Name: **Enrolment No:**	

UPES

End Semester Examination, May 2025

Course: Frontend Development **Semester: 4th**

Program: B.Tech Full Stack Development **Time : 03 hrs.**

Course Code: CSFS2003P **Max. Marks: 100**

Instructions: Attempt all questions

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Explain the difference between let, var, and const in JavaScript.	**4**	**CO1**
Q 2	Assess the importance of version control systems in frontend development. How does Git help in collaborative projects?	**4**	**CO1**
Q 3	Evaluate the importance of usability in web design. List three best practices.	**4**	**CO3**
Q 4	What is the difference between stateful and stateless components in React?	**4**	**CO3**
Q 5	What is the difference between authentication and authorization?	**4**	**CO4**

SECTION B
(4Qx10M= 40 Marks)

Q 6	Critically evaluate how the virtual DOM improves performance compared to direct DOM manipulation, and discuss scenarios where it might introduce new challenges.	**10**	**CO2**
Q 7	Evaluate the benefits and drawbacks of using CSS preprocessors (like Sass or Less) in large-scale projects. How do they affect the workflow, and what problems might arise during collaboration or deployment?	**10**	**CO2**
Q 8	Analyze the importance of caching and CDNs in web performance and security.	**10**	**CO3**
Q 9	Compare and contrast unit testing, integration testing, and end-to-end testing in the context of a React application. For each type, provide an example scenario and discuss the trade-offs in terms of coverage, speed, and reliability. **OR** Analyze the differences between task runners and module bundlers in the context of modern frontend development. When would you choose one over the other, and why?	**10**	**CO4**

SECTION-C (2Qx20M=40 Marks)			

Q 10	import React, { useState } from 'react';
	
	function ItemList() {
	  const [items, setItems] = useState(['Apple', 'Banana']);
	
	  const addItem = () => {
	  setItems([_____(1)_____, 'Orange']);
	  };
	
	  return (
	
	  {items.map((item, index) => (
	  <li key={_____(2)_____}>{item}
	  ))}
	
	  <button onClick={_____(3)_____}>Add Orange</button>
	
	  );
	}
	
	export default ItemList;
	
	Below is a partially completed React component. The component displays a list of items and should add "Orange" to the list when the button is clicked. However, some parts of the code are missing and are represented by blanks (***(1)***, ***(2)***, ***(3)***).
	a) Fill in the blanks (***(1)***, ***(2)***, ***(3)***) so that the component works as intended:
	• When the button is clicked, "Orange" is added to the end of the list.
	• Each list item has a unique key.
	b) Briefly explain the purpose of the useState hook and why a unique key is required in the list rendering.
	
	OR
	Below is a partially completed Redux action creator and reducer for a simple counter application. Some parts of the code are missing and are represented by blanks ((1), (2)).
	
	// Action
	const increment = () => ({
	  type: _____(1)_____
	});
		20	**CO4**

	// Reducer
	function counter(state = 0, action) {
	  switch (action.type) {
	  case 'INCREMENT':
	  return _____(2)_____;
	  default:
	  return state;
	  }
	}
	a) Fill in the blanks (***(1)***, ***(2)***) so that the action and reducer work as intended:
	• The action creator should return an action with the correct type.
	• The reducer should increment the state by 1 when the action is dispatched.
	b) Briefly explain the role of an action and a reducer in Redux.
	c) If the current state is 5 and the increment action is dispatched, what will be the new state?		

Q 11	a) Analyze the most common security threats faced by frontend applications How do these threats exploit vulnerabilities in client-side code? b) Propose a comprehensive security strategy for a new web application that handles sensitive user data. Your answer should address authentication, authorization, secure communication, and ongoing vulnerability management.	**10+10**	**CO4**