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

M.Tech Integrated

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. Choose which command is used to initialize a new Node.js project with NPM. (CO1, K1) 1
- (a) npm start
- (b) npm init
- (c) npm install
- (d) npm create
- 1-b. Purpose of the public directory in a React app is_____. (CO1, K2) 1
- (a) It contains static assets like HTML and CSS files.
- (b) It stores the JavaScript files for React components.
- (c) It hosts the database for the app.
- (d) It is used for unit testing React components.
- 1-c. Select the library that implements Material Design principles for React applications.(CO2, K2) 1
- (a) Materialize CSS
- (b) Bootstrap
- (c) Material-UI
- (d) Semantic UI
- 1-d. How can you create a Material-UI Button with a filled background.(CO2,K2) 1
- (a) variant="contained"
- (b) variant="outlined"
- (c) variant="text"

- (d) variant="filled"
- 1-e. In which language is Node.js written? (CO3, K2) 1
- (a) JavaScript
 - (b) C
 - (c) c++
 - (d) All of the mention
- 1-f. What is the main purpose of CAPTCHA in user authentication? (CO3, K2) 1
- (a) To verify a user's identity
 - (b) To protect against automated bots
 - (c) To store user credentials securely
 - (d) To encrypt user data
- 1-g. What are the key Components of Devops.(CO4, K1) 1
- (a) Continuous Testing
 - (b) Continuous Integration
 - (c) Continuous Delivery & Monitoring
 - (d) All of the above
- 1-h. What is the main purpose of sprint planning in Scrum? (CO4, K1) 1
- (a) A. To create a project timeline
 - (b) To define the product backlog
 - (c) To select and plan the work for the upcoming sprint
 - (d) To prioritize user stories
- 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. Which Git command is used to create a new branch in a repository? (CO5, K2) 1
- (a) git commit
 - (b) git branch
 - (c) git merge
 - (d) git pull
2. Attempt all parts:-
- 2.a. List types of Hooks in React JS. (CO1, K2) 2
- 2.b. List three advantages of Dynamic Schema.(CO2, K2) 2
- 2.c. Discuss MVC design Pattern. (CO3, K2) 2
- 2.d. How does Agile methodology differ from traditional project management approaches? (CO4, K2) 2
- 2.e. Illustrate a typical GitHub workflow in the context of MERN stack development.(CO5, K3) 2

SECTION-B

30

3. Attempt all parts:-
- 3.a. Answer any one of the following:-
- 3.a.(i) Explain the lifecycle methods of React components in detail. (CO1, K2) 6
- 3.a.(ii) Discuss with example where and how you would use React Router.(CO1, K3) 6
- 3.b. Answer any one of the following:-
- 3.b.(i) Name some common components available in Material-UI, and how can they be used.(CO2, K2) 6
- 3.b.(ii) Explain the purpose of creating an index on a database table and how it impacts query performance. (CO2, K2) 6
- 3.c. Answer any one of the following:-
- 3.c.(i) Illustrate Node.js and how does it differ from traditional JavaScript running in a web browser(CO3, K3) 6
- 3.c.(ii) Explain the role of middleware in the express framework. (CO3, K2) 6
- 3.d. Answer any one of the following:-
- 3.d.(i) Explain the core principles of Lean, ITIL, and Agile methodologies, and provide examples of scenarios where each methodology can be applied effectively. (CO4, K3) 6
- 3.d.(ii) Describe the stages of the DevOps lifecycle and explain the significance of each stage in delivering high-quality software. (CO4, K3) 6
- 3.e. Answer any one of the following:-
- 3.e.(i) Explain the difference between Git and traditional version control systems.(CO5, K3) 6
- 3.e.(ii) How does Jenkins support continuous integration in a MERN stack development environment? (CO5, K2) 6

SECTION-C 50

4. Answer any one of the following:-
- 4-a. Explain the typical directory structure of a React project and provide a brief description of each directory. (CO1, K2) 10
- 4-b. Discuss the differences between stateful and stateless components in React. When would you choose to use a stateful component over a stateless component, and vice versa. (CO1, K3) 10
5. Answer any one of the following:-
- 5-a. Explain how integrated caching can help improve the performance of a web application with a large user base.(CO2, K3) 10
- 5-b. How does the use of transactions help maintain data consistency and integrity in a database? (CO2, K3) 10
6. Answer any one of the following:-
- 6-a. Explain the use of cookies in session management.(CO3, K2) 10
- 6-b. Explain basic steps involved in creating a Rest API in Node.js with example. (CO3, K3) 10
7. Answer any one of the following:-
- 7-a. Describe the process flow of the Scrum methodology, including the roles, events, 10

and artifacts involved in a Scrum project. (CO4, K2)

- 7-b. Compare and contrast the Waterfall and Agile SDLC models. Explain when it's appropriate to use each model and the potential challenges associated with them. (CO4, K2) 10
8. Answer any one of the following:-
- 8-a. Identify and evaluate the key configuration settings required when setting up a Jenkins job with Git and Maven, and analyze their impact on the build and deployment process.(CO5, K4) 10
- 8-b. Describe the purpose of Docker in the context of MERN stack development with DevOps. (CO5, K2) 10

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