**UNIT 1: UI Design**

**1. What are the key features of HTML5?**

* Semantic tags like <header>, <footer>, <article>.
* Multimedia support: <audio>, <video>.
* New input types: email, date, range.
* Canvas and SVG for graphics.
* Local & session storage.
* Geolocation API.

**2. What is the Canvas API in HTML5?**

* It allows drawing graphics using JavaScript on a web page.
* Use <canvas> element and getContext('2d') for drawing shapes, lines, images.

**3. Difference between localStorage and sessionStorage?**

* localStorage: Stores data with no expiration; persists across sessions.
* sessionStorage: Data is deleted when the session (tab) ends.

**4. Key features of CSS3?**

* Media queries for responsiveness.
* Transitions, animations, gradients.
* Flexbox and Grid layout.
* Pseudo-classes like :nth-child, :hover.

**5. What is DOM in JavaScript?**

* DOM (Document Object Model) is a programming interface for HTML and XML.
* Allows JS to access and manipulate the structure, content, and style of a document.

**6. Explain event handling in JavaScript.**

* Events are user interactions like click, hover, keypress.
* Handled using .addEventListener() or inline onclick.

**7. What is the BOM?**

* Browser Object Model.
* Allows interaction with the browser like window, navigator, screen, location.

**8. How is form validation handled in JavaScript?**

* Check inputs before submission using if...else or regular expressions.
* Example: if (email.includes('@')) { ... }

**9. What are object-oriented techniques in JavaScript?**

* Use of objects, constructors, prototypes, and classes (class, constructor).
* Inheritance using extends.

**10. Difference between XML and JSON?**

* **XML**: Verbose, tag-based, used in legacy systems.
* **JSON**: Lightweight, key-value format, native to JavaScript.

**11. What is AJAX?**

* Asynchronous JavaScript and XML.
* Used to send/receive data from the server without reloading the page.

**12. What is jQuery?**

* A fast, small JS library to simplify HTML DOM, AJAX, and event handling.

**13. What is D3.js?**

* A JavaScript library for data visualization using SVG, Canvas, and HTML.

**UNIT 2: React JS**

**14. What is React JS?**

* A JS library for building user interfaces using components.

**15. What is a component in React?**

* Reusable piece of UI. Can be class-based or functional.

**16. What are props and state?**

* Props: Passed from parent to child, read-only.
* State: Local data storage in a component, can be changed using useState().

**17. How do you handle lists and conditionals in React?**

* Lists: Use .map() method.
* Conditionals: Use ternary condition ? A : B or && operators.

**18. How can you style React components?**

* Inline styling, CSS modules, styled-components.

**19. How do you debug React apps?**

* Using browser dev tools, React Developer Tools extension, and console.log().

**20. How does React handle HTTP Requests?**

* Using fetch() or Axios inside useEffect().

**UNIT 3: Electron JS**

**21. What is Electron JS?**

* A framework to build cross-platform desktop apps using JS, HTML, and CSS.

**22. Key features of Electron JS?**

* Combines Chromium and Node.js.
* Single codebase runs on Windows, Mac, and Linux.

**23. What is the structure of an Electron app?**

* **Main process**: Runs background operations.
* **Renderer process**: Controls UI.

**24. How do you deploy an Electron app?**

* Package using tools like electron-packager or electron-builder.

**UNIT 4: RESTful Web Services**

**25. What is REST?**

* Representational State Transfer.
* Architecture for designing networked applications using HTTP.

**26. What are REST principles?**

* Stateless, Client-server, Cacheable, Uniform interface, Layered system.

**27. What is URI modeling?**

* Designing URIs to represent resources (e.g., /users/123).

**28. How is data formatted in REST?**

* Typically uses JSON or XML.

**29. What is JAX-RS?**

* Java API for RESTful Web Services.
* Uses annotations like @GET, @POST, @Path.

**UNIT 5: Node.js**

**30. What is Node.js?**

* A server-side runtime environment built on Chrome’s V8 JS engine.

