JS ROADMAP (BASIC TO ADVANCED)

□ Beginner Level JavaScript

1. Introduction & Basics

- What is JavaScript?
- How is it different from Java?
- How to include JavaScript in HTML? (inline, internal, external)

✅ **Practice Questions:**

- Write a script to display "Hello, World!" in the browser.
- How do you add comments in JS?

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2. Variables and Data Types

- var, let, const
- Primitive data types (String, Number, Boolean, null, undefined, BigInt, Symbol)

✅ **Practice Questions:**

- Difference between var, let, and const?
- What will be the output of typeof null?

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3. Operators

- Arithmetic, Comparison, Logical, Assignment, Ternary, Bitwise

✅ **Practice Questions:**

- Explain == vs ===.
- What does a && b return?

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4. Control Structures

- if, else, else if
- switch statement
- for, while, do...while loops

✅ **Practice Questions:**

- Print even numbers from 1 to 20.
- Write a program to find the largest of 3 numbers.

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5. Functions

- Function declaration & expression
- Arrow functions
- Parameters vs arguments
- Return statement

✅ **Practice Questions:**

- Write a function to check if a number is prime.
- What is the difference between regular and arrow functions?

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6. Arrays

- Creating arrays
- Common methods: push(), pop(), shift(), unshift(), splice(), slice(), join(), map(), filter(), reduce()

✅ **Practice Questions:**

- Reverse an array without using reverse().
- Find the sum of all elements using reduce().

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7. Objects

- Object literals
- Accessing/modifying properties
- this keyword (basic understanding)

✅ **Practice Questions:**

- Create an object for a student with name, age, and marks.
- Access nested object values.

□ Intermediate Level JavaScript

1. DOM Manipulation

- getElementById, querySelector
- Modifying content, attributes, styles
- Event handling (addEventListener)

✅ **Practice Questions:**

- Change background color on button click.
- Display input value on form submission.

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2. Events

- Mouse events, Keyboard events, Form events
- Event bubbling and capturing

✅ **Practice Questions:**

- What is event bubbling?
- How to stop propagation?

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3. Scopes and Closures

- Global vs Local scope
- Block scope with let and const

- Closures (returning functions)

✅ **Practice Questions:**

- What is a closure? Give an example.
- Can a closure retain access to a variable after its parent function has returned?

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4. ES6+ Features

- Template literals
- Destructuring
- Spread & Rest operators
- Default parameters
- let, const, arrow functions

✅ **Practice Questions:**

- Difference between spread and rest operators?
- Use destructuring to extract values from an object.

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5. Array & Object Methods (Advanced)

- find(), every(), some(), sort()
- Deep copying objects

✅ **Practice Questions:**

- Sort an array of objects by name.

- What is the difference between map() and forEach()?

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6. Error Handling

- try, catch, finally
- Throwing custom errors

✅ **Practice Questions:**

- Handle division by zero using try-catch.
- What happens if there's an error inside catch?

🔴 Advanced Level JavaScript

1. Asynchronous JavaScript

- setTimeout, setInterval
- Callbacks
- Promises
- async/await

✅ **Practice Questions:**

- Convert a callback-based function to a promise.
- What are the states of a Promise?

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2. Fetch API & AJAX

- Making HTTP requests using fetch()
- Handling JSON responses

✅ **Practice Questions:**

- Fetch user data from a public API and display it.
- Handle fetch errors properly.

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3. Object-Oriented JavaScript (OOP)

- Constructor functions
- Prototypes and inheritance
- Classes and objects
- super, extends

✅ **Practice Questions:**

- Create a class Car with properties and methods.
- Difference between class and prototype-based inheritance?

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4. JavaScript Execution Model

- Call Stack
- Event Loop
- Microtask queue

- Task queue

✅ **Practice Questions:**

- Explain the event loop with an example.
- What is the difference between microtask and macrotask?

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5. Modules

- import and export
- Default exports vs named exports

✅ **Practice Questions:**

- How do you export and import multiple functions in JS?

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6. Memory Management & Performance

- Garbage collection
- Memory leaks
- Debouncing & Throttling

✅ **Practice Questions:**

- Implement debouncing in JavaScript.
- What causes memory leaks in JS?

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7. Functional Programming Concepts

- Pure functions
- Higher-order functions
- Immutability
- Currying

✅ **Practice Questions:**

- Write a higher-order function.
- Implement currying for a simple add function.
