MCA-I / Semester-II / Advance Web Development(2024-25)

Comprehensive Concurrent Evaluation -2 A

Faculty Name: Prof.Shweta Selokar

Subject: Advance Web Development

Subject Code: EC22-2

Sr. No.	Component	Marks	Last Date of Submission
1	**Written Home Assignment**	**25**	08th March 2025

Important Instructions:

1. The subject is evaluated on the basis of given component.
2. Assignments to be submitted in person.
3. Roll No, Student Name, Div, Contact number, Email-id, must be clearly mentioned.

Solve

Q1: Explain the **Node.js process model** and how it differs from traditional web servers. Provide an example scenario where Node.js is more efficient than a multi-threaded server.

Q2: Verify the installation of Node.js and test its basic functionality by executing relevant commands and interpreting their outputs.

1. Write the command to check the installed Node.js version and explain what the output signifies.
2. Describe the steps to open the Node.js REPL (interactive console) and explain one advantage of using it.
3. Inside the REPL, write a command to:
   - Multiply 5 by 8 and store the result in a variable.
   - Print the result with a message: "The product of 5 and 8 is: <result>

Q3: Describe core modules, local modules, and third-party modules and give two example of each type of module.

Q4: Explain EventEmitter class in Node.js, and how does it enable event-driven programming. Imports the events module and creates an EventEmitter instance, defines an event "newMessage" that takes a username and message as arguments and logs:"New message from <username>: <message>" , Emits the "newMessage" event with values "Alice" and "Hello, world!"

Q5: Write a complete Express.js program that:

1. Creates a web server running on port 3000.
2. Logs every incoming request's method and URL.
3. Responds with "Welcome to Node.js" when visiting /welcome.
4. Returns "404 - Page Not Found" for any undefined routes

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Comprehensive Concurrent Evaluation -2 B

Faculty Name: Prof.Shweta Selokar

Subject: Advance Web Development

Subject Code: EC22-2

Sr. No.	Component	Marks	Last Date of Submission
1	**Written Home Assignment**	**25**	**15ᵗʰ March 2025**

Important Instructions:

1. The subject is evaluated on the basis of given component.
2. Assignments to be submitted in person.
3. Roll No, Student Name, Div, Contact number, Email-id, must be clearly mentioned.

Solve

Q1: Define and explain the difference between primitive types and object types in TypeScript and Write a TypeScript function that takes a name (string) and age (number) as arguments and returns a formatted string:"Hello, my name is <name> and I am <age> years old." Modify the function to ensure that the age parameter is optional, and if not provided, it defaults to "unknown".

Q2: How does TypeScript's function overloading work? write a function signature for a function that accepts a string array and returns the longest string. Implement the function and ensure that it correctly handles an empty array by returning "No strings provided" instead of an error.

Q3 How does TypeScript ensure that an interface is correctly implemented by a class? Define a TypeScript interface User with the properties: id (number), name (string), email (string) Create a User class that implements this interface and includes a method getUserInfo() that returns: "User: <name>, Email: <email>"

Q4: Explain what generics are in TypeScript and why they are useful.Write a generic function getFirstItem<T>() that takes an array of any type T[] and returns the first item.

Q5: Write a TypeScript module named mathUtils.ts that exports a function calculateArea(radius: number): number, and import the function in another TypeScript file (main.ts) to calculate the area of a circle with radius 7.

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Comprehensive Concurrent Evaluation -2 C

Faculty Name: Prof.Shweta Selokar

Subject: Advance Web Development

Subject Code: EC22-2

Sr. No.	Component	Marks	Last Date of Submission
1	**Written Home Assignment**	**25**	20ᵗʰ March 2025

Important Instructions:

1. The subject is evaluated on the basis of given component.
2. Assignments to be submitted in person.
3. Roll No, Student Name, Div, Contact number, Email-id, must be clearly mentioned.

Solve

1. Explain the role of components in Angular and how they improve modularity. Write the command to generate a new component using Angular CLI and explain the files it creates.

2. What is the difference between structural and attribute directives in Angular? Write an example of using *ngIf to conditionally display a paragraph and ngClass to apply multiple styles dynamically.

3. Explain two-way data binding in Angular with an example. How is string interpolation different from property binding? Provide a scenario where each would be used.

4. Define pipes in Angular and explain the difference between pure and impure pipes. Write an Angular template that applies a date pipe and a currency pipe with formatting.

5. Design a basic template-driven form using Bootstrap with fields for name, email, and password. Explain how Angular handles SPAs and how it differs from traditional multi-page applications

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Comprehensive Concurrent Evaluation -2 D

Faculty Name: Prof.Shweta Selokar

Subject: Advance Web Development

Subject Code: EC22-2

Sr. No.	Component	Marks	Last Date of Submission
1	**Written Home Assignment**	**25**	25th March 2025

Important Instructions:

1. The subject is evaluated on the basis of given component.
2. Assignments to be submitted in person.
3. Roll No, Student Name, Div, Contact number, Email-id, must be clearly mentioned.

Solve

1. Explain the concept of Dependency Injection (DI) in Angular and how it enhances application modularity and create a service in Angular using Angular CLI, inject it into a component, and demonstrate its usage with an example.
2. Explain the difference between registering a service in root, module, and component providers. Provide a real-world example where you would register a service at the component level instead of the root.
3. Create a Reactive Form with the following fields: Name (required, min 3 characters), Email (valid email format), Age (number, must be greater than 18). Add custom validation for the age field that ensures only numbers above 18 are allowed. Write a function to display error messages for each field.
4. Explain difference between Promises and Observables in Angular. Implement a basic Observable that emits a sequence of numbers (1 to 5) with a 1-second delay between each emission.

5. Using HttpClient, write a function in Angular to:

- Make a GET request to fetch user data from "https://jsonplaceholder.typicode.com/users".
- Handle the response and display the users' names in an HTML list.
- Add error handling for failed requests.

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Comprehensive Concurrent Evaluation -2 E

Faculty Name: Prof.Shweta Selokar

Subject: Advance Web Development

Subject Code: EC22-2

Sr. No.	Component	Marks	Last Date of Submission
1	**Written Home Assignment**	**25**	28th March 2025

Important Instructions:

1. The subject is evaluated on the basis of given component.
2. Assignments to be submitted in person.
3. Roll No, Student Name, Div, Contact number, Email-id, must be clearly mentioned.

Solve

1. Explain Next.js, and how does it differ from React in terms of rendering and performance. Write the command to create a new Next.js application and explain the folder structure it generates.

2. Explain the difference between getStaticProps() and getServerSideProps() with an example. Implement a simple dynamic page in Next.js where the content changes based on the URL parameter.
   Explain why CSS Modules are preferred for component-level styling in Next.js. Create a Next.js component with a button styled using CSS Modules**.**

3. Describe Dynamic Routes in Next.js, and how do they differ from regular page routing. Create a Next.js API route (/api/products) that returns a JSON response with a list of products.

4. Explain the process of deploying a Next.js application on Vercel and also explain Image Optimization in Next.js and implement an example using the `<Image />` component.

5. Create a Next.js component with a button styled using CSS Modules. Explain why CSS Modules are preferred for component-level styling in Next.js.