***React Toolkit:***

***1.What is React?***

React, sometimes referred to as a frontend JavaScript framework, is a JavaScript library created by Facebook.

React is a tool for building UI components.

React was created by Jordan Walke, a software engineer working for Facebook. React was first deployed on Facebook's News Feed in 2011 and on Instagram in 2012.

**2.How does React Work?**

React creates a VIRTUAL DOM in memory.

Instead of manipulating the browser's DOM directly, React creates a virtual DOM in memory, where it does all the necessary manipulating, before making the changes in the browser DOM.

**3. What are the major features of React?**

→Uses JSX syntax, a syntax extensions of JS that allows developers to write html in their JS code.It uses Virtual DOM instead of real DOM considering that DOM manipulations are expensive.

→ Supports server-side rendering which is useful for SEO.

→One way data flow or data binding.

→Uses reusable.

**4.What is JSX?**

JSX stands for Javascript XML. JSX allows us to write HTML in React. JSX makes it easy to write and add HTML in React.

**5.How to create Components in React?**

Components are the building blocks of creating User Interfaces in React.There are two possible way to crrate a compnent:

**i. Functional Components:**This is simplest way to create a component. Those are pure Javascript functions that props objects as the first paramteter abd return React elements to render the output.

**ii. Class Components:** You can also ES6 class to define class component.

**6. What is State?**

State of a component is an object that holds some information that may change over the lifetime of the components.The important point is whenever the state object changes, the component re-renders.It is always recommended to make our state as possible and minimize the number of stateful components.

State is used for internal communication inside a Component.

**7.What are props in React?**

Props are inputs to components. They are single values or objects containing a set of values that are passed to components on creation similar to HTML-tag attributes.Here, the data is passed down from a parent component to a child component.

Purpose of props in react:

→pass custom data to your component

→trigger state changes.

→Use via this.props.reactProp inside component’s render() method

**8.What is the difference between state and props?**

→In react, both state and props are plain javascript objects and used to manage the data of a component, but they are used in different ways and have different characteristics.

→State is managed by the component itself and can be updated using the setState() function. Unlike props

→ State can be modified by the component and is used to manage the internal state of component.

→Changes in the state trigger a re-render of the component and its children.

→Props are passed to a component by its parent component and are read-only.

→Props can pass data between components.

**9.What is “key” props and what is the benefit of using it in arrays of elements?**

A key is special attribute you should include when creating arrays of elements. Key prop helps React identify which items have changed, are added, or are removed.

Keys should be unique among its siblings. Most often we use Id from our data as key:

Const allBooks = books.map((book) => <li key ={book.id}>{book.name}</li>)

10.What is the refs?

The ref is used to return a reference to the element.They should be avioded in most cases, however, they can be useful when you need a direct access to the DOM element or an instance of a component.

**11.What is Virtual DOM?**

The Virtual DOM is an in-memory representation of a UI is kept in memory and synced with the real DOM. It’s a step that happens between the render function is being called and the displaying of elements on the screen. This entire process is called reconciliation.

**12. How Virtual DOM works?**

→Whenever any underlying data changes, the entire UI is re-rendering in virtual DOM representation.

→Then the difference between the previous DOM representation and the new one is calculated

→Once the calculation are done, the real DOM will be updated with only things that have actually changed.

**13.What is the difference between Shadow DOM and Virtual DOM?**

The shadow DOM is browser technology designed primarily for scoping variables and CSS in web components.The Virtual DOM is a concept implemented by libraries on top of browser APIs.

**14.What is lifting State up in React?**

**15.What are the different phases of Component lifecycle?**

→Mounting:

- useState and useEffect are called during the mounting phase.

- useState sets the initial state of the component.

- useEffect is used to perform any side effects after the component has mounted.

→Updating:

- Whenever the component state or props change, the component re-renders.

- During the updating phase, useEffect is called again.

- Any changes to the state or props can be handled here.

→Unmounting:

-When the component is removed from the DOM, useEffect can be used for cleanup operations.

- The cleanup function is called right before the component is unmounted.

**16. What are the Controlled Components?**

A Component that controls the input elements within the forms on subsequent user input is called Controlled Components, every state mutation will have an associated handler function.

**17.What are the Uncontrolled Components?**

→The Uncontrolled Components are the ones that store their own state internally, and you query the DOM using a ref to find its current value when you need it. This is a bit more like traditional HTML.

**18.What is children prop?**

Children is a prop that allows you to pass components as data to other components, just like any other prop you use. Components tree put between components opening and closing tag will be passed to that Components as children prop

**19.What are the Fragments?**

It's a common pattern or practice in React for a component to return multiple elements. Fragments let you group a list of children without adding extra nodes to the DOM. You need to use either or a shorter syntax having empty tag (<></>).

**20.Why you can update props in react?**

The React philosophy is that props should be immutable and top-down. This means that a parent can send any prop values to a child, but the child can't modify received props.

**21.What is react router?**

React Router is a powerful routing library built on top of React that helps you add new screens and flows to your application incredibly quickly, all while keeping the URL in sync with what's being displayed on the page.

**22.What is Diffing Algorithm?**