**React**

**Multiple Choice Questions (Choose the correct option)**

1. What is the primary purpose of React?  
   A) Styling  
   B) Server-side scripting  
   C) Building UI  
   D) Database interaction
2. What is JSX?  
   A) CSS extension  
   B) Server language  
   C) JS with XML syntax  
   D) Database language
3. Which method is used to render React content to the DOM?  
   A) renderHTML()  
   B) ReactDOM.render()  
   C) DOM.write()  
   D) show()
4. Which hook is used to manage state in functional components?  
   A) useEffect  
   B) useState  
   C) useReducer  
   D) useRef
5. What is a key in React lists?  
   A) Component name  
   B) Element type  
   C) Unique identifier  
   D) DOM node
6. How can you lift state up in React?  
   A) Clone it  
   B) Move it to a common parent  
   C) Duplicate it  
   D) Use Redux
7. What is useEffect used for?  
   A) Styling  
   B) Routing  
   C) Side effects (e.g., API calls)  
   D) Form input
8. React is...  
   A) MVC Framework  
   B) Templating Engine  
   C) Library  
   D) ORM
9. Which prop helps uniquely identify elements in a list?  
   A) id  
   B) key  
   C) name  
   D) ref
10. What happens if you change state directly (e.g., state.count = 1)?  
    A) Works fine  
    B) It won't re-render  
    C) Updates DOM  
    D) Crashes app
11. What is the correct way to update state with useState?  
    A) state = 5  
    B) setState(5)  
    C) setCount(5)  
    D) this.state = 5
12. What does the virtual DOM improve?  
    A) Security  
    B) Performance  
    C) Styling  
    D) Authentication
13. Which hook lets you access lifecycle events in functional components?  
    A) useRef  
    B) useCallback  
    C) useEffect  
    D) useState
14. React components must start with...  
    A) Any letter  
    B) Lowercase  
    C) Uppercase  
    D) Underscore
15. What does useRef return?  
    A) Array  
    B) Boolean  
    C) Mutable object with .current  
    D) String
16. What is a controlled component?  
    A) Updates itself  
    B) Form input controlled via state  
    C) Static form  
    D) Unmounted
17. Which hook is used to manage complex state logic?  
    A) useMemo  
    B) useEffect  
    C) useReducer  
    D) useCallback
18. Which React feature lets components subscribe to context changes?  
    A) useRef  
    B) Redux  
    C) useContext  
    D) useCallback
19. What does useMemo do?  
    A) Executes side effects  
    B) Manages routing  
    C) Memoizes value  
    D) Renders conditionally
20. What is React Fragment used for?  
    A) AJAX calls  
    B) Conditional rendering  
    C) Grouping elements without extra DOM  
    D) Hooks
21. How are props passed in React?  
    A) By reference  
    B) From parent to child  
    C) Globally  
    D) By state
22. Which of the following is NOT a React hook?  
    A) useEffect  
    B) useRequest  
    C) useState  
    D) useRef
23. Which file extension is typically used for React components?  
    A) .js only  
    B) .jsx only  
    C) .js or .jsx  
    D) .html
24. What is the default behavior of a form submit in React?  
    A) Renders again  
    B) Refreshes the page  
    C) Submits to server  
    D) Does nothing
25. What library is commonly used with React for routing?  
    A) Redux  
    B) react-router-dom  
    C) Axios  
    D) Zustand

**✅ Answer Key**

1. C
2. C
3. B
4. B
5. C
6. B
7. C
8. C
9. B
10. B
11. C
12. B
13. C
14. C
15. C
16. B
17. C
18. C
19. C
20. C
21. B
22. B
23. C
24. B
25. B

