R22 Regulation *Subject code: 4P5GC&4E5HC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech V Semester Regular/Supplementary Examinations, November 2025

DevOps

(Common to CSE(AI&ML) & CSE(DS))

Maximum Marks: 60 Date:10.11.2025 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	BloomTx
1.a)	Define Continuous Delivery.	1M	1	L1
b)	Name one technique for identifying bottlenecks in a delivery pipeline	1M	1	L1
c)	Give one example of an Architecture Rule of Thumb	1M	2	L2
d)	How does DevOps influence resilience in architecture?	1M	2	L2
e)	Mention two reasons for the need for source code control	1M	3	L2
f)	What is the primary role of Gerrit in a Git workflow?	1M	3	L2
g)	What are Build Slaves in the context of Jenkins?	1M	4	L2
h)	Distinguish between a trigger and a Job chaining in a build system.	1M	4	L2
i)	Define Test-Driven Development (TDD).	1M	5	L1
j)	Name one virtualization stack used in system deployment.	1M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BloomTx
2	a) Explain the DevOps process and its role in achieving Continuous Delivery b) Classify and explain the various types of bottlenecks that can occur in a delivery pipeline. For example, describe a common bottleneck in the testing phase and propose a solution using a DevOps practice.	5M 5M	1	L3
	OR			
3	a) Compare and contrast the Scrum and Kanban methodologies used in Agile development. b) Illustrate the relationship between DevOps and the Agile development model. How do they complement each other to achieve faster, reliable releases?	5M 5M	1	L3
4	a) Apply the concept of separation of concerns to design a software architecture in a DevOps environment. For example, detail how a microservices architecture uses this principle to enhance business agility.	5M	2	L3

	b) Discuss the influence of DevOps practices on software architecture, focusing on the handling of Microservices and the data tier.	5M		
	OR			
5	a) Develop a strategy for handling database migrations in a continuous delivery pipeline to minimize downtime and risk b) Explain the concept of DevOps and Continuous Testing. Why is continuous testing vital for ensuring a resilient software architecture?	5M 5M	2	L3
6	a) Make use of an example workflow to model how a pull request model works when using GitLab. b) Explain the history and roles associated with source code management, detailing how these roles interact in a modern development team.	5M 5M	3	L3
	OR			
7	a) Outline the functionalities of Hosted Git Servers (like GitHub/GitLab) and discuss the importance of shared authentication in these platforms. b) Analyze the process of a Source Code Management system migration. For example, describe the key challenges and planning steps when migrating from an older system (like SVN) to Git.	5M 5M	3	L3
8	a) Analyze how Infrastructure as Code is implemented with build servers. For example, explain how a Jenkins server configuration might be managed using a tool like Ansible or Puppet. b) Examine the importance of managing build dependencies and discuss strategies for ensuring consistent, reliable builds.	5M 5M	4	L3
	OR			
9	a) Describe the concept of Job Chaining and Build Pipelines in Jenkins and explain how they facilitate effective system integration. b) Demonstrate advanced proficiency by describing the typical Jenkins plugins and file system layout. How are plugins vital for extending Jenkins' capabilities?	5M 5M	4	L3
10	a) List the various types of testing and evaluate the pros and cons of test automation. b) Determine the deployment strategy using Puppet Master and Agents. How does this approach differ from the deployment using Ansible (which is typically agentless)?	5M 5M	5	L3
	OR			
11	a) Explain the features of Selenium for frontend testing. How is JavaScript testing used for backend integration points? b) Assess the deployment strategies using virtualization stacks versus container orchestration (Docker). For example, compare the resource usage and startup time of a VM-based deployment versus a Docker container deployment.	5M 5M	5	L3