PG DEGREE EXAMINATION MAY 2026
(Third Semester)

TRANS DISCIPLINARY COURSE
(Common to PG Programmes)

DEVOPS METHODOLOGY AND TOOLS

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Which of the following best describes DevOps? A. A programming language B. A software development methodology C. A cloud storage service D. A version control system	K1	CO1
	2	What is the primary function of the `git push` command? A. To pull changes from the remote repository B. To view changes between commits C. To upload local changes to the remote repository D. To create a new branch	K2	CO1
2	3	Which directory in a Maven project typically contains the source code? A. /src B. /main C. /src/main/java D. /app/code	K1	CO2
	4	Which of the following best explains the role of Maven plugins? A. They control internet access B. They provide additional functionalities like compiling and testing C. They manage user authentication D. They handle memory management	K2	CO2
3	5	What does CI stand for in DevOps? A. Continuous Integration B. Code Implementation C. Continuous Infrastructure D. Core Integration	K1	CO3
	6	What does authorization in Jenkins help with? A. Starting the Jenkins server B. Managing access rights of users C. Building the application D. Writing Jenkins plugins	K2	CO3
4	7	Which file is commonly used to define a Jenkins pipeline? A. Jenkinsfile B. build.xml C. Dockerfile D. pipeline.xml	K1	CO4
	8	How does the notification system in Jenkins help in DevOps? A. It removes unnecessary builds B. It provides real-time feedback to teams about build status C. It delays build execution D. It stores backups of builds	K2	CO4
5	9	Which of the following best defines a "Pod" in Kubernetes? A. A container runtime B. A group of one or more containers C. A Kubernetes namespace D. A source control mechanism	K1	CO5
	10	What is the role of Namespaces in Kubernetes? A. To install plugins B. To run multiple Jenkins jobs C. To divide cluster resources between users D. To build Docker images	K2	CO5

Cont...

SECTION - B (35 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain the key principles of DevOps and describe how they help in improving the software development lifecycle.	K2	CO1
		(OR)		
	11.b.	Describe the function of the following Git commands with examples: add, diff, log, clone, and merge.		
2	12.a.	Apply the Maven build lifecycle to a small Java project and explain what actions are performed at each key phase (validate, compile, test, package, install, deploy).	K3	CO2
		(OR)		
	12.b.	You are assigned to test a Maven-based project. Demonstrate how you would execute tests and interpret the test output generated by Maven.		
3	13.a.	You are tasked with troubleshooting Jenkins issues in a CI pipeline. Given a situation where builds are failing due to misconfigured tools, explain how you would use Jenkins tool management features to resolve the issue.	K3	CO3
		(OR)		
	13.b.	Apply the concept of role-based authorization in Jenkins to restrict access for developers, testers, and admins. Create a use-case and define access levels for each role.		
4	14.a.	Analyze the components of a Jenkins pipeline. How do the stages, steps, and agents interact to achieve automation in the build process?	K4	CO4
		(OR)		
	14.b.	Examine how plugin management in Jenkins affects the stability and flexibility of a CI/CD pipeline. What risks can arise from poorly managed plugins?		
5	15.a.	Compare and contrast Pods, ReplicaSets, and Deployments in Kubernetes in terms of their purpose, lifecycle management, and real-world application.	K4	CO5
		(OR)		
	15.b.	Evaluate the networking model of Kubernetes, focusing on how Pods communicate internally and externally, and the role of CNI (Container Network Interface) plugins.		

SECTION -C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Identify and analyze the technical challenges organizations face when implementing DevOps. Propose strategies to overcome at least two of these challenges.	K4	CO1
2	17	A Maven project is failing during the build process due to missing or incompatible dependencies. Analyze how Maven handles dependency management and explain how such issues can be identified and resolved.	K4	CO2
3	18	Discuss the process of user management in Jenkins with a focus on authentication using Jenkins' own database. Analyze the security implications and limitations of using this method compared to external authentication systems.	K4	CO3
4	19	You are setting up a CI/CD pipeline for a microservices-based project. Evaluate how Jenkins Pipelines and plugin management can be used effectively to streamline the build and deployment process.	K5	CO4
5	20	Evaluate the effectiveness of Kubernetes cluster architecture in managing large-scale containerized applications. Justify your answer with examples and best practices.	K5	CO5

Z-Z-Z END