Hall Ticket No | | | | | | | | | | |

Question Paper Code: ACSC42

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal-500043, Hyderabad

B.Tech VI SEMESTER END EXAMINATIONS (REGULAR/SUPPLEMENTARY) - JUNE 2025
Regulation: UG-20
DEVOPS
(COMMON TO CSE | CSE(AI&ML) | CSE(DS) | CSE(CS) | CSIT | IT)

Time: 3 Hours **Max Marks: 70**

Answer ALL questions in Module I and II
Answer ONE out of two questions in Modules III, IV and V
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

MODULE – I

1. (a) Explain the process of branching and merging in Git. What are the best practices for managing branches and resolving conflicts? [BL: Understand| CO: 1|Marks: 7]

   (b) Your team is struggling with maintaining consistency in infrastructure configurations across multiple environments. How would you implement infrastructure as Code (IaC) to address this challenge? [BL: Apply| CO: 1|Marks: 7]

MODULE – II

2. (a) Discuss the key architectural differences between SVN and Git. How do these differences impact the way teams use these tools for version control and collaboration? [BL: Understand| CO: 2|Marks: 7]

   (b) A critical bug was introduced in the latest commit on the main branch. How would you use Git to identify the commit that introduced the bug and revert the changes? [BL: Apply| CO: 2|Marks: 7]

MODULE – III

3. (a) Discuss the key components and architecture of docker, including docker engine, docker hub, docker images, containers, networks, and volumes. [BL: Understand| CO: 3|Marks: 7]

   (b) Your team is migrating an existing monolithic application to microservices architecture using docker containers. Outline the steps and considerations for breaking down the monolith into smaller, independently deployable containers. [BL: Apply| CO: 3|Marks: 7]

4. (a) Describe the security considerations and best practices for docker containers and dockerized applications, covering topics such as container isolation, image security, network security, and vulnerability management. [BL: Understand| CO: 4|Marks: 7]

   (b) You need to ensure high availability and fault tolerance for a Docker Swarm cluster hosting critical applications. Outline the strategies and tools you would use to achieve these objectives. [BL: Understand| CO: 4|Marks: 7]

MODULE – IV

5. (a) Discuss the process of creating and managing Chef cookbooks. Include the steps involved in writing recipes, defining attributes, and testing cookbooks before deployment.
[BL: Understand| CO: 5|Marks: 7]

   (b) Explain the role of chef in cloud provisioning and configuration management. Discuss how Chef automates infrastructure deployment and ensures consistency across environments.
[BL: Understand| CO: 5|Marks: 7]

6. (a) Compare EC2 reserved instances, on-demand instances and spot instances in terms of pricing models, cost optimization strategies and use cases for each type.
[BL: Understand| CO: 5|Marks: 7]

   (b) List the advantages of deploying applications in docker containers. Discuss how docker simplifies application packaging, dependency management, and deployment across different environments.
[BL: Understand| CO: 5|Marks: 7]

MODULE – V

7. (a) Outline the process of creating a manual test plan for a complex web application. What key elements should be included, and how would you ensure the plan is thorough and effective?
[BL: Understand| CO: 6|Marks: 7]

   (b) How would you develop a comprehensive test plan to ensure full coverage of a new feature in your application, including edge cases and potential failure points? [BL: Apply| CO: 6|Marks: 7]

8. (a) Mention the key considerations when creating docker containers for automated testing. Discuss how you would handle dependencies and configuration. [BL: Understand| CO: 6|Marks: 7]

   (b) Describe how you would implement automated integration tests for a microservices architecture. What tools would you use, and how would you ensure data consistency across tests?
[BL: Understand| CO: 6|Marks: 7]

– ○ ○ ◯ ○ ○ –