### **Multiple Choice Questions**

1. What does React.StrictMode help with?  
   A) Adds styling  
   B) Prevents state changes  
   C) Highlights potential problems  
   D) Prevents DOM updates
2. What is the purpose of key prop in lists?  
   A) Styling  
   B) DOM access  
   C) Animation  
   D) Track element identity
3. Which hook helps avoid unnecessary re-renders by caching callbacks?  
   A) useRef  
   B) useReducer  
   C) useCallback  
   D) useMemo
4. How do you import useState in React?  
   A) import useState from 'react'  
   B) require('useState')  
   C) import { useState } from 'react'  
   D) from react import useState
5. What is the default behavior of useEffect if no dependencies are passed?  
   A) Runs once  
   B) Never runs  
   C) Runs on every render  
   D) Runs on DOM load only
6. What is the correct order of React component lifecycle (class)?  
   A) Mount → Update → Unmount  
   B) Create → Use → Delete  
   C) Init → Render → Commit  
   D) Start → Stop → Reload
7. What’s the purpose of defaultProps in a component?  
   A) Styling  
   B) Backup prop values  
   C) Lifecycle methods  
   D) DOM manipulation
8. What is the main advantage of React Router?  
   A) Global state management  
   B) Form handling  
   C) DOM updates  
   D) Client-side routing
9. Which hook helps access DOM nodes?  
   A) useState  
   B) useContext  
   C) useReducer  
   D) useRef
10. What does setState in class component do?  
    A) Replaces the component  
    B) Logs props  
    C) Updates state and re-renders  
    D) Stops rendering
11. Which of the following can be used for conditional rendering?  
    A) if  
    B) &&  
    C) ? :  
    D) All of the above
12. What does React.lazy() enable?  
    A) State control  
    B) CSS injection  
    C) Code splitting  
    D) DOM inspection
13. Which keyword is used to define a class component?  
    A) component  
    B) class  
    C) object  
    D) define
14. What is Redux used for?  
    A) Routing  
    B) Animations  
    C) State management  
    D) Forms
15. What is a Higher-Order Component (HOC)?  
    A) Component with more state  
    B) Component that manages routing  
    C) Component that returns another component  
    D) Styled component
16. Which method is used in class components to access props?  
    A) this.getProps()  
    B) props()  
    C) this.props  
    D) prop
17. How many root elements can a React component return?  
    A) Any number  
    B) Only 2  
    C) Exactly one  
    D) None
18. What is used to prevent default form submission?  
    A) form.reset()  
    B) stopForm()  
    C) e.preventDefault()  
    D) blockForm()
19. What does ReactDOM.createPortal do?  
    A) Adds animations  
    B) Enables server rendering  
    C) Renders outside root DOM  
    D) Adds fragments
20. Which tool is used to create a new Vite + React project?  
    A) npx create-react-app  
    B) npm init react  
    C) npm create vite@latest  
    D) vite-react
21. What is Suspense used for in React?  
    A) Routing  
    B) Lazy loading fallback  
    C) Error handling  
    D) State control
22. Which of the following is not a valid React component type?  
    A) Functional  
    B) Class  
    C) Hook  
    D) HOC
23. React renders changes using...  
    A) Binary trees  
    B) Real DOM  
    C) Virtual DOM  
    D) Shadow DOM
24. How do you pass data from child to parent?  
    A) Props  
    B) Context  
    C) Event callback function  
    D) Hook
25. What hook is best for managing form field values?  
    A) useEffect  
    B) useRef  
    C) useReducer  
    D) useState

## ✅ **Answer Key**

1. C
2. D
3. C
4. C
5. C
6. A
7. B
8. D
9. D
10. C
11. D
12. C
13. B
14. C
15. C
16. C
17. C
18. C
19. C
20. C
21. B
22. C
23. C
24. C
25. D

HTML

### **Multiple Choice Questions**

1. What does HTML stand for?  
   A) Hyper Trainer Marking Language  
   B) Hyper Text Markup Language  
   C) Hyper Text Marketing Language  
   D) High Text Machine Language
2. What is the correct HTML element for inserting a line break?  
   A) <break>  
   B) <br>  
   C) <lb>  
   D) <line>
3. Which tag is used to create a hyperlink?  
   A) <a>  
   B) <href>  
   C) <link>  
   D) <hyper>
4. How can you make a numbered list?  
   A) <ul>  
   B) <ol>  
   C) <dl>  
   D) <list>
5. Which attribute specifies an image source?  
   A) href  
   B) link  
   C) src  
   D) img
6. What is the correct HTML element for the largest heading?  
   A) <heading>  
   B) <h6>  
   C) <head>  
   D) <h1>
7. Which tag is used to create a checkbox?  
   A) <check>  
   B) <input type="checkbox">  
   C) <checkbox>  
   D) <cb>
8. How can you create an email link?  
   A) <a href="email">  
   B) <mail>  
   C) <a href="mailto:example@mail.com">  
   D) <email href="example@mail.com">
9. What is the correct syntax for adding a background color in HTML?  
   A) <body style="color: blue;">  
   B) <body background="blue">  
   C) <body style="background-color: blue;">  
   D) <background=blue>
10. Which tag is used to display a table?  
    A) <table>  
    B) <tab>  
    C) <tb>  
    D) <tbl>
11. Which tag defines a table row?  
    A) <td>  
    B) <th>  
    C) <tr>  
    D) <row>
12. Which tag defines a table cell?  
    A) <tr>  
    B) <td>  
    C) <cell>  
    D) <col>
13. How do you insert a comment in HTML?  
    A) // comment  
    B) /\* comment \*/  
    C) <!-- comment -->  
    D) # comment
14. Which HTML tag is used to define an internal style sheet?  
    A) <css>  
    B) <style>  
    C) <script>  
    D) <link>
15. Which tag is used to insert an image in HTML?  
    A) <img>  
    B) <image>  
    C) <src>  
    D) <picture>
16. What does the alt attribute in an image tag do?  
    A) Sets image height  
    B) Sets image width  
    C) Adds a tooltip  
    D) Provides alternate text
17. Which HTML element defines the title of a document?  
    A) <meta>  
    B) <head>  
    C) <title>  
    D) <header>
18. Which tag is used to define a list item?  
    A) <li>  
    B) <item>  
    C) <ul>  
    D) <list>
19. Which element is used to input multi-line text?  
    A) <textbox>  
    B) <text>  
    C) <textarea>  
    D) <input multiline>
20. Which tag is used to embed JavaScript code in HTML?  
    A) <js>  
    B) <javascript>  
    C) <code>  
    D) <script>
21. What is the default alignment of content in a <div> tag?  
    A) Center  
    B) Justify  
    C) Left  
    D) Right
22. What is the correct HTML for creating a drop-down list?  
    A) <dropdown>  
    B) <select>  
    C) <option>  
    D) <list>
23. What does the <hr> tag represent?  
    A) Heading rule  
    B) Horizontal ruler  
    C) Header  
    D) Hidden rule
24. Which element is used for inline text formatting?  
    A) <div>  
    B) <p>  
    C) <span>  
    D) <section>
25. Which tag is used to define navigation links?  
    A) <nav>  
    B) <navigate>  
    C) <route>  
    D) <menu>

