

CBCS SCHEME

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BIS601

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2026 Full Stack Development

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1			M	L	C
Q.1	a.	What is an array in Java Script? List out their key feature. Describe any three methods with example.	10	L2	CO1
	b.	Create an array of five cities and perform following operations in java script: i) Log total number of cities ii) Add new city at the end iii) Remove first city iv) Find the index of city	10	L3	CO1
OR					
Q.2	a.	Differentiate between primitive and non primitive data types.	10	L2	CO1
	b.	Write java script program for below i) Access only even numbers in the list ii) Check given string is polindrom	10	L3	CO1
Module – 2					
Q.3	a.	Define DOM. Discuss the below methods using Java Script. i) Selecting Element ii) Modifying Element iii) Adding Element	10	L2	CO2
	b.	Create a button in HTML with text "ClickMe". Add an event listener to log "Button clicked" to the console when button is clicked.	10	L3	CO2
OR					
Q.4	a.	What is an Events? Explain any three types of Events with example.	10	L2	CO2
	b.	Write a Java Script to select an image in your HTML and add a mouseover event listener to change its border color.	10	L3	CO2
1 of 2					

Module – 3

Q.5	a.	Define MERN. What are the components of MERN? Mention the usage of each component.	10	L2	CO3
	b.	What is Issue Tracker? Explain their usages.	10	L2	CO3

OR

Q.6	a.	Explain the process of server-less Hello world with example.	10	L2	CO3
	b.	Explain the composing components with new structure of UI.	10	L2	CO3

Module – 4

Q.7	a.	What is GraphQL? List out the advantages of GraphQL with example of GraphQL query.	10	L2	CO4
	b.	What are the different way to implement validations in GraphQL?	10	L2	CO4

OR

Q.8	a.	Explain different types of errors in UI to improve the user experience.	10	L2	CO4
	b.	What is Express? Brief note on Express.	10	L2	CO4

Module – 5

Q.9	a.	What is MongoDB? Explain the key feature of MongoDB collections.	10	L2	CO5
	b.	Explain MongoDB CRUD operations.	10	L2	CO5

OR

Q.10	a.	What is Aggregation in MongoDB? Explain different Aggregation operations with example.	10	L2	CO5
	b.	Explain different steps for reading from MongoDB.	10	L2	CO5

CMR INSTITUTE OF TECHNOLOGY
Department of Information Science and Engineering
Sixth Semester B.E/BTech Degree Examination .June/July 2026
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MODULE-1

Q.1	a	What is an array In JavaScript? List out their key feature. Describe any three methods with example. Solution: An array in JavaScript is a special variable used to store multiple values in a single variable. Key Features: • Stores multiple values in one variable • Can store different data types • Dynamic size (can grow/shrink) • Indexed (starts from 0) • Supports built-in methods 1.push() – Adds element at end let arr = [1, 2, 3]; arr.push(4); console.log(arr); // [1, 2, 3, 4] 2. pop() – Removes last element arr.pop(); console.log(arr); // [1, 2, 3] 3. shift() – Removes first element arr.shift(); console.log(arr); // [2, 3]	10	L2	CO1
	b	Create an array of five cities and perform the following operations in Java script. - Log total number of cities - Add new city at the end - Remove First City - Find the index of the city Solution : <pre>let cities = ["Delhi", "Mumbai", "Chennai", "Kolkata", "Bangalore"]; // i) Total number of cities console.log("Total cities:", cities.length); // ii) Add new city at end cities.push("Hyderabad"); console.log("After adding:", cities);</pre>	10	L3	CO1

