

DEVOPS
(CSEN 4122)

Time Allotted : 2½ hrs

Full Marks : 60

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 4 (four) from Group B to E, taking one from each group.*

Candidates are required to give answer in their own words as far as practicable.

Group – A

1. Answer any twelve:

12 × 1 = 12

Choose the correct alternative for the following

- (i) What does CI in CI/CD stand for?
 - (a) Continuous Input
 - (b) Continuous Integration
 - (c) Continuous Improvement
 - (d) Continuous Installation.
- (ii) Which of the following is a benefit of implementing DevOps?
 - (a) Slower release cycles
 - (b) Less collaboration between teams
 - (c) Reduced recovery time after failures
 - (d) Increased infrastructure cost.
- (iii) What is a merge conflict?
 - (a) An error in the Git configuration
 - (b) A disagreement among team members
 - (c) Overlapping changes between branches
 - (d) An issue with remote repository synchronization.
- (iv) What is a pipeline in Jenkins?
 - (a) A set of plugins that provide additional functionality to Jenkins
 - (b) A series of automated steps that build, test, and deploy software
 - (c) A graphical user interface for managing Jenkins
 - (d) A feature that allows users to create and manage Jenkins jobs.
- (v) What is the purpose of the Jenkins CLI?
 - (a) To provide a command-line interface for Jenkins
 - (b) To enable Jenkins to communicate with external systems
 - (c) To manage the configuration of Jenkins
 - (d) To generate reports on the status of Jenkins jobs.
- (vi) What command is used to list all running Docker containers?
 - (a) docker list
 - (b) docker show
 - (c) docker ps
 - (d) docker display.

- (vii) Which one of the following can be considered as the primary data store of Kubernetes?
 (a) Pod (b) Node (c) Etcd (d) None of the above.
- (viii) Which module is commonly used to start and enable services in Ansible?
 (a) `service` (b) `start-service`
 (c) `systemctl` (d) `enable-service`.
- (ix) What is the purpose of creating a Key Pair in AWS?
 (a) To launch an instance (b) To create an AMI
 (c) To establish SSH connection (d) To configure Security Group.
- (x) What is idempotency in Ansible?
 (a) Ability to run a task multiple times without changing the result
 (b) Ensuring the playbook runs only once
 (c) Running tasks in parallel
 (d) Ignoring errors during playbook execution.

Fill in the blanks with the correct word

- (xi) _____ command to view the differences between the working directory and the last commit.
- (xii) _____ is used to enable Jenkins to communicate with external systems.
- (xiii) The _____ DevOps tool is known for its "Infrastructure as Code" capabilities.
- (xiv) The purpose of _____ in Kubernetes is to duplicate pods.
- (xv) In Ansible, the _____ module is used to create or remove files and directories.

Group - B

2. (a) Why Agile model is preferred over the Waterfall model? *[[CSEN4122.1](Analyse/IOCQ)]*
 (b) Is there any difference between the Lean & Agile models? Explain it briefly. *[[CSEN4122.1](Analyse/IOCQ)]*
6 + 6 = 12
3. (a) What is the command that is used to check the difference between the staging area and the local copy of the repository? *[[CSEN4122.2](Remember/LOCQ)]*
 (b) What is the command to view the history of the commits? *[[CSEN4122.2](Remember/LOCQ)]*
 (c) How to roll-back to your previous commit? *[[CSEN4122.2](Remember/LOCQ)]*
 (d) State the differences between git revert and git reset. *[[CSEN4122.2](Apply/IOCQ)]*
2 + 2 + 4 + 4 = 12

Group - C

4. (a) Create a Jenkins pipeline that will PUSH your local repository to your Git-Hub repository. *[[CSEN4122.3, .6](Apply/HOCQ)]*

- (b) Show the workflow to achieve CI/CD (Continuous Integration / Continuous Deployment) in Jenkins. [[CSEN4122.3,.6](Apply/IOCQ)]
8 + 4 = 12
5. (a) What are plugins and how do plugins add value to Jenkins? [[CSEN4122.2,.3](Understand/LOCQ)]
- (b) What are the steps to do the following?
- (i) Check for plugins already installed.
 - (ii) Search for a particular plugin
 - (iii) Install the plugin
 - (iv) Restart Jenkins after installation.
- [[CSEN4122.2](Remember/LOCQ)]
4 + (2 × 4) = 12

Group - D

6. (a) Show the workflow (with an example) to implement a Docker-container. [[CSEN4122.3,.4,.5](Apply/IOCQ)]
- (b) What are the commands to:
- (i) List all local docker images
 - (ii) Run a specified docker image
 - (iii) Delete a specific container
 - (iv) Get a list of commands executed in a docker container
 - (v) To connect a running Docker Container to an existing Network.
- [[CSEN4122.3,.5](Remember/LOCQ)]
2 + (5 × 2) = 12
7. (a) What is Kubernetes? [[CSEN4122.1,.2](Remember/LOCQ)]
- (b) Explain the Kubernetes architecture. [[CSEN4122.2,.5](Remember/LOCQ)]
- (c) What are the key components of the Kubernetes architecture? [[CSEN4122.2,.5](Understand/LOCQ)]
3 + 4.5 + 4.5 = 12

Group - E

8. (a) With respect to Ansible what is remote machine and control machine. [[CSEN4122.1,.2](Understand/LOCQ)]
- (b) With respect to Ansible explain any four of the following concepts:
- (i) Inventory
 - (ii) Task
 - (iii) Handlers
 - (iv) Role
 - (v) Modules.
- [[CSEN4122.2,.3](Remember/LOCQ)]
4 + (4 × 2) = 12
9. (a) Explain the working principle of Ansible. [[CSEN4122.2,.6](Understand/LOCQ)]
- (b) What are the two types of machines that a DevOps system must have? What is their significance in a DevOps system? [[CSEN4122.2,.5](Remember/LOCQ)]

(c) Give an example of a YAML script representing a list of dictionaries.

[[CSEN4122.2, .3, .4](Apply/IOCQ)]

4 + 4 + 4 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	64.6	27	8.4