Generated MCQs

Q1: What is the primary role of the V8 engine in the context of Node.js?

A) To manage the event loop and asynchronous operations.

B) To provide a cross-platform runtime environment.

C) To compile and execute JavaScript code outside the browser.

D) To handle file system interactions and network requests.

Correct Answer: C

Q2: How does Node.js handle multiple concurrent user requests efficiently despite running in a single process?

A) By creating a new thread for each incoming request.

B) Through an event-driven, non-blocking I/O model.

C) By buffering all incoming data before processing.

D) By utilizing multiple V8 engines simultaneously.

Correct Answer: B

Q3: Which characteristic allows Node.js applications to handle tasks like file uploads efficiently without significant processing delays?

A) Highly scalable nature due to the event mechanism.

B) Single-threaded execution model.

C) Absence of data buffering, processing data in chunks.

D) Use of JavaScript for server-side applications.

Correct Answer: C

Q4: How does the Node.js process model fundamentally differ from the traditional web server model as described in the text?

A) Node.js uses a thread pool, while traditional servers use a single thread.

B) Node.js handles requests sequentially, while traditional servers handle them concurrently.

C) Traditional servers dedicate a thread per request, while Node.js uses a single thread with an event loop for I/O.

D) Traditional servers are asynchronous by default, while Node.js is synchronous.

Correct Answer: C

Q5: What underlying C library does Node.js use internally to manage its event loop and provide asynchronous I/O capabilities?

A) V8 Engine

B) libuv

C) NPM

D) ECMAScript

Correct Answer: B

Q6: Why is Node.js considered advantageous for developers already proficient in frontend JavaScript?

A) It automatically converts frontend code to backend code.

B) It allows using the same language (JavaScript) for both client-side and server-side development.

C) It eliminates the need for HTML and CSS in web applications.

D) It provides direct access to browser DOM elements on the server.

Correct Answer: B

Q7: When setting up a Node.js development environment, which tool is typically included with the Node.js installation itself (since version 0.6.0)?

A) A specific IDE like VS Code

B) The libuv library

C) Node Package Manager (NPM)

D) The V8 JavaScript Engine source code

Correct Answer: C

Q8: In the provided Node.js web server example using the 'http' module, what is the purpose of the `response.writeHead(200, {'Content-Type': 'text/plain'});` line?

A) To end the response and send it to the client.

B) To read the request headers from the client.

C) To write the main content ("Hello World") to the response body.

D) To set the HTTP status code and content type header for the response.

Correct Answer: D

Q9: Which of the following APIs, commonly available in browser-based JavaScript, is typically absent in a Node.js environment?

A) `console.log()`

B) `setTimeout()`

C) `JSON.parse()`

D) `document.getElementById()`

Correct Answer: D

Q10: What is the primary function of the Node.js REPL environment?

A) To package Node.js applications for deployment.

B) To install and manage external Node.js modules.

C) To provide an interactive shell for executing JavaScript code snippets and debugging.

D) To automatically compile TypeScript code into JavaScript.

Correct Answer: C

Q11: In the context of Node.js asynchronous operations, what is a callback function?

A) A function that blocks the execution until an I/O operation is complete.

B) A function passed as an argument to another function, to be executed upon completion of a task (like I/O).

C) A special function used only for handling errors in Node.js.

D) A built-in Node.js function for synchronous file reading.

Correct Answer: B

Q12: Consider the blocking vs. non-blocking code examples for reading 'input.txt'. Why does the non-blocking example print "Program Ended" before the file content?

A) The file reading operation failed, so it skipped printing the content.

B) `fs.readFile` starts the file reading and immediately returns control, allowing subsequent code to execute while I/O happens asynchronously.

C) The `console.log("Program Ended");` statement has higher priority in the event loop.

D) The blocking example uses an incorrect function call.

Correct Answer: B

Q13: When using the Node.js FS module, why is the asynchronous method (`fs.readFile`) generally preferred over the synchronous method (`fs.readFileSync`)?

A) Synchronous methods are deprecated in newer Node.js versions.

B) Asynchronous methods do not block the main execution thread, improving performance for concurrent operations.

C) Synchronous methods require manual error handling, while asynchronous methods handle errors automatically.

D) Asynchronous methods can read larger files than synchronous methods.

Correct Answer: B

Q14: What is the primary purpose of the Node.js Buffer class?

A) To manage the event queue for asynchronous operations.

B) To interact with raw binary data streams (like file system or network operations).

C) To store JavaScript string data more efficiently.

D) To provide utility functions for mathematical calculations.

Correct Answer: B

Q15: Which method would you use to combine two separate Node.js Buffer instances

into a single new Buffer?

A) `buf.copy()`

B) `buf.concat()`

C) `Buffer.concat()`

D) `buf.write()`

Correct Answer: C

Q16: In Node.js streams, which event is typically emitted when there is no more data to be read from a readable stream?

A) `data`

B) `error`

C) `finish`

D) `end`

Correct Answer: D

Q17: What does the term "piping" refer to in the context of Node.js streams?

A) Writing data directly to the console output.

B) Connecting the output of a readable stream directly to the input of a writable stream.

C) Compressing stream data using the 'zlib' module.

D) Handling errors that occur during stream operations.

Correct Answer: B

Q18: Based on the "Chaining the Streams" example, what is the role of `zlib.createGzip()`?

A) It's a readable stream that reads the original file.

B) It's a writable stream that writes the decompressed file.

C) It's a transform stream that compresses the data flowing through it.

D) It's a duplex stream used for network communication.

Correct Answer: C

Q19: According to the Web Application Architecture description, which layer is responsible for interacting directly with databases or other data sources?

A) Client Layer

B) Server Layer

C) Business Layer

D) Data Layer

Correct Answer: D

Q20: In the Node.js web server code that serves 'index.html', what module is used to parse the requested URL path?

A) `http`

B) `fs`

C) `url`

D) `path`

Correct Answer: C

Q21: What pattern does Node.js use for its event handling mechanism, where listener functions react to fired events?

A) Singleton Pattern

B) Factory Pattern

C) Observer Pattern

D) Decorator Pattern

Correct Answer: C

Q22: When using the `EventEmitter` class, which method is used to trigger or fire a specific named event?

A) `.on()`

B) `.addListener()`

C) `.emit()`

D) `.removeListener()`

Correct Answer: C

Q23: What is the purpose of the `fs.unlink(path, callback)` method in the Node.js FS module?

A) To create a symbolic link to a file.

B) To read the contents of a file.

C) To delete a file.

D) To rename a file.

Correct Answer: C

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