## ✅ **Answer Key**

1. B
2. B
3. A
4. B
5. C
6. D
7. B
8. C
9. C
10. A
11. C
12. B
13. C
14. B
15. A
16. D
17. C
18. A
19. C
20. D
21. C
22. B
23. B
24. C
25. A

**CSS**

### **Multiple Choice Questions**

1. What does CSS stand for?  
   A) Computer Style Sheets  
   B) Creative Style Syntax  
   C) Cascading Style Sheets  
   D) Colorful Style Syntax
2. Where should you ideally place external CSS?  
   A) Inside HTML head  
   B) Inside body  
   C) At the end of HTML  
   D) After closing tag
3. How do you add an external CSS file?  
   A) <style href="style.css">  
   B) <css link="style.css">  
   C) <link rel="stylesheet" href="style.css">  
   D) <stylesheet src="style.css">
4. Which selector targets all <p> tags?  
   A) p[]  
   B) .p  
   C) #p  
   D) p
5. Which property controls the text size?  
   A) font-size  
   B) text-style  
   C) text-size  
   D) font-style
6. How do you make text bold?  
   A) font-weight: bold  
   B) font: bold  
   C) text-style: bold  
   D) style: bold
7. How do you select an element with id “header”?  
   A) .header  
   B) #header  
   C) header  
   D) \*header
8. Which unit is relative to the font size of the element?  
   A) px  
   B) %  
   C) em  
   D) in
9. How do you select all elements with class “box”?  
   A) .box  
   B) #box  
   C) \*box  
   D) box
10. What is the default value of position property?  
    A) relative  
    B) static  
    C) absolute  
    D) fixed
11. Which property is used to change background color?  
    A) color  
    B) bgcolor  
    C) background-color  
    D) background
12. How do you apply a style to all <h1> and <h2> elements?  
    A) h1, h2  
    B) h1 h2  
    C) h1 + h2  
    D) h1 > h2
13. How do you make a list horizontally aligned?  
    A) display: block  
    B) display: inline  
    C) float: left  
    D) list-style: none
14. Which property removes underline from links?  
    A) underline: none  
    B) text-decoration: none  
    C) decoration: none  
    D) link-style: none
15. Which property sets spacing between letters?  
    A) text-spacing  
    B) letter-spacing  
    C) spacing  
    D) word-spacing
16. What is the correct CSS syntax to change font to Arial?  
    A) font: arial  
    B) font-family: Arial  
    C) font-name: Arial  
    D) font-style: Arial
17. Which CSS property is used to control layout in flexbox?  
    A) display: grid  
    B) float  
    C) display: flex  
    D) flex: layout
18. Which value makes an element invisible but still takes space?  
    A) display: none  
    B) visibility: hidden  
    C) opacity: 0  
    D) hidden: true
19. How do you add shadow to text?  
    A) text-shadow  
    B) text-outline  
    C) shadow-text  
    D) font-shadow
20. Which CSS property is used to make rounded corners?  
    A) corner-radius  
    B) border-style  
    C) border-radius  
    D) curve
21. Which shorthand property sets margin on all sides?  
    A) margin-all  
    B) all-margin  
    C) margin  
    D) spacing
22. Which value of z-index will be on top?  
    A) -1  
    B) 0  
    C) 1  
    D) 999
23. Which selector targets a paragraph inside a div?  
    A) div p  
    B) div+p  
    C) p > div  
    D) p div
24. What does box-sizing: border-box do?  
    A) Adds border outside  
    B) Includes padding and border in total width  
    C) Removes border  
    D) Adds margin
25. Which property aligns text to the right?  
    A) text-align: right  
    B) align-text: right  
    C) right-align  
    D) text-justify

## ✅ **Answer Key**

1. C
2. A
3. C
4. D
5. A
6. A
7. B
8. C
9. A
10. B
11. C
12. A
13. C
14. B
15. B
16. B
17. C
18. B
19. A
20. C
21. C
22. D
23. A
24. B
25. A

