

MERN Stack Interview Questions

Here are 50 basic questions that can be asked in a MERN stack viva, with React using Vite:

1. What is the MERN stack?

- **Answer:** MERN stack is a combination of MongoDB, Express.js, React.js, and Node.js. It's a full-stack development framework that allows for the development of scalable web applications using JavaScript for both the client and server sides.

2. What is React?

- **Answer:** React is a JavaScript library developed by Facebook for building user interfaces. It allows developers to create reusable UI components and manage the state efficiently with a virtual DOM.

3. What is Vite and why is it used with React?

- **Answer:** Vite is a fast build tool and development server. It significantly improves the development experience with fast hot module replacement (HMR) and optimized bundling, making it a great choice for React projects.

4. What is the Virtual DOM in React?

- **Answer:** The Virtual DOM is a lightweight representation of the real DOM in memory. React uses it to optimize updates by diffing the Virtual DOM with the real DOM and only updating the changed parts.

5. What are components in React?

- **Answer:** Components are the building blocks of a React application. They are reusable, self-contained UI elements that can be either stateful or stateless and render content based on the input they receive.

6. What is JSX in React?

- **Answer:** JSX stands for JavaScript XML. It's a syntax extension for JavaScript, allowing you to write HTML-like code inside JavaScript. React uses JSX to describe what the UI should look like.

7. What are props in React?

- **Answer:** Props (short for "properties") are a way to pass data from parent components to child components in React. They are read-only and cannot be modified by the child component.

8. What is state in React?

- **Answer:** State is a built-in React object used to store data that can change over the lifetime of the component. Unlike props, state is mutable and can be updated within the component.

9. What is the difference between props and state?

- **Answer:** Props are used to pass data from parent to child components, and they are immutable. State is used to manage data within a component and is mutable.

10. What is a functional component in React?

- **Answer:** A functional component is a simple JavaScript function that returns JSX. It does not have a lifecycle or state management unless React hooks are used.

11. What is a class component in React?

- **Answer:** A class component is a more traditional way to define components in React. It extends `React.Component` and has a `render` method. Class components can manage state and have lifecycle methods.

12. What are hooks in React?

- **Answer:** Hooks are functions that allow you to use state and other React features in functional components. Examples include `useState`, `useEffect`, and `useContext`.

13. What is the `useState` hook?

- **Answer:** The `useState` hook allows functional components to manage state. It returns an array with the current state value and a function to update it.

14. What is the `useEffect` hook?

- **Answer:** The `useEffect` hook is used to perform side effects in functional components, such as fetching data, subscribing to events, or manually changing the DOM.

15. What is React Router?

- **Answer:** React Router is a library used for handling routing in React applications. It allows for navigating between different views or pages within a single-page application.

16. What is an API in the context of MERN stack?

- **Answer:** An API (Application Programming Interface) allows different software systems to communicate with each other. In MERN stack, the Express.js server acts as the backend API, interacting with MongoDB to manage data.

17. What is MongoDB?

- **Answer:** MongoDB is a NoSQL database that stores data in JSON-like documents. It is schema-less and allows for flexible data models, making it ideal for applications with varying data structures.

18. What is Express.js?

- **Answer:** Express.js is a minimal and flexible Node.js web application framework that simplifies routing, handling HTTP requests, and managing middleware for web and mobile applications.

19. What is Node.js?

- **Answer:** Node.js is a runtime environment that allows you to execute JavaScript on the server side. It is built on Chrome's V8 JavaScript engine and is ideal for building scalable, high-performance applications.

20. How does Vite improve the development process in React?

- **Answer:** Vite provides faster builds and faster hot module replacement (HMR), which improves the development experience compared to traditional bundlers like Webpack.

21. What is the role of `package.json` in a React project?

- **Answer:** `package.json` contains metadata about the project, including dependencies, scripts, and other configurations. It is essential for managing the project's libraries and development tasks.

22. What is the purpose of the `public` folder in a React project?

- **Answer:** The `public` folder contains static assets like images, icons, and the `index.html` file. This is the only file React directly modifies when loading the application.

23. What is Redux?

- **Answer:** Redux is a state management library for JavaScript apps, particularly useful in React applications. It provides a central store that holds the state of the entire app and ensures that the state is predictable.

24. What is a middleware in Express.js?

- **Answer:** Middleware is a function in Express.js that has access to the request and response objects. It can modify the request, execute code, or end the request-response cycle.

25. What is CORS (Cross-Origin Resource Sharing)?

- **Answer:** CORS is a security feature that allows or restricts resources on a web server to be requested from another domain. It is commonly configured in Express.js when making API calls from different origins.

