1. ReactJS-HOL

**1. Define SPA and its benefits**

**SPA (Single-Page Application)** is a web application that loads a single HTML page and dynamically updates content without refreshing the entire page.  
**Benefits:**

* Faster user experience
* Reduces server load
* Seamless navigation
* Better performance with cached resources

**2. Define React and identify its working**

**React** is a JavaScript library developed by Facebook for building user interfaces, especially for SPAs.  
**Working:**

* Uses a **component-based** architecture
* Updates UI using **virtual DOM**
* Renders only the changed parts of the UI

**3. Identify the differences between SPA and MPA**

| **Feature** | **SPA (Single-Page App)** | **MPA (Multi-Page App)** |
| --- | --- | --- |
| Page Loading | Loads once | Loads new page for each link |
| Speed | Faster after load | Slower due to full reloads |
| Navigation | Client-side routing | Server-side routing |
| Development | Complex JavaScript | Easier with HTML/CSS |

**4. Explain Pros & Cons of SPA**

**Pros:**

* Fast and smooth UX
* Caching improves speed
* Better for mobile apps

**Cons:**

* SEO challenges
* Initial load might be slower
* JavaScript must be enabled

**5. Explain about React**

React is a declarative, component-based JavaScript library for building dynamic user interfaces. It allows developers to build reusable UI components and manage application state effectively using hooks and context.

**6. Define Virtual DOM**

The **Virtual DOM** is a lightweight copy of the real DOM. React uses it to detect changes and update only the necessary parts of the actual DOM, which improves performance and efficiency.

**7. Explain Features of React**

* **JSX (JavaScript + XML)** – Easier UI creation
* **Components** – Reusable UI pieces
* **Virtual DOM** – Faster rendering
* **Unidirectional Data Flow** – Predictable state
* **Hooks** – Manage state and side-effects
* **React Native** – Build mobile apps with React