Reg. No. :

Question Paper Code:U2301

B.E./B.Tech. DEGREE EXAMINATION, NOV 2025

Professional Elective

21CSV301 – CLOUD COMPUTING

Computer Science and Engineering

(Regulations 2021)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1.   Problem: CO2-App

Your cloud provider uses virtualization to allocate resources for applications.

Question:

How does virtualization enhance the efficiency of cloud infrastructure?

2.   Problem: CO2-App

Your cloud provider uses virtualization to allocate resources for applications.

Question:

How does virtualization enhance the efficiency of cloud infrastructure?

3.   Define a Virtual Machine.   CO1- U

4.   Compare full virtualization and para virtualization in terms of performance   CO1- U
     overhead and hardware dependency.

5.   Problem: CO2-App

You are setting up a virtualized environment for a new data center and need to
choose between a Type 1 (bare-metal) hypervisor and a Type 2 (hosted)
hypervisor.

Question:

What is the primary difference between Type 1 and Type 2 hypervisors, and
when would you prefer one over the other?

6. Problem: CO2-App

   You need to deploy a new application using a virtual machine (VM) and a Docker container.

   Question:

   What is the primary difference between a virtual machine and a Docker container in terms of resource usage and performance?

7. What is Google App Engine and what type of service model does it represent?   CO1- U

8. What are the key differences between Eucalyptus and OpenStack in terms of   CO1- U
   architecture and compatibility?

9. Problem: CO2-App

   You are setting up IAM roles for a team of developers in AWS. The developers need access to various AWS services, but you want to follow the principle of least privilege.

   Question:

   What is one best practice you should follow to ensure secure and efficient access management in AWS?

10. Problem: CO2-App

   You need to ensure that every user action in your AWS account is logged for security auditing purposes.

   Question:

   Which AWS service should you enable to capture and monitor all actions performed on your AWS resources

<div align="center">PART – B (5 x 16= 80 Marks)</div>

11. (a) Describe the service models in cloud computing: IaaS, PaaS, and   CO1- U   (16)
        SaaS.
<div align="center">Or</div>
    (b) Compare and contrast different system models used in distributed   CO1- U   (16)
        and cloud computing.

12. (a) Explain key concepts in virtualization such as isolation,   CO1- U   (16)
        encapsulation, and consolidation.
<div align="center">Or</div>
    (b) Describe the process and importance of memory virtualization.   CO1- U   (16)

<div align="center">2</div>

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13. (a) Virtualization vs. Containerization   CO2-App   (16)

Scenario:

Your company is considering using containers (like Docker) to run microservices instead of traditional virtual machines (VMs). They want to understand the key differences between these two approaches.

Problem:

What are the primary differences between virtualization using VMs and

containerization using Docker? When would you prefer one over the other?

Hint: Consider resource efficiency, isolation, overhead, and flexibility.

Or

(b) Docker and Virtualization in Multi-Cloud Environments   CO2-App   (16)

Scenario:

You have deployed a multi-cloud infrastructure where applications are running both in traditional virtualized environments (VMs) and in containerized environments using Docker.

Problem:

What challenges would you face when running Docker containers in a multi- cloud environment with existing virtualized infrastructure, and how would you ensure smooth integration between Docker and VMs?

Hint: Think about networking, storage compatibility, and orchestration platforms like Kubernetes.

14. (a) Describe the benefits and challenges of using a hybrid cloud   CO1- U   (16)
deployment model.

Or

(b) Discuss the impact of multi-cloud strategies on cloud deployment   CO1- U   (16)
environments.

15. (a) Discuss the key components of cloud security and their importance.   CO1- U   (16)

Or

(b) Explain the impact of multi-cloud strategies on cloud deployment   CO1- U   (16)
environments.

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