		// iii) Remove first city cities.shift(); console.log("After removing first:", cities); // iv) Find index of a city let index = cities.indexOf("Chennai"); console.log("Index of Chennai:", index);																		
OR																				
Q2.	a	Differentiate between primitive and non-primitive data types. Solution : <table><tr><td>Feature</td><td>Primitive</td><td>Non-Primitive</td></tr><tr><td>Type</td><td>Basic data types</td><td>Complex objects</td></tr><tr><td>Examples</td><td>Number, String, Boolean</td><td>Array, Object</td></tr><tr><td>Storage</td><td>Stored by value</td><td>Stored by reference</td></tr><tr><td>Mutability</td><td>Immutable</td><td>Mutable</td></tr></table>	Feature	Primitive	Non-Primitive	Type	Basic data types	Complex objects	Examples	Number, String, Boolean	Array, Object	Storage	Stored by value	Stored by reference	Mutability	Immutable	Mutable	10	L2	CO1
Feature	Primitive	Non-Primitive																		
Type	Basic data types	Complex objects																		
Examples	Number, String, Boolean	Array, Object																		
Storage	Stored by value	Stored by reference																		
Mutability	Immutable	Mutable																		
	b	Write JAVA Script program for below a) Access only even numbers in the list b) Check given String is palindrome Solution : a) let nums = [1,2,3,4,5,6,7,8]; let even = nums.filter(n => n % 2 === 0); console.log("Even numbers:", even); b) function isPalindrome(str) { let reversed = str.split("").reverse().join(""); return str === reversed; } console.log(isPalindrome("madam")); // true console.log(isPalindrome("hello")); // false	10	L3	CO1															
MODULE-2																				
Q3.	a	Define DOM. Discuss the below methods using JavaScript: i) Selecting Element ii) Modifying Element iii) Adding Element Solution : DOM (Document Object Model) is a programming interface for HTML that allows JavaScript to access and modify web page content dynamically.	10	L2	CO2															

		Selecting Element let el = document.getElementById("demo"); ii) Modifying Element el.innerHTML = "Hello World"; iii) Adding Element let newEl = document.createElement("p"); newEl.innerText = "New Paragraph"; document.body.appendChild(newEl);			
	b	Create a button in HTML with text “ClickMe”. Add an event listener to log “Button clicked” to the console when button is clicked. Solution : <!DOCTYPE html> <html> <body> <button id="btn">ClickMe</button> <script> document.getElementById("btn").addEventListener("click", function() { console.log("Button clicked"); }); </script> </body> </html>	10	L3	CO2
OR					
Q4	a	What is an Events? Explain any three types of Events with example. Solution : Events are actions that occur in the browser (like click, hover, keypress). Click Event button.onclick = function() { alert("Clicked!"); };	10	L2	CO2

		2. Mouseover Event <pre>element.onmouseover = function() { console.log("Mouse over"); };</pre> 3. Keypress Event <pre>document.onkeypress = function() { console.log("Key pressed"); };</pre>			
	b	Write a JavaScript to select an image in your HTML and add a mouseover event listener to change its border color. Solution : <pre><!DOCTYPE html> <html> <body> <script> let image = document.getElementById("img"); image.addEventListener("mouseover", function() { image.style.border = "5px solid red"; }); image.addEventListener("mouseout", function() { image.style.border = "none"; }); </script> </body> </html></pre>	10	L3	CO2
MODULE-3					
Q.5	a	Define MERN. What are the components of MERN? Mention the usage of each component. solution: Components: 1. MongoDB – NoSQL database used to store data. 2. Express.js – Backend framework used to create APIs. 3. React.js – Frontend library used to build user interfaces. 4. Node.js – Runtime environment used to execute JavaScript on the server.	10	L2	CO3