**Javascript**

### **Multiple Choice Questions**

1. What is JavaScript primarily used for?  
   A) Styling web pages  
   B) Structuring web pages  
   C) Making web pages interactive  
   D) Database management
2. How do you declare a variable in JavaScript?  
   A) variable name;  
   B) var name;  
   C) let name;  
   D) Both B and C
3. Which of the following is a correct function declaration?  
   A) function = myFunc() {}  
   B) function myFunc() {}  
   C) declare function myFunc()  
   D) def myFunc()
4. How do you write a comment in JavaScript?  
   A) # comment  
   B) <!-- comment -->  
   C) // comment  
   D) \* comment \*
5. What keyword is used to check conditions?  
   A) if  
   B) when  
   C) unless  
   D) loop
6. What symbol is used for strict equality?  
   A) =  
   B) ==  
   C) ===  
   D) :=
7. What is the output of: typeof []?  
   A) array  
   B) object  
   C) list  
   D) undefined
8. How do you create an array in JavaScript?  
   A) let arr = {};  
   B) let arr = [];  
   C) let arr = ();  
   D) let arr = <>;
9. Which method adds an item to the end of an array?  
   A) push()  
   B) append()  
   C) insert()  
   D) add()
10. What does NaN stand for?  
    A) Not a Null  
    B) No assigned Number  
    C) Not a Number  
    D) Null and None
11. What will Boolean(0) return?  
    A) true  
    B) false  
    C) 0  
    D) null
12. What is the default value of a variable declared with let but not initialized?  
    A) null  
    B) 0  
    C) undefined  
    D) false
13. Which method is used to convert a string to an integer?  
    A) parseInt()  
    B) int()  
    C) Number()  
    D) toInteger()
14. How do you define a constant in JavaScript?  
    A) let  
    B) var  
    C) const  
    D) define
15. Which keyword is used to define an asynchronous function?  
    A) async  
    B) await  
    C) promise  
    D) sync
16. What does setTimeout() do?  
    A) Repeats a function  
    B) Stops execution  
    C) Delays execution  
    D) Pauses script
17. Which operator is used to spread values from arrays or objects?  
    A) ...  
    B) \*\*  
    C) =>  
    D) ~~
18. Which of these is a falsy value in JavaScript?  
    A) "false"  
    B) []  
    C) 0  
    D) "0"
19. How do you define an arrow function?  
    A) function() => {}  
    B) () => {}  
    C) => () {}  
    D) {} => ()
20. What will 2 + '2' return?  
    A) 4  
    B) 22  
    C) NaN  
    D) Error
21. Which method is used to remove the last element of an array?  
    A) shift()  
    B) unshift()  
    C) pop()  
    D) splice()
22. How do you round a number down in JavaScript?  
    A) Math.round()  
    B) Math.floor()  
    C) Math.ceil()  
    D) round.down()
23. Which keyword stops the execution of a loop?  
    A) stop  
    B) exit  
    C) break  
    D) return
24. What does JSON.stringify() do?  
    A) Parses a JSON string  
    B) Converts JS object to JSON string  
    C) Converts JSON to array  
    D) Validates JSON
25. What will be the output of typeof null?  
    A) null  
    B) object  
    C) undefined  
    D) false

## ✅ **Answer Key**

1. C
2. D
3. B
4. C
5. A
6. C
7. B
8. B
9. A
10. C
11. B
12. C
13. A
14. C
15. A
16. C
17. A
18. C
19. B
20. B
21. C
22. B
23. C
24. B
25. B

**Javascript ES6**

### **Multiple Choice Questions**

1. Which keyword is used to declare a block-scoped variable in ES6?  
   A) var  
   B) int  
   C) let  
   D) const
2. What does const declare?  
   A) A constant reference value  
   B) A value that can’t ever change  
   C) An object only  
   D) A variable for functions only
3. Arrow functions are introduced in:  
   A) ES5  
   B) ES6  
   C) ES7  
   D) ES2020
4. Which syntax is correct for an arrow function?  
   A) function => () {}  
   B) () -> {}  
   C) () => {}  
   D) {} <= ()
5. What is the output of: typeof Symbol()?  
   A) object  
   B) string  
   C) symbol  
   D) function
6. Which ES6 feature provides a default value for function parameters?  
   A) Optional arguments  
   B) Default parameters  
   C) Rest operator  
   D) Spread operator
7. How do you create a template literal in ES6?  
   A) 'Hello ${name}'  
   B) Hello ${name}  
   C) "Hello ${name}"  
   D) <<Hello ${name}>>
8. What does the spread operator do?  
   A) Combines strings  
   B) Spreads values in an array or object  
   C) Creates loops  
   D) Flattens arrays
9. What symbol is used for the spread operator?  
   A) ->  
   B) ...  
   C) \*\*\*  
   D) :::
10. What are template literals enclosed by?  
    A) Single quotes  
    B) Double quotes  
    C) Backticks  
    D) Parentheses
11. What does destructuring assignment allow you to do?  
    A) Merge objects  
    B) Extract values into variables  
    C) Delete variables  
    D) Loop through data
12. Which is correct for object destructuring?  
    A) let {name} = person;  
    B) let name = {person};  
    C) let name := person;  
    D) let name << person;
13. What are Promises used for in ES6?  
    A) Styling  
    B) Conditional logic  
    C) Asynchronous programming  
    D) Loops
14. How do you create a class in ES6?  
    A) create class MyClass {}  
    B) function class MyClass {}  
    C) class MyClass {}  
    D) var class = MyClass
15. Which method is used to define behavior in a class?  
    A) init()  
    B) constructor()  
    C) setup()  
    D) run()
16. Which keyword is used to inherit a class?  
    A) extend  
    B) inherits  
    C) super  
    D) extends
17. What does super() do?  
    A) Calls the parent constructor  
    B) Declares a super variable  
    C) Inherits methods  
    D) Accesses static methods
18. Which method handles errors in a promise chain?  
    A) .done()  
    B) .fail()  
    C) .catch()  
    D) .throw()
19. How can you create a Set in ES6?  
    A) let s = {};  
    B) let s = new Set();  
    C) let s = Set();  
    D) let s = new set();
20. Which property checks number of elements in a Set?  
    A) count  
    B) length  
    C) size  
    D) total
21. What is a Map in ES6?  
    A) An array method  
    B) A loop function  
    C) A key-value collection  
    D) A DOM element
22. How do you add a value to a Map?  
    A) map.put(key, value);  
    B) map[key] = value;  
    C) map.add(key, value);  
    D) map.set(key, value);
23. Which loop is used to iterate over Map or Set values?  
    A) for  
    B) for...in  
    C) for...of  
    D) foreach
24. What is the use of import in ES6?  
    A) Import data from database  
    B) Import stylesheets  
    C) Import functions/modules  
    D) Import variables from JSON
25. Which of the following exports a function from a module?  
    A) export = myFunc;  
    B) export function myFunc() {}  
    C) module.export myFunc;  
    D) function => export;

