integration tests and Cypress for E2E.”

**2️⃣ React Testing Library and Its Setup**

**What:**  
React Testing Library (RTL) is a lightweight library for testing React components by simulating how a user interacts with them.

**Why:**

* Focuses on *testing behavior*, not implementation details.
* Encourages writing tests that resemble real user interactions.

**Setup (basic steps):**

* Comes preinstalled in create-react-app.
* If not, install:
* npm install @testing-library/react @testing-library/jest-dom

**Example test:**

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✅ **Interview line**:  
“React Testing Library tests React components from the user’s perspective, using queries like getByText and simulating interactions.”

**3️⃣ What is Jest and why do we use it?**

**What:**  
Jest is a JavaScript testing framework by Facebook, bundled with features like

test runner, assertions, mocking, and coverage.

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**Why:**

* Works seamlessly with React.
* Fast, easy to set up.
* Handles both unit and integration tests.

**Interview line:**  
“Jest is the default test runner for React projects. It’s used because it’s fast, has built-in mocking, and integrates well with React Testing Library.”

**4️⃣ Jest setup and installation of its related**

**If using Create React App:**

* Jest is already included → no setup needed.

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**Optional tools:**

* @testing-library/jest-dom → for DOM matchers (toBeInTheDocument)
* babel-jest → for compiling modern JS/JSX

✅ **Final Interview Summary for Chapter 13:**

* *“There are unit, integration, and E2E tests.”*
* *“We use React Testing Library for testing components via user interactions.”*
* *“Jest is the default test runner for React, great for unit & integration tests.”*
* *“With CRA, Jest is pre-installed. For custom setup, install Jest and RTL libraries.”*