**Test Plan: React + Node.js App**

**1. Overview**

This test strategy outlines the approach for verifying the functionality of a full-stack web application built with a React frontend and Node.js backend.

**2. What is Being Tested**

* **Authentication:** Login with valid and invalid credentials.
* **Todo Management (CRUD):**
  + Creating a new todo
  + Viewing todo list
  + Editing an existing todo
  + Deleting a todo
* **API validation:** Response codes, payload correctness, and behavior.
* **UI validation:** Element visibility, input actions, and result assertions.

**3. Test Coverage Areas**

**UI Tests (Selenium + TestNG)**

* Valid login flow
* Invalid login error handling
* Create a new todo and verify display
* Edit an existing todo and verify update
* Delete a todo and verify removal
* Assert that UI reflects backend changes

**API Tests (Postman)**

* POST /login → authentication success/failure
* GET /items → list retrieval
* POST /items → item creation
* PUT /items/:id → update existing item
* DELETE /items/:id → remove item

**4. Tools Used & Why**

| **Tool** | **Purpose** |
| --- | --- |
| **Selenium (Java)** | Automates UI flows across browsers |
| **TestNG** | Organizes test cases and suites |
| **ExtentReports** | Generates detailed HTML reports |
| **Postman** | Manual and automated API testing |

**5. How to Run the Tests**

**UI Test Execution**

* Clone the project and navigate to the automation folder.
* Ensure dependencies via Maven are resolved.
* Launch backend (node server.js) and frontend (npm start).
* Run tests using TestNG via your IDE or terminal:

**API Test Execution**

* Import postman json collection and environment into Postman.
* Run all API requests via **Collection Runner**

**6. Assumptions & Limitations**

* Assumes backend runs on http://localhost:5000 and frontend on http://localhost:3000.
* Backend must have CORS enabled.
* Test data is not persistent (mock DB or in-memory).
* No auth token expiry or advanced security validations covered.
* Parallel test execution is not configured.