**31. Features of Node.js?**

* Non-blocking, event-driven, scalable, single-threaded.

**32. What is the architecture of Node.js?**

* Event loop, callback mechanism, asynchronous I/O.

**33. How do you create a web server in Node.js?**

javascript

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const http = require('http');

http.createServer((req, res) => {

res.end("Hello Node!");

}).listen(3000);

**34. Explain GET and POST implementation in Node.js.**

* GET: Used to retrieve data.
* POST: Used to send data to server.

**35. How do you connect Node.js to MongoDB?**

* Use mongoose or mongodb package to connect and perform CRUD.

**UNIT 6: PHP and MySQL**

**36. What is PHP?**

* Server-side scripting language for web development.

**37. Difference between PHP5 and PHP6?**

* PHP6 aimed to support Unicode fully, but it was discontinued.
* PHP5 introduced OOP, PDO for database.

**38. How are forms handled in PHP?**

* Using $\_GET, $\_POST, and $\_REQUEST to collect form data.

**39. How do you connect PHP with MySQL?**

php

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$conn = mysqli\_connect("localhost", "user", "pass", "dbname");

**40. What are arrays in PHP?**

* Indexed, associative, and multidimensional arrays.

**41. How do you perform CRUD in PHP + MySQL?**

* Use SQL queries inside PHP using mysqli\_query() or PDO.

**✅ Unit 1: UI Design (HTML5, CSS3, JavaScript, XML, JSON, AJAX, jQuery, D3JS)**

**HTML5**

1. **Q: What is HTML5?**
   * A: HTML5 is the latest version of HTML that is used to design the structure of web pages with new features like audio, video, canvas, and local storage.
2. **Q: What are some features of HTML5?**
   * A: Semantic tags (<header>, <footer>, <article>), audio and video support, canvas for graphics, local and session storage, geolocation API.
3. **Q: What is the use of the <canvas> tag?**
   * A: It is used to draw graphics like charts, animations, and games using JavaScript.
4. **Q: What is the difference between sessionStorage and localStorage?**
   * A: sessionStorage stores data temporarily (until the browser/tab is closed), while localStorage stores data permanently (even after closing the browser).

**CSS3**

1. **Q: What is CSS3?**
   * A: CSS3 is the latest version of CSS used for styling HTML pages, including new features like animations, transitions, gradients, and media queries.
2. **Q: Name any three features of CSS3.**
   * A: Media queries, Flexbox, Animations, and Gradients.
3. **Q: What is the difference between class and id in CSS?**
   * A: Class is used for multiple elements (.class), id is unique for one element (#id).

**JavaScript**

1. **Q: What is JavaScript?**
   * A: JavaScript is a scripting language used to add interactivity and dynamic behavior to websites.
2. **Q: What is DOM?**
   * A: DOM (Document Object Model) represents the structure of a webpage as a tree of elements that JavaScript can access and modify.
3. **Q: What is BOM?**
   * A: BOM (Browser Object Model) allows JavaScript to interact with the browser like alert boxes, navigator, location, history, etc.
4. **Q: What is event handling in JavaScript?**
   * A: It is the process of responding to user actions like clicks, mouse movements, and keyboard inputs.
5. **Q: How do you validate a form using JavaScript?**
   * A: By checking input values using conditions before submission (e.g., checking if a field is empty or if email format is correct).
6. **Q: What is Object-Oriented JavaScript?**
   * A: JavaScript supports objects, classes, constructors, and inheritance to write reusable and modular code.

**XML and JSON**

1. **Q: What is XML?**
   * A: XML (eXtensible Markup Language) is used to store and transport data in a structured format.
2. **Q: What is JSON?**
   * A: JSON (JavaScript Object Notation) is a lightweight data format used to exchange data between server and browser.

