Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – December 2025

Date: 05-12-2025 **Time:** 01:00pm – 04:00pm

School: SOCSE	**Program:** Computer Science and Technology (DevOps)	
Course Code : CDV3403	**Course Name:** Infrastructure as code with terraform and Ansible	
Semester: VII	**Max Marks**:100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**26**	**24**	**26**	**24**	

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	What is resource provisioning in a cloud environment?	**2 Marks**	**L1**	**CO1**
2.	List two challenges IaC helps to solve	**2 Marks**	**L1**	**CO1**
3.	Why is version control essential for IaC?	**2 Marks**	**L1**	**CO1**
4.	What is the terraform plan command used for?	**2 Marks**	**L1**	**CO2**
5.	What is a resource block in a Terraform configuration?	**2 Marks**	**L1**	**CO2**
6.	Explain the concept of dependency management in Terraform	**2 Marks**	**L1**	**CO3**
7.	What is the difference between a static and a dynamic inventory in Ansible?	**2 Marks**	**L1**	**CO3**
8.	What is the purpose of the ansible.cfg file?	**2 Marks**	**L1**	**CO3**
9.	Explain 'load balancing' in the context of a real-world scenario.	**2 Marks**	**L1**	**CO4**
10.	Name two CI/CD tools that can be used to automate IaC workflows	**2 Marks**	**L1**	**CO4**

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	Explain the difference between Infrastructure as Code, Configuration Management and Orchestration.	**10 Marks**	**L2**	**CO1**
	b.	Discuss the role of IaC in enabling a DevOps culture. How does it help in bridging the gap between Development and Operations teams?	**10 Marks**	**L2**	**CO1**
		Or			
12.	**a.**	Compare the agent-based architecture with the agentless architecture What are the pros and cons of each?	**10 Marks**	**L2**	**CO1**
	b.	Describe the core components of infrastructure in a modern public cloud provider. Explain how IaC provides a way to manage these components as code.	**10 Marks**	**L2**	**CO1**

13.	**a.**	Analyze the best practices for writing clean, maintainable, and scalable Terraform code.	**10 Marks**	**L2**	**CO2**
	b.	You are given a task to provision a virtual machine and a storage bucket, where the VM needs the bucket's name as an environment variable. Analyze how you would manage this data flow in Terraform using variables, outputs, and resource interpolation.	**10 Marks**	**L2**	**CO2**
		Or			
14.	**a.**	Analyze the lifecycle of a Terraform resource. Explain what create, read, update, and delete operations mean in the context of a provider and the state file.	**10 Marks**	**L2**	**CO2**
	b.	Compare and contrast input variables and output values Analyze how they work together to create a self-contained, reusable Terraform module.	**10 Marks**	**L2**	**CO2**

15.	**a.**	Explain the concept of Idempotency in Ansible. Why is this a desirable feature for a configuration management tool? Provide an example of a task that is idempotent and one that is not.	**10 Marks**	**L2**	**CO3**
	b.	Write a simple Ansible playbook that uses the shell module to execute a command. Then, explain the risks of using the shell or command module versus using a dedicated Ansible module	**10 Marks**	**L3**	**CO3**
		Or			
16.	**a.**	Illustrate the structure of an Ansible inventory file. Show how to define host groups, group variables, and host-specific variables.	**10 Marks**	**L2**	**CO3**

	b.	Write an Ansible playbook that demonstrates the use of a handler. The playbook should modify a configuration file and then notify a handler to restart the sshd service.	**10 Marks**	**L3**	**CO3**

17.	**a.**	Apply your knowledge to describe how you would use IaC to provision a secure network on a cloud	**10 Marks**	**L3**	**CO4**
	b.	Explain how you would then use Ansible to configure web servers that are launched into the private subnets.	**10 Marks**	**L2**	**CO4**
Or					
18.	**a.**	Describe the challenge of managing sensitive data like database passwords or API keys within an IaC workflow.	**10 Marks**	**L2**	**CO4**
	b.	Explain how a tool like HashiCorp Vault can be integrated with Terraform and Ansible to securely inject secrets at runtime, avoiding the need to store them in version control.	**10 Marks**	**L2**	**CO4**