PRACTICE PAPER SET 1

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]

Explain the working of DNS with its components. What are the steps involved in DNS resolution?

B. [5 Marks]

Write a JavaScript function that validates an email input field. The email must contain "@" and "." characters. Display appropriate error messages.

C. [5 Marks]

What are React Hooks? Explain the rules for using Hooks with examples of useState.

D. [5 Marks]

What is a callback in Node.js? Explain with a suitable example showing asynchronous behavior.

Q2. [20 Marks]

A. [10 Marks]

Explain the concept of state and props in React. How do they differ? Write a React component that uses both state and props to display a counter that increments when a button is clicked.

B. [10 Marks]

What is Express.js? Discuss the features and advantages of Express.js. Write code to create a simple Express server that responds with "Welcome to Web Computing" on the root route.

Q3. [20 Marks]

A. [10 Marks]

Explain the Document Object Model (DOM) and its levels. Write a JavaScript program that:

1. Accepts two numbers from the user
2. Displays their sum in a paragraph element
3. Changes the background color when the sum is displayed

B. [10 Marks]

Explain React Component Lifecycle with a suitable diagram. Discuss the mounting, updating, and unmounting phases with their important methods.

Q4. [20 Marks]

A. [10 Marks]

Compare and contrast MVC, FLUX, and Redux architectures. Explain their use in modern web applications with suitable diagrams.

B. [10 Marks]

Write a Node.js program using the fs module to:

1. Create a text file named "student.txt"
2. Write student information (name, roll number, marks) to the file
3. Read and display the contents of the file
   Explain the asynchronous approach used.

Q5. [20 Marks]

A. [10 Marks]

Explain the architecture of Node.js with a neat diagram. Describe the event-driven programming model and how Node.js handles multiple concurrent requests.

B. [10 Marks]

What is React Router? Explain how React Router can be used to create a single-page application (SPA). Write code to demonstrate routing between three pages: Home, About, and Contact.

Q6. [20 Marks]

A. [10 Marks]

Differentiate between ES5 and ES6. Explain the following ES6 features with examples:

1. Arrow Functions
2. Classes
3. Template Literals
4. Destructuring

B. [10 Marks]

Write JavaScript code to process an online registration form with the following validations:

- Name field should not be empty
- Email must contain "@" and "."
- Age must be between 18 and 60
- Password minimum 8 characters with at least one uppercase, one lowercase, and one number Display appropriate error messages for each validation failure.

END OF PAPER

Best of luck!

Compiled by: Nitin Gupta