## ✅ **Answer Key**

1. C
2. A
3. B
4. C
5. C
6. B
7. B
8. B
9. B
10. C
11. B
12. A
13. C
14. C
15. B
16. D
17. A
18. C
19. B
20. C
21. C
22. D
23. C
24. C
25. B

**Typescript**

### **Multiple Choice Questions**

1. TypeScript is a superset of which language?  
   A) Java  
   B) JavaScript  
   C) Python  
   D) C++
2. What file extension is used for TypeScript files?  
   A) .js  
   B) .ts  
   C) .tsx  
   D) .typ
3. Which keyword is used to define a type alias?  
   A) alias  
   B) let  
   C) type  
   D) typedef
4. Which TypeScript feature allows specifying multiple types for a variable?  
   A) Intersection  
   B) Interface  
   C) Union  
   D) Composite
5. How do you specify a union type?  
   A) let x: number, string;  
   B) let x = number | string;  
   C) let x: number | string;  
   D) let x := number or string;
6. What does the any type mean in TypeScript?  
   A) Any number  
   B) Any data type  
   C) Only string  
   D) A constant
7. What command compiles TypeScript code?  
   A) tsc filename.ts  
   B) ts filename.ts  
   C) compile filename.ts  
   D) node filename.ts
8. Which keyword is used to define an interface in TypeScript?  
   A) contract  
   B) schema  
   C) interface  
   D) type
9. What is the default return type of a TypeScript function if none is specified?  
   A) void  
   B) any  
   C) unknown  
   D) number
10. How do you specify optional properties in an interface?  
    A) prop: string?  
    B) prop?: string  
    C) ?prop: string  
    D) prop: optional string
11. What is the TypeScript equivalent of null or undefined safety?  
    A) Non-null assertion  
    B) NullScript  
    C) NullGuard  
    D) Safety types
12. Which operator is used for non-null assertion?  
    A) ??  
    B) !  
    C) ?  
    D) =>
13. What type is returned by typeof in TypeScript?  
    A) The runtime type  
    B) A string literal  
    C) A TypeScript type  
    D) Both B and C
14. What is a tuple in TypeScript?  
    A) A fixed-size, ordered list of elements  
    B) A generic array  
    C) A set of interfaces  
    D) A class
15. Which syntax defines a tuple with a string and number?  
    A) [number, string]  
    B) (string, number)  
    C) [string, number]  
    D) <string, number>
16. What does readonly do in TypeScript?  
    A) Prevents reassigning a property  
    B) Hides a variable  
    C) Makes it private  
    D) Makes it optional
17. Can enums be defined in TypeScript?  
    A) Yes  
    B) No  
    C) Only using const  
    D) Only in interfaces
18. What keyword is used to define an enum?  
    A) enumeration  
    B) enum  
    C) const enum  
    D) define
19. What is the use of never type?  
    A) Represents infinite loops  
    B) Function that always returns  
    C) Function that never returns  
    D) A nullable return
20. Which is **not** a primitive type in TypeScript?  
    A) number  
    B) bigint  
    C) symbol  
    D) object
21. What does unknown type represent?  
    A) Like any but safer  
    B) Like null  
    C) Like void  
    D) Invalid type
22. What is the use of generic functions?  
    A) Dynamic object mapping  
    B) Type flexibility with safety  
    C) Convert types to strings  
    D) Use any type like any
23. Which syntax is used for generic types?  
    A) func<Type>()  
    B) func<>  
    C) func(type)  
    D) func-><T>()
24. What feature helps TypeScript infer types without explicit annotation?  
    A) Auto type  
    B) Smart inference  
    C) Type inference  
    D) Optional typing
25. What does as keyword do in TypeScript?  
    A) Exports a value  
    B) Converts a value to another type  
    C) Sets access modifier  
    D) Declares a variable

