

## **PART I**

### **Unit 1: Introduction to DevOps**

- a. DevOps Overview
- b. The relationship between Agile and DevOps
- c. DevOps Toolchain
- d. Challenges with the Traditional Approach
- e. Addressing Challenges through DevOps
- f. Categories of DevOps Tools
- g. Linux and Shell Scripting Basics
- h. Knowledge Check

### **Unit 2: Version Control Systems**

- a. Overview of Version Control Systems
- b. Benefits of version control systems
- c. Role of Version Control Systems
- d. Types of Version Control Systems
- e. Overview of Git
- f. Advantages of Git: Performance, Security, Flexibility
- g. File Status Lifecycle in Git
- h. Creating a GitHub Account
- i. Install Git on Windows
- j. Configuring Git and Verifying
- k. Starting a New Local Repository with Git
- l. Git Commits
- m. Tracking Files with Git
- n. Staging Files with Git
- o. Removing files from the staging area
- p. Committing Changes to Git
- q. Push Pull to and From a Remote Repository

- r. Working with Branches

### **Unit 3: Continuous Integration, Continuous Deployment, and Build Tools**

- a. Overview and Importance of Continuous Integration and Continuous Deployment
- b. Overview and Features of Jenkins
- c. Set up Jenkins
- d. Configure Jenkins
- e. Configure Plugins
- f. Creating Users and Secure Access
- g. Configure a job
- h. Creating and Configuring Node
- i. Running build on Node
- j. Overview of Maven
- k. Installing Maven
- l. Maven Goals and Phases
- m. Build a web app using Maven
- n. Deploy the build with Jenkins
- o. Creating a downstream job
- p. Trigger the downstream job
- q. Jenkins file
- r. Create a pipeline using a Jenkins file

### **Unit 4: Configuration Management Tools**

- a. Overview of Configuration Management Tools
- b. Managing Infrastructure
- c. Types of Configuration Management Tools
- d. **Overview of Puppet**
  - i. Features of the Puppet System

- ii. Puppet – Workflow
- iii. Puppet – Key Components
- iv. Puppet architecture
- v. Puppet Master Config File
- vi. Resource Type
- vii. Installing and configuring Puppet Master
- viii. Installing and configuring Puppet Agent
- ix. Run a Manifest and check facts on the Agent

e. **Overview of Chef**

- i. Chef – Workflow
- ii. Chef – Key Components
- iii. Workstation Setup
- iv. Server Setup
- v. Node Setup
- vi. Hosted Chef – Creating an account
- vii. Configure Hosted Chef
- viii. Chef Development Kit
- ix. Chef Starter Kit
- x. Install and Configure Development Kit
- xi. Knife Setup
- xii. Chef CookBooks
- xiii. Chef – Testing Cookbook on Node

f. **Overview of Ansible**

- i. Ansible Workflow
- ii. Installation Process
- iii. Ansible inventory files
- iv. Ansible modules
- v. Parallelism and Shell Commands
- vi. Facts

- vii. Playbooks
- viii. Create a Playbook

## **Unit 5: Terraform**

- a. Terraform Introduction
- b. Install and Configure Terraform
- c. Ansible V/S Terraform
- d. Configure AWS EC2 instances using Terraform
- e. HCL Terraform language

## **Unit 6: Containerization with Docker and Kubernetes**

- a. Docker – Overview
- b. Components of Docker
- c. Docker Engine
- d. Docker Hub
- e. Docker Compose
- f. Installing Docker on Linux
- g. Docker – Images
- h. Docker – Containers
- i. Working with Containers
- j. Docker – File
- k. Building Files
- l. Building a Web Server Docker File
- m. Docker – Swarm
- n. Kubernetes Architecture
- o. Main Components of Kubernetes
- p. Install Kubernetes and Cluster Initialization
- q. Autoscaling in Kubernetes
- r. Test Cluster by deploying Nginx

## **Unit 7: Jfrog Artifactory**

- a. Introduction to Artifactory
- b. Difference between Code repo and Artifactory
- c. Install and Configure Artifactory
- d. Integrate Artifactory with Jenkins
- e. Directory types

## **Unit 8: Continuous Monitoring**

- a. Continuous Monitoring
- b. What is Nagios
- c. Nagios – Products
- d. Nagios – Installation
- e. Nagios – Configuration
- f. Nagios – Features
- g. Hosts and Services
- h. Commands
- i. Active and Passive Checks
- j. Nagios – NRPE

## **Unit 9: Log Management with ELK**

- a. ELK Stack
- b. What is Elasticsearch?
- c. What is Logstash?
- d. What is Kibana?
- e. What are Beats?
- f. Why Log Analysis?
- g. ELK vs. Splunk
- h. Install and configure ELK
- i. Install and configure Filebeat

## **Unit 10: Need for Cloud in DevOps**

- a. Infrastructure as a service (IaaS)

- b. Platform as a service (PaaS)
- c. Software as a service (SaaS)
- d. Types of Cloud Computing
- e. Private, Public, and Hybrid Cloud
- f. Introduction to AWS
- g. Simple monthly calculator
- h. EC2 instances
- i. S3 storage
- j. AWS AMI
- k. Identity and Access Cloud Management (IAM)
- l. Virtual private (VPC)

## **PART II**

### **Unit-1: Advanced Concepts & Real-Time Scenarios**

Create an AWS VPC with private and public subnets using Terraform.

End-to-end automated build and release with Git, Jenkins, Maven,

Ansible, and AWS EC2.