(b) Explain the concept and role of middleware in Express for handling requests and responses, and demonstrate its global use with app.use() in a short Express program. (7)

5. (a) How would you perform insert, delete, and update operations in MongoDB using Node.js? Write code examples for each operation. (8)

(b) Explain the concept of route parameters in Express and how they help manage similar requests. Describe four methods of passing parameters in routes. (7)

6. (a) Explain the architecture of Jenkins. Describe its key components and how they interact in a typical CI/CD pipeline. (8)

(b) Explain the differences between Git, GitHub, and GitLab. Highlight at least three key differences and their typical use cases. (7)

7. (a) What is the Project Object Model (POM) in Maven? Why is it important, and what are its main parts? (7)

(b) Explain the architecture of Docker. Describe the roles of Docker Engine, Docker Daemon, Docker Client, and Docker Images. (8)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 7805 **K**

Unique Paper Code : 6332493501

Name of the Paper : Full Stack Web Development-2

Name of the Course : **B.Voc. (Software Development)**

Semester : V

Duration : 3 Hours Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.

2. The paper has **two** sections. **Section A** is compulsory. Each question is of **5** marks.

3. Attempt any **four** questions from **Section B**. Each question is of **15** marks.

Section A

1. (a) What is Node.js? Explain any three key features of Node.js. (5)

   (b) Differentiate between synchronous and asynchronous file operations in Node.js. Provide examples of each. (5)

   (c) What is Jenkins, and what are its main features and primary purpose in software development? (5)

   (d) What is middleware in Express.js? Explain its types with examples. (5)

   (e) What is the Callback Queue in Node.js? Explain its role in the event-driven architecture of Node.js. (5)

   (f) What is the Maven build lifecycle? List and explain its three main lifecycles. (5)

Section B

2. (a) Explain the usage of the fs module in Node.js and write a program that performs the following tasks asynchronously: (8)

   (i) Create a new file named fruit.txt and write the contents of the array ['apple', 'orange', 'banana', 'grapes'] into it using asynchronous file writing.

   (ii) Read the contents of f ruit. txt and display them on the console.

   (iii) Append the string "mango" to fruit.txt.

   (b) Explain the working of the Event Loop in Node.js. Describe its different phases and the order in which they are executed. Illustrate your answer with a suitable diagram or example. (7)

3. (a) Explain how url.parse() helps in serving static files in Node.js, and write a server program using it to serve files from a public/folder. Return a 404 JSON error if a file is not found. (8)

   (b) Write and explain an example demonstrating Callback Chaining. How does chaining affect code readability and maintainability? (7)

4. (a) Explain how Basic HTTP Authentication works in Express using middleware. Write an Express program that authenticates users with the credential's username: testuser and password: test, and displays "Successful Authentication!" upon valid login. (8)