

PRACTICE PAPER SET 2

Web Computing (Paper Code: 48892)

T.E. Computer Engineering & AI-DS, Semester V

Duration: 3 Hours | Total Marks: 80

By: Nitin Gupta

Instructions to Candidates:

1. Question No. 1 is compulsory
2. Attempt any three questions from remaining five questions
3. Assume suitable data if necessary and justify the assumptions
4. Figures to the right indicate full marks

Q1. Answer the following questions: [20 Marks]

A. [5 Marks]

What is HTTP? Explain the HTTP request and response cycle with examples. Differentiate between GET and POST methods.

B. [5 Marks]

Write a JavaScript code to change the background color of a web page to different colors when buttons named "Red", "Blue", and "Green" are clicked.

C. [5 Marks]

Explain React JSX with suitable examples. How is JSX different from regular JavaScript?

D. [5 Marks]

Draw and illustrate 3-tier web architecture. Explain the role of each tier.

Q2. [20 Marks]

A. [10 Marks]

Explain the concept of React Hooks. What are the rules of using Hooks? Write code using `useState` and `useEffect` hooks to create a counter that:

1. Displays the count
2. Increments on button click
3. Shows an alert when count reaches 10

B. [10 Marks]

What are the different types of Node.js modules? Explain core modules, local modules, and third-party modules. Write an example demonstrating the use of the 'http' module to create a simple server.

Q3. [20 Marks]

A. [10 Marks]

Explain the working of the event loop along with different phases of Node.js with a neat diagram. Write an asynchronous file reading program in Node.js and explain its execution flow.

B. [10 Marks]

What are components in React? Explain the difference between class components and functional components. Create a class component "Student" that displays student name and roll number using state.

Q4. [20 Marks]

A. [10 Marks]

Write a Node.js program using Express to create a server that:

1. Handles GET request on route '/' to display "Home Page"
2. Handles POST request on route '/submit' to receive and display form data
3. Implements a 404 error handler for undefined routes
4. Includes proper error handling

B. [10 Marks]

Explain how React's `useEffect` hook can be used to perform side effects in functional components. Write a React component that:

1. Fetches data from a mock API when component mounts
2. Displays loading message while fetching
3. Displays the fetched data in a list
4. Includes error handling

Q5. [20 Marks]**A. [10 Marks]**

Differentiate between JSON and XML. Discuss their use cases and advantages in web development. Write an example of student data in both JSON and XML formats.

B. [10 Marks]

Explain the architecture of Flux in detail. How does it differ from traditional MVC? Describe the unidirectional data flow with a diagram.

Q6. [20 Marks]**A. [10 Marks]**

Write JavaScript code to validate a signup form with the following fields:

- Username (alphanumeric, 5-15 characters)
- Password (minimum 8 characters, must contain uppercase, lowercase, digit, and special character)
- Email (valid format with @ and .)
- Phone number (10 digits)
- Age (must be ≥ 18)

The form should not submit if any validation fails. Display specific error messages for each field.

B. [10 Marks]

Discuss the asynchronous nature of JavaScript. Explain how Node.js handles asynchronous operations using:

1. Callbacks
2. Promises

3. Async/Await

Provide code examples for each method demonstrating file reading operation.

END OF PAPER

Best of luck!

Compiled by: Nitin Gupta