## ✅ **Answer Key**

1. B
2. B
3. C
4. C
5. C
6. B
7. A
8. C
9. B
10. B
11. A
12. B
13. D
14. A
15. C
16. A
17. A
18. B
19. C
20. D
21. A
22. B
23. A
24. C
25. B

**SQL**

### **Write SQL Queries for the Following:**

1. Write a query to fetch all records from a table named employees.
2. Write a query to get the names of employees whose salary is greater than 50,000.
3. Fetch all the distinct job roles from the employees table.
4. Get the total number of employees in the employees table.
5. Retrieve employees whose names start with 'A'.
6. Get employee details who joined between 2022-01-01 and 2023-01-01.
7. Find the highest salary in the employees table.
8. Retrieve the second highest salary from the employees table.
9. Get the average salary of employees in the department IT.
10. List the employees grouped by department along with the count in each department.
11. Write a query to sort employee names in descending order.
12. Write a query to get employees with NULL values in the manager\_id column.
13. Fetch employees with a salary between 30,000 and 60,000.
14. Update the salary of employee with id = 101 to 75,000.
15. Delete records from the employees table where department is HR.
16. Insert a new employee into the employees table.
17. Create a table named departments with columns: id, name.
18. Write a query to join employees and departments tables using department\_id.
19. Get the maximum, minimum, and average salary from the employees table.
20. Count how many employees are in each job role.
21. Write a query to fetch top 5 salaries from employees.
22. Write a query to rename the column emp\_name to full\_name.
23. Write a query to add a new column email to the employees table.
24. Write a query to remove the column phone\_number from the employees table.
25. Write a query to display the first 10 rows from the employees table.

**Table Details**

CREATE TABLE departments (

id INT PRIMARY KEY,

name VARCHAR(100) NOT NULL

);

INSERT INTO departments (id, name) VALUES

(1, 'HR'), (2, 'IT'), (3, 'Finance'), (4, 'Marketing');

CREATE TABLE employees (

id INT PRIMARY KEY,

name VARCHAR(100) NOT NULL,

salary DECIMAL(10, 2),

job\_role VARCHAR(100),

department\_id INT,

manager\_id INT,

joining\_date DATE,

FOREIGN KEY (department\_id) REFERENCES departments(id)

);

INSERT INTO employees (id, name, salary, job\_role, department\_id, manager\_id, joining\_date) VALUES

(101, 'Alice', 60000, 'Developer', 2, NULL, '2022-03-15'),

(102, 'Bob', 75000, 'Manager', 2, NULL, '2021-07-01'),

(103, 'Charlie', 45000, 'Analyst', 3, 102, '2023-01-10'),

(104, 'Diana', 52000, 'HR Executive', 1, NULL, '2022-10-25'),

(105, 'Ethan', 47000, 'Developer', 2, 102, '2023-05-18'),

(106, 'Fiona', 85000, 'Director', 4, NULL, '2020-02-01'),

(107, 'George', 30000, 'Intern', 2, 101, '2024-01-15'),

(108, 'Hannah', 67000, 'Finance Analyst', 3, 103, '2022-11-12'),

(109, 'Ian', 55000, 'HR Executive', 1, 104, '2023-04-01'),

(110, 'Jane', 72000, 'Marketing Lead', 4, 106, '2021-09-30');

**JavaScript Algorithm-Based Questions**

* 1. Write a function to reverse a string without using built-in methods.
  2. Write a function to check if a number is a palindrome.
  3. Implement a function that finds the factorial of a number.
  4. Write a function to find the nth Fibonacci number using recursion.
  5. Implement a function to check if a string is an anagram of another string.
  6. Write a function to check if a number is prime.
  7. Implement a function that returns the sum of digits of a given number.
  8. Write a function to find the maximum number in an array.
  9. Write a function to sort an array of integers in ascending order using the bubble sort algorithm.
  10. Implement a function to count the occurrences of a character in a string.
  11. Write a function to find the longest word in a sentence.
  12. Write a function to check if a string contains only unique characters.
  13. Implement a function to merge two sorted arrays into one sorted array.
  14. Write a function to find the first non-repeated character in a string.
  15. Write a function that removes duplicates from an array.
  16. Implement an algorithm to perform binary search on a sorted array.
  17. Write a function to calculate the GCD (Greatest Common Divisor) of two numbers.
  18. Write a function to find the missing number in an array containing numbers from 1 to n.
  19. Implement a function to find the second largest number in an array.
  20. Write a function to convert a Roman numeral to an integer.
  21. Write a function to find the intersection of two arrays.
  22. Implement a function to check if a string is a valid palindrome (ignoring spaces, punctuation, and case).
  23. Write a function to sum all the numbers in an array, but skip any numbers that are negative.
  24. Implement a function that finds the most frequent element in an array.
  25. Write a function to implement a simple hash table with methods insert, get, and remove.

