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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VII - THEORY EXAMINATION (2025 - 2026)

Subject: Web Development using MERN Stack with DevOps

Time: 3 Hours

Max. Marks: 100

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of **three Sections -A, B, & C**. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A

20

1. Attempt all parts:-

- 1-a. The primary purpose of a Network Package Manager (NPM) is _____. (CO1, K2) 1
- (a) To manage and update hardware drivers
- (b) To monitor network traffic and security
- (c) To manage software packages and dependencies
- (d) To configure network protocols
- 1-b. Key advantage of using functional components in React are _____. (CO1, K1) 1
- (a) They have better performance compared to class components
- (b) They can manage component state more effectively
- (c) they can access the DOM directly
- (d) They are easier to debug
- 1-c. Select the benefits of using Google's Material Design and Material-UI in web development projects.(CO2, K2) 1
- (a) Faster development process
- (b) Consistent and visually appealing UI
- (c) Mobile responsiveness out of the box
- (d) All of the above
- 1-d. Select the primary purpose of a Navbar in a web or mobile application. (CO2, K2) 1
- (a) Display advertisements
- (b) Provide access to user account settings
- (c) Facilitate navigation between different sections or pages
- (d) Display random content

- 1-e. Which of the following extension is used to save the Node.js files. (CO3, K1) 1
- (a) .js
 - (b) .node
 - (c) .java
 - (d) .txt
- 1-f. Which of the following HTTP Status code means NOT FOUND, states that method is not available. (CO3, K1) 1
- (a) 400
 - (b) 401
 - (c) 404
 - (d) 409
- 1-g. Which of the following is not a part of DevOps lifecycle _____. (CO4, K2) 1
- (a) Operating
 - (b) Plan
 - (c) Build
 - (d) Code
- 1-h. What is the primary goal of a Continuous Integration and Delivery (CI/CD) pipeline? (CO4, K2) 1
- (a) Ensuring zero defects in the software
 - (b) Automating the deployment process
 - (c) Increasing the frequency of code reviews
 - (d) Reducing the number of development teams
- 1-i. Primary role of GitHub in MERN stack development with DevOps is: (CO5, K2) 1
- (a) Front-end development
 - (b) Version control and collaboration
 - (c) Database management
 - (d) Server configuration
- 1-j. The purpose of the "git clone" command is: (CO5, K2) 1
- (a) To create a new repository
 - (b) To delete a branch
 - (c) To copy an existing repository to a local machine
 - (d) To merge branches
2. Attempt all parts:-
- 2.a. Discuss functional components of React JS with example. (CO1, K2) 2
- 2.b. Specify the purpose of the COMMIT statement in SQL. (CO2, K1) 2
- 2.c. How cookies are different from sessions. (CO3, K2) 2
- 2.d. How can DevOps contribute to better customer satisfaction. (CO4, K2) 2
- 2.e. Describe the steps involved in deploying a MERN stack application to GitHub Pages. (CO5, K2) 2

SECTION-B

30

3. Attempt all parts:-	
3.a. Answer any <u>one</u> of the following:-	
3.a.(i) Discuss all the different phases of React component's lifecycle. (CO1, K2)	6
3.a.(ii) Explain the ways to apply validation on props in React. (CO1, K2)	6
3.b. Answer any one of the following:-	
3.b.(i) Explain the purpose of the AppBar in a web or mobile application. (CO2, K2)	6
3.b.(ii) Explain the advantages and disadvantages of statement-based replication and binary replication in database systems.(CO2, K2)	6
3.c. Answer any one of the following:-	
3.c.(i) Write the key features of Node.js.(CO3, K3)	6
3.c.(ii) Explain the role of the Model, View and Controller components in the MVC pattern? (CO3, K3)	6
3.d. Answer any one of the following:-	
3.d.(i) Name some popular DevOps tools and briefly explain their purposes.(CO4, K2)	6
3.d.(ii) Explain the Scrum methodology and its process flow.(CO4, K2)	6
3.e. Answer any one of the following:-	
3.e.(i) Explain three fundamental Git commands and briefly describe their functions. (CO5, K3)	6
3.e.(ii) Describe the process of creating a new job in Jenkins for a MERN stack project with example. (CO5, K3)	6
<u>SECTION-C</u>	50
4. Answer any <u>one</u> of the following:-	
4-a. Define React components. Differentiate between functional components and class components in React. (CO1, K3)	10
4-b. Describe the steps involved in creating a new React application using Create React App.Discuss the typical directory structure of a React project and explain the purpose of each directory. (CO1, K2)	10
5. Answer any <u>one</u> of the following:-	
5-a. Provide examples of tools or technologies used to implement caching in the MERN stack for improved scalability. (CO2, K3)	10
5-b. Discuss the challenges associated with maintaining data consistency and integrity in a dynamic schema environment. (CO2, K2)	10
6. Answer any <u>one</u> of the following:-	
6-a. Explain the role of the Hypertext Transfer Protocol (HTTP) in client-server communication in web development, and assess its impact on the efficiency and security of data exchange.(CO3, K3)	10
6-b. Explain the Significance of Template Engine and describe the key features of Express Framework? (CO3, K3)	10
7. Answer any <u>one</u> of the following:-	
7-a. Describe how collaboration and communication are fundamental DevOps principles. Provide real-world examples of their importance.(CO4, K2)	10

- 7-b. Provide an in-depth analysis of the differences between Agile and DevOps, highlighting their respective strengths and weaknesses for modern software development. (CO4, K2) 10
8. Answer any one of the following:-
- 8-a. Explain steps to deploy a MERN stack application on a Kubernetes cluster with example. (CO5, K3) 10
- 8-b. Discuss potential challenges and solutions related to container lifecycle management in a MERN stack development environment. (CO5, K2) 10

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