26. What is Mongoose in the context of MongoDB?

- **Answer:** Mongoose is an ODM (Object Data Modeling) library for MongoDB and Node.js. It simplifies working with MongoDB by providing a schema-based solution to model application data.

27. How do you create a new React app using Vite?

- **Answer:** You can create a new React app using Vite by running:

```
sql

`npm create vite@latest my-app --template react`
```

28. What are the advantages of using Vite over Webpack?

- **Answer:** Vite provides faster builds, faster hot module replacement (HMR), and simpler configuration compared to Webpack. It uses ES modules for development and only bundles when necessary for production.

29. How do you install dependencies in a React project?

- **Answer:** Dependencies can be installed using the following command:

```
nginx

`npm install`
```

30. What is a RESTful API?

- **Answer:** REST (Representational State Transfer) is an architectural style for building web services. A RESTful API uses HTTP methods like GET, POST, PUT, DELETE, etc., to interact with resources.

31. What is the difference between GET and POST methods in HTTP?

- **Answer:** The GET method is used to fetch data from the server, while the POST method is used to send data to the server, typically to create or update resources.

32. What is the role of `useContext` in React?

- **Answer:** `useContext` is a React hook that allows components to access values stored in a React Context without explicitly passing them down as props.

33. What is the `key` prop in React?

- **Answer:** The `key` prop is used to identify elements in a list and improve React's rendering performance by helping it determine which items have changed, are added, or are removed.

34. What is the purpose of the `render()` method in a class component?

- **Answer:** The `render()` method in class components returns the JSX that will be rendered to the DOM. It must return a single element or component.

35. How do you handle form submissions in React?

- **Answer:** Form submissions in React are handled using state to store form values, and a function that prevents the default behavior of form submission and processes the data.

36. What is the purpose of `npm start`?

- **Answer:** `npm start` is used to start the development server and launch the React app in the browser during development.

37. What is a callback function in React?

- **Answer:** A callback function in React is a function that is passed as a prop from one component to another, often used to handle events or pass data between components.

38. What is the role of MongoDB in the MERN stack?

- **Answer:** MongoDB is the database used in the MERN stack to store application data in a flexible, JSON-like format.

39. How does Express.js handle routes?

- **Answer:** Express.js handles routes by defining HTTP methods (GET, POST, etc.) for different paths (URLs). Each route has a callback function that is executed when the route is accessed.

40. What is the use of `dotenv` in a Node.js application?

- **Answer:** `dotenv` is a module used to load environment variables from a `.env` file into `process.env`. It helps in managing sensitive information like API keys and database credentials.

41. What is the difference between `var`, `let`, and `const` in JavaScript?

- **Answer:** `var` has function scope, while `let` and `const` have block scope. `let` allows reassignment, while `const` does not.

42. What is the `useRef` hook used for in React?

- **Answer:** `useRef` is used to persist values across renders without triggering a re-render. It is commonly used for accessing DOM elements directly or storing mutable values.

43. What are controlled components in React?

- **Answer:** Controlled components are those where form elements (like input, select, textarea) are controlled by React state. The state is used to manage the value of these elements.

44. What is MongoDB Atlas?

- **Answer:** MongoDB Atlas is a fully-managed cloud database service provided by MongoDB. It simplifies the process of setting up, scaling, and managing a MongoDB database.

45. What are environment variables?

- **Answer:** Environment variables are variables that are set outside the application, typically to store configuration values such as database URLs, API keys, and credentials.

46. What is the role of `npm run build`?

- **Answer:** ``npm run build`` is used to bundle the application for production. It optimizes the code, minifies it, and prepares it for deployment.

47. What is Cross-Site Scripting (XSS)?

- **Answer:** XSS is a security vulnerability that allows attackers to inject malicious scripts into web pages viewed by users. It is commonly mitigated by sanitizing user input.

48. What is the purpose of ``useMemo`` in React?

- **Answer:** ``useMemo`` is a hook used to optimize performance by memoizing expensive calculations, ensuring that they are only recalculated when the dependencies change.

49. What is MongoDB's aggregation framework?

- **Answer:** MongoDB's aggregation framework allows for complex data transformations and queries using stages like ``$match``, ``$group``, and ``$sort``.

50. How do you deploy a MERN stack application?

- **Answer:** A MERN stack application can be deployed using cloud platforms like Heroku, AWS, or DigitalOcean. Typically, the frontend (React) is built and served from a web server, and the backend (Node/Express) is hosted on a server with MongoDB Atlas for the database.

Good luck with your viva!