### HTML CSS **Scenario-Based Questions**

1. **Scenario: Creating a Simple Web Page Layout** You are tasked with creating a basic webpage layout that includes a header, a navigation bar, a content section with some text and images, and a footer. The header and footer should have a background color, while the content section should be spaced nicely and contain both text and images.
   * **Question:** How would you structure the HTML and style the layout using CSS?
2. **Scenario: Responsive Navigation Bar** You need to build a navigation bar that appears as horizontal links on larger screens and as a stacked, vertical list on smaller screens. The navigation should switch based on the screen width.
   * **Question:** Write the HTML and CSS required to implement this responsive navigation bar.
3. **Scenario: Centering a Div** You have a div that contains some content like text and images, and you need to center this div both horizontally and vertically within the browser window.
   * **Question:** How would you center the div using HTML and CSS?
4. **Scenario: Image Gallery with Grid Layout** You are building an image gallery that should display images in a grid format on desktop screens (e.g., 4 columns). On smaller screens, the images should stack into a single column.
   * **Question:** Write the HTML and CSS to create this responsive image gallery.
5. **Scenario: Contact Form with Basic Validation** You need to create a contact form with fields for name, email, and message. The form should have a button that submits the data, and the email field should only accept a valid email format.
   * **Question:** How would you create the form in HTML and style it with CSS?
6. **Scenario: Fixed Header with Scrolling Content** You need to create a webpage where the header stays fixed at the top when scrolling down, while the content below the header can scroll.
   * **Question:** How would you implement a fixed header using HTML and CSS?
7. **Scenario: Button with Hover Effect** You need to create a button that changes color when hovered over and also has a subtle shadow effect.
   * **Question:** Write the HTML and CSS for the button and hover effect.
8. **Scenario: Creating a Card Component** You need to design a "card" component that displays an image at the top, a title underneath, and a short description at the bottom. The card should have a border, padding, and a subtle shadow effect.
   * **Question:** How would you create the HTML structure and style the card using CSS?
9. **Scenario: Customizing Form Input Fields** You need to create a login form with fields for username and password. The input fields should have a custom background color, border radius, and padding.
   * **Question:** How would you customize the form inputs using HTML and CSS?
10. **Scenario: Footer with Social Media Links** You need to create a footer that contains social media icons (e.g., Facebook, Twitter, Instagram) aligned horizontally. The icons should have a hover effect that changes their color.
    * **Question:** How would you structure the footer with social media links and style the icons with CSS?
11. **Scenario: Creating a Responsive Image** You need to add an image to a webpage. The image should be responsive, meaning it adjusts its size based on the screen width, without distorting the aspect ratio.
    * **Question:** Write the HTML and CSS to create a responsive image.
12. **Scenario: Creating a Simple Grid Layout** You need to create a layout where there are three sections (e.g., "About Us", "Services", "Contact") that should be displayed in a 3-column layout on larger screens, but should stack vertically on smaller screens.
    * **Question:** Write the HTML and CSS to implement this layout.
13. **Scenario: Modal Window** You need to create a modal window that appears when a button is clicked. The modal should contain a message and a close button. When the close button is clicked, the modal should disappear.
    * **Question:** How would you implement the modal using HTML and CSS?
14. **Scenario: Creating a Simple Footer with Copyright Text** You need to create a simple footer that contains the copyright text centered horizontally at the bottom of the page. The footer should have a background color and some padding.
    * **Question:** Write the HTML and CSS to create the footer.
15. **Scenario: Creating a Responsive Table** You need to create a table that displays a list of products. The table should be responsive, meaning on smaller screens, it should display as a single column of rows.
    * **Question:** Write the HTML and CSS to create this responsive table.
16. **Scenario: Styling a Navigation Bar** You need to style a navigation bar with links. The links should change color when hovered over, and the active link should have a different color. The navigation bar should be centered horizontally.
    * **Question:** How would you style the navigation bar using HTML and CSS?
17. **Scenario: Customizing a Checkbox** You need to create a custom-styled checkbox that changes color when checked. The checkbox should have rounded corners and a border.
    * **Question:** How would you style the checkbox using HTML and CSS?
18. **Scenario: Dropdown Menu** You need to create a dropdown menu that appears when you hover over a "Menu" link. The dropdown should contain additional links.
    * **Question:** Write the HTML and CSS to create the dropdown menu.
19. **Scenario: Creating a Back-to-Top Button** You need to create a "Back to Top" button that appears after the user scrolls down a certain amount. When clicked, it should smoothly scroll the user back to the top of the page.
    * **Question:** How would you implement the "Back to Top" button using HTML and CSS?
20. **Scenario: Creating a Simple Testimonial Section** You need to create a testimonial section where multiple testimonials are displayed in a row with the person’s name, their testimonial, and their photo.
    * **Question:** Write the HTML and CSS to create this testimonial section.