		Architecture: React → Express + Node → MongoDB Advantages: ● Single programming language (JavaScript). ● Fast development. ● Scalable and flexible. Example: Online shopping websites, social media applications.			
	b	What is Issue Tracker ? Explain their usages. Solution: An Issue Tracker is a tool used to record, monitor, and manage bugs, tasks, and feature requests during software development. Uses: ● Bug tracking. ● Task assignment. ● Progress monitoring. ● Team collaboration. ● Project management. Examples: Jira, GitHub Issues, Bugzilla. Benefits: Improves productivity, software quality, and project tracking.	10	L2	CO3
OR					
Q.6	a	Explain the process of server-less Hello World with example solution: Serverless Computing allows execution of code without managing servers. Steps: 1. Create a function. 2. Deploy it to AWS Lambda/Azure Functions. 3. Connect using API Gateway. 4. Execute and get response. Example: <pre>exports.handler = async () => { return { statusCode: 200, body: "Hello World" }; };</pre> Advantages: Automatic scaling, low cost, easy deployment.	10	L2	CO3

	b	Explain the composing components with new structure of UI. solution: Component composition means combining smaller UI components to create larger interfaces. Example Structure: <pre> App ├─ Header ├─ Content └─ Footer </pre> Benefits: ● Reusability. ● Easy maintenance. ● Better code organization. React Example: <pre> <App> <Header /> <Footer /> </App> </pre>	10	L2	CO3
MODULE-4					
Q.7	a	What is GraphQL? List out the advantages of GraphQL with example of GraphQL query. solution: GraphQL is a query language for APIs that allows clients to request only the required data. Advantages: ● Single endpoint. ● Reduces over-fetching. ● Faster data retrieval. ● Strongly typed schema. Example Query: <pre> { student(id:1){ name branch } } </pre>	10	L2	CO4

		}			
	b	What are the different ways to implement validations in GraphQL? solution: Validation ensures correct and secure data entry. Types: 1. Schema Validation. 2. Input Validation. 3. Resolver Validation. 4. Custom Validation. 5. Authentication Validation. Example: name: String! ! indicates a mandatory field. Benefits: Data integrity and security.	10	L2	CO4
OR					
Q.8	a	Explain different types of errors in UI to improve the user experience. solution: 1. Validation Errors – Invalid input. 2. System Errors – Server failure. 3. Network Errors – Connectivity issues. 4. Permission Errors – Unauthorized access. 5. Form Errors – Missing required fields. Good UI Error Message Example: Please enter a valid email address. Benefits: Improves user experience and usability.	10	L2	CO4
	b	What is Express? Brief note on Express. solution: Express.js is a lightweight web framework for Node.js used to develop web applications and APIs. Features: ● Routing. ● Middleware support. ● REST API creation. ● Fast and scalable.	10	L2	CO4

		Example: <pre>app.get('/', (req,res)=>{ res.send("Hello Express"); });</pre> Advantages: Simple, flexible, and widely used.			
MODULE-5					
Q.9	a	What is MongoDB? Explain the key features of MongoDB collections. solution: MongoDB is a NoSQL database that stores data as documents. A Collection is a group of related documents. Features: ● Schema-less. ● Document-oriented. ● High scalability. ● Indexing support. ● Replication support. Example Document: <pre>{ "name":"Rahul", "age":20 }</pre>	10	L2	CO5
	b	Explain MongoDB CRUD operations. solution: CRUD stands for Create, Read, Update, Delete. Create db.students.insertOne({name:"Rahul"}) Read db.students.find() Update db.students.updateOne({name:"Rahul"}, {\$set:{age:21}}) Delete	10	L2	CO5

		db.students.deleteOne({name:"Rahul"}) CRUD operations are used to manage data in MongoDB.			
OR					
Q.10	a	What is Aggregation in MongoDB? Explain different Aggregation operations with example. solution: Aggregation is used to process and analyze data in MongoDB. Common Operations: • \$match – Filter documents. • \$group – Group documents. • \$sort – Sort results. • \$project – Select fields. Example: db.students.aggregate([{\$match:{branch:"ISE"}}]) Benefits: Reporting, analytics, and data summarization	10	L2	CO5
	b	Explain different steps for reading from MongoDB. solution: 1. Connect to MongoDB. 2. Select database. 3. Select collection. 4. Use find() to retrieve data. 5. Apply filters if required. 6. Sort and limit results. Example: db.students.find() Filtered Query: db.students.find({branch:"ISE"})	10	L2	CO5