1. REACT HANDS ON

1. Define SPA and its benefits

SPA (Single Page Application) is a web application that loads a single HTML page and dynamically updates the content as the user interacts with the app without refreshing the page.

Benefits:

- Faster user experience
- Reduces server load
- Seamless navigation
- Improves performance after the initial load
- Better for building dynamic, responsive interfaces

2. Define React and identify its working

React is an open-source JavaScript library developed by Facebook for building user interfaces, especially SPAs.

How it works:

- Uses a **component-based architecture**
- Maintains a **virtual DOM** for efficient rendering
- Updates only the changed parts of the UI using **diffing algorithm**
- Components can manage their own state and be reused across the application

3. Identify the differences between SPA and MPA

Feature	SPA (Single Page App)	MPA (Multi Page App)
Page Load	Loads once, then updates dynamically	Loads a new page for every user interaction
Speed	Faster navigation after initial load	Slower, full page reload on every interaction
Complexity	Needs client-side routing and state handling	Easier with traditional server-side rendering
Example	Gmail, Facebook	Amazon, LinkedIn (older versions)

4. Explain Pros & Cons of Single-Page Application

Pros:

- Fast and responsive UI
- Reduced server load
- Enhanced user experience
- Works well with mobile apps and APIs

Cons:

- Poor SEO (Search Engine Optimization)
- Heavier initial load
- More complex to develop (routing, state management)

- Needs JavaScript to be enabled in the browser

5. Explain about React

React is a JavaScript library used to build interactive and dynamic user interfaces.

Key Points:

- Component-based
- Declarative syntax
- Efficient rendering using virtual DOM
- Can be used with other libraries or frameworks (e.g., Redux, React Router)
- React can be rendered on the server using frameworks like Next.js

6. Define Virtual DOM

Virtual DOM is a lightweight, in-memory representation of the real DOM.

How it helps:

- React creates a virtual DOM tree
- On state change, it creates a new virtual DOM and compares it with the old one
- Only the changed parts are updated in the real DOM (efficient updates)
- Speeds up UI rendering and improves performance

7. Explain Features of React

- **JSX:** JavaScript syntax extension that lets you write HTML in React
- **Components:** Reusable building blocks (Functional or Class)
- **Virtual DOM:** Efficient DOM updates
- **Unidirectional Data Flow:** One-way data binding from parent to child
- **React Hooks:** Enables functional components to manage state and side effects
- **Declarative UI:** You describe the UI and React manages it
- **React Developer Tools:** For debugging React applications in browser

HANDS-ON

CODE: App.js

```
import React from 'react';

function App() {
  return (
    <h1>Welcome to the first session of React</h1>
  );
}


export default App;
```

OUTPUT