React.js Project-Based Scenario Questions

1. **Scenario: Todo List Application** You are asked to build a simple Todo List application where users can add, edit, delete, and mark tasks as completed. The tasks should be stored in local storage so that they persist even after a page refresh.

* **Question:** How would you implement the Todo List app using React? Which hooks and concepts would you use to handle state and local storage?

1. **Scenario: Dynamic Form Generation** You need to create a dynamic form that allows the user to add multiple fields (e.g., name, email, age). The user can dynamically add new fields and remove existing ones. The form data should be saved in a state and sent to the backend upon submission.

* **Question:** How would you implement dynamic form generation and handle adding/removing fields in React?

1. **Scenario: Fetching Data from an API** You are building an application that displays a list of users fetched from a remote API. The app should show a loading indicator while fetching the data and display an error message if the API request fails.

* **Question:** How would you implement data fetching from an API in React? What techniques would you use to handle loading, success, and error states?

1. **Scenario: User Authentication** You need to implement user authentication in your app. When the user logs in, their credentials are validated against an API, and they are redirected to a dashboard page upon successful login. If the credentials are incorrect, an error message is displayed.

* **Question:** How would you implement authentication in a React app, handle form submission, and manage the authentication state?

1. **Scenario: Creating a Modal Dialog** You need to implement a modal dialog that displays when a user clicks a button. The modal should contain a title, some content, and a close button. The modal should be implemented in such a way that it can be reused throughout the app.

* **Question:** How would you create a reusable modal component in React?

1. **Scenario: Routing and Navigation** You are building a multi-page application using React Router. The app has a homepage, a contact page, and a profile page. You also need to implement protected routes where only authenticated users can access certain pages.

* **Question:** How would you implement routing and protected routes in React using react-router-dom?

1. **Scenario: Product Catalog with Filtering and Sorting** You are building an e-commerce website with a product catalog. The products can be filtered by category and sorted by price or rating. You need to implement a filtering and sorting system that dynamically updates the displayed products.

* **Question:** How would you implement the filtering and sorting functionality in React?

1. **Scenario: Dark Mode Toggle** Your application should have a dark mode toggle that allows users to switch between light and dark themes. The selected theme should persist across sessions using local storage.

* **Question:** How would you implement dark mode functionality in a React app?

1. **Scenario: Infinite Scroll** You need to create a list of items (e.g., blog posts) that supports infinite scrolling. As the user scrolls to the bottom of the page, new items should be loaded automatically from the API.

* **Question:** How would you implement infinite scrolling in React?

1. **Scenario: Chat Application** You are building a real-time chat application using React. Users should be able to send messages, receive messages in real time, and display their chat history.

* **Question:** How would you implement real-time messaging in a React app? What tools would you use to handle real-time communication (e.g., WebSockets, Firebase)?

1. **Scenario: Drag-and-Drop Functionality** You need to build a task management app where users can drag and drop tasks between different columns (e.g., "To Do", "In Progress", "Done").

* **Question:** How would you implement drag-and-drop functionality in React?

1. **Scenario: State Management with Redux** You are working on a React app with complex state management needs, and you decide to use Redux to manage the app's global state. The app allows users to add items to their shopping cart and view the cart contents.

* **Question:** How would you implement Redux in this app? What actions, reducers, and store configuration would you create?

1. **Scenario: Responsive Layout with Flexbox** Your app needs to be responsive and should adapt to different screen sizes. You need to create a flexible layout that adjusts the number of columns based on the screen width.

* **Question:** How would you use Flexbox in React to create a responsive layout?

1. **Scenario: Form Validation** You need to implement form validation in your app. The form should include fields for a username, email, and password, and the user should be alerted if the form is submitted with invalid data.

* **Question:** How would you implement form validation in React?

1. **Scenario: Using Context API for Global State** You need to implement a global state management solution where users can toggle between light and dark themes across different components. You decide to use React's Context API.

* **Question:** How would you implement global state management using the Context API to handle the theme toggle?

1. **Scenario: File Upload Component** You need to create a file upload component that allows users to upload images. The component should show a preview of the selected image and provide an option to remove the image before uploading.

* **Question:** How would you implement a file upload component in React?

1. **Scenario: Pagination for Large Datasets** You are displaying a large dataset in your React app. You need to implement pagination so that only a subset of data is displayed on each page, and the user can navigate between pages.

* **Question:** How would you implement pagination in React?

1. **Scenario: Implementing a Countdown Timer** You need to implement a countdown timer that shows the time remaining until an event. The timer should update every second and stop once the time reaches zero.

* **Question:** How would you implement a countdown timer in React?

1. **Scenario: Building a News Feed** You are building a news feed for a social media app. The feed should display posts from different users, and each post can be liked, commented on, or shared.

* **Question:** How would you implement the news feed and handle interactions like liking and commenting?

1. **Scenario: Performance Optimization with React** You are building a React app that is experiencing performance issues when rendering large lists of items. You need to optimize the rendering process to improve the app's performance.

* **Question:** What performance optimizations would you apply in React to improve rendering large lists (e.g., virtualized lists)?