**AJAX, jQuery, D3JS**

1. **Q: What is AJAX?**
   * A: AJAX allows web pages to send and receive data from the server asynchronously without reloading the page.
2. **Q: What is jQuery?**
   * A: jQuery is a JavaScript library that simplifies DOM manipulation, event handling, and AJAX calls.
3. **Q: What is D3.js?**
   * A: D3.js is a JavaScript library used to create interactive and dynamic data visualizations like charts using SVG and HTML.

**✅ Unit 2: ReactJS**

1. **Q: What is ReactJS?**
   * A: ReactJS is a JavaScript library used to build user interfaces, especially single-page applications.
2. **Q: What are components in React?**
   * A: Components are reusable pieces of code that represent part of the UI (e.g., buttons, headers).
3. **Q: What is the difference between functional and class components?**
   * A: Functional components are simple functions; class components use ES6 class syntax and support state and lifecycle methods.
4. **Q: How does React handle HTTP requests?**
   * A: React uses tools like fetch() or Axios to make AJAX requests to APIs and update UI with the response.
5. **Q: What is JSX?**
   * A: JSX is a syntax extension that allows writing HTML inside JavaScript in React.
6. **Q: How can you apply styles in React?**
   * A: Using inline styles, CSS files, or styled-components.

**✅ Unit 3: Electron JS**

1. **Q: What is Electron JS?**
   * A: Electron JS is a framework used to build cross-platform desktop applications using HTML, CSS, and JavaScript.
2. **Q: How does Electron work?**
   * A: Electron combines Chromium and Node.js to run web code as desktop apps.
3. **Q: What are the main components of an Electron app?**
   * A: Main process (controls app lifecycle) and Renderer process (displays UI).
4. **Q: What is the advantage of Electron JS?**
   * A: You can use web technologies to create desktop apps for Windows, Mac, and Linux.

**✅ Unit 4: RESTful Web Services**

1. **Q: What is REST?**
   * A: REST (Representational State Transfer) is an architecture for designing networked applications using standard HTTP methods.
2. **Q: What are HTTP methods used in REST?**
   * A: GET (read), POST (create), PUT (update), DELETE (remove).
3. **Q: What is a URI?**
   * A: URI (Uniform Resource Identifier) is the address used to access resources in RESTful APIs.
4. **Q: What is JAX-RS?**
   * A: Java API for RESTful Web Services used to develop RESTful applications in Java.
5. **Q: What is JSON format in REST APIs?**
   * A: JSON is commonly used to exchange data between client and server in REST APIs.

**✅ Unit 5: Node.js**

1. **Q: What is Node.js?**
   * A: Node.js is a server-side JavaScript runtime used to build fast and scalable applications.
2. **Q: What are the features of Node.js?**
   * A: Event-driven, non-blocking I/O, single-threaded, fast execution using Google’s V8 engine.
3. **Q: What is the architecture of Node.js?**
   * A: It follows event-driven, asynchronous architecture with a single-threaded event loop.
4. **Q: How do you handle HTTP requests in Node.js?**
   * A: Using the built-in http module to create server, handle requests and responses.
5. **Q: How do you connect Node.js with NoSQL like MongoDB?**
   * A: Using packages like mongoose or mongodb driver.
6. **Q: What are CRUD operations in Node.js?**
   * A: Create, Read, Update, Delete – used to manage data in databases.

**✅ Unit 6: PHP and MySQL**

1. **Q: What is PHP?**
   * A: PHP is a server-side scripting language used to create dynamic web pages and interact with databases.
2. **Q: What is the difference between PHP5 and PHP6?**
   * A: PHP6 aimed to add better Unicode support but was later abandoned. PHP7 is more widely used now with better speed and error handling.
3. **Q: How does PHP handle forms?**
   * A: Using $\_GET and $\_POST to collect form data.
4. **Q: How do you connect PHP with MySQL?**
   * A: Using mysqli\_connect() or PDO for secure and efficient connection.
5. **Q: What are arrays in PHP?**
   * A: Arrays store multiple values in a single variable; can be indexed or associative.
6. **Q: What is the role of PHP in web development?**
   * A: It processes backend logic, handles form data, connects to databases, and generates dynamic content.