**Question 1: What are components in React? Explain the difference between functional components and class components.**

**Answer:** Components in React are reusable building blocks of the UI. They help in creating a modular and maintainable code structure.

**Types of Components:**

1. **Functional Components:**
   * Simple JavaScript functions that return JSX.
   * Use React hooks (like useState and useEffect) for state and lifecycle management.
   * Easier to read, write, and test.
   * Example:
   * function Greeting(props) {
   * return <h1>Hello, {props.name}!</h1>;
   * }
2. **Class Components:**
   * ES6 classes that extend React.Component.
   * Have a render() method to return JSX.
   * Use lifecycle methods (componentDidMount, componentDidUpdate, etc.).
   * Example:
   * class Greeting extends React.Component {
   * render() {
   * return <h1>Hello, {this.props.name}!</h1>;
   * }
   * }

**Key Difference:** Functional components are preferred in modern React because they are simpler and more efficient with hooks, whereas class components are more complex and require this for state and props.

**Question 2: How do you pass data to a component using props?**

**Answer:** Props (short for "properties") allow passing data from a parent component to a child component. Props are **read-only** and help make components dynamic.

**Example:**

function Welcome(props) {

return <h1>Welcome, {props.username}!</h1>;

}

// Passing props from parent to child

function App() {

return <Welcome username="Ali" />;

}

Here, the username prop is passed from App to Welcome and used inside JSX.

**Question 3: What is the role of render() in class components?**

**Answer:** The render() method in class components is responsible for returning JSX that defines the component’s UI.

**Role of render():**

* Determines what should be displayed on the screen.
* Gets called every time the component re-renders due to state or prop changes.
* Must return a single parent element.

**Example:**

class Message extends React.Component {

render() {

return <h1>Hello, {this.props.name}!</h1>;

}

}

In this example, render() returns JSX, and React updates the DOM accordingly.