Reg. No. : | | | | | | | | | | | | |

Question Paper Code: U2301

B.E./B.Tech. DEGREE EXAMINATION, NOV 2024

Professional Elective

21CSV301 - CLOUD COMPUTING

(Régulations 2021)

(Common to CSE,EEE & IT Branches)

Duration: Three hours | Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1.	Explain the concept of serverless computing.	CO1 U
2.	Problem: You are considering different cloud deployment models for your organization's infrastructure. Question: What are the three main cloud deployment models, and briefly explain each?	CO2 App
3.	Name two benefits of virtualization.	CO1 U
4.	Explain the difference between Type 1 and Type 2 hypervisors.	CO1 U
5.	How does Docker differ from traditional virtualization?	CO1 U
6.	What are the key components of Docker architecture?	CO1 U
7.	Problem: You are tasked with provisioning resources in AWS for an application. The application requires a web server, database, and a storage solution. Question: Which AWS services would you use to provision these resources, and why?	CO1 U
8.	Problem: You are setting up a CI/CD pipeline in AWS for an application with frequent updates. The pipeline should automatically deploy new code after successful testing. Question: Which AWS services would you use to set up the CI/CD pipeline for automated deployment?	CO1 U
9.	What is the significance of regular security audits in cloud environments?	CO1 U

10. Problem: CO1 U

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?

PART – B (5 x 16= 80 Marks)

11. (a) Cost Management in Cloud Architecture CO2 - App (16)

Scenario:

Your company is running multiple cloud-based applications and wants to optimize costs without compromising performance. Currently, the company is over-provisioning resources.

Problem:

What are some strategies for cost optimization in a cloud architecture while maintaining performance and availability?

Hint: Consider strategies like right-sizing, reserved instances, auto-scaling, and leveraging cloud cost management tools.

Or

(b) Hybrid Cloud Integration Challenges CO2 - App (16)

Scenario:

Your organization has an existing on-premises data center and is planning to integrate it with a public cloud for burstable workloads during peak demand periods.

Problem:

What are the integration challenges when implementing a hybrid cloud architecture, and how would you address these challenges to ensure seamless data flow and secure communication between on-premises and cloud environments?

Hint: Consider factors like network latency, data consistency, security (VPN, Direct Connect), and hybrid cloud management tools.

12. (a) Explain the role of hypervisors in virtualization, including their types and functions. CO1 - U (16)

Or

(b) Describe the process and benefits of server consolidation using virtualization. CO1 - U (16)

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

Scenario:

Your company is considering using containers (like Docker) to run micro services 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 Networking and Virtualization CO2 - App (16)

Scenario:

You're setting up Docker containers to run a distributed application that needs communication between different containers and external systems, including legacy virtual machines.

Problem:

What networking options in Docker allow containers to communicate with each other and with external virtual machines, and how do these differ from networking in a traditional virtualized environment?

Hint: Explore bridge networks, host networks, and overlay networks in Docker, and compare them with virtual networks in hypervisors.

14. (a) Discuss the different cloud deployment models and their characteristics. CO1 - U (16)

Or

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

15. (a) Shared Responsibility Model in Cloud Security CO2 - App (16)

Scenario:

Your organization is moving workloads to a cloud service provider (CSP). You need to define the responsibilities for both your team and the CSP regarding security.

Problem:

What is the Shared Responsibility Model in cloud security, and how does it differ across IaaS, PaaS, and SaaS models? Provide examples of responsibilities for both the cloud provider and the customer for each model.

Hint: Consider areas like data security, infrastructure management, and access control.

Or

(b) Cloud Encryption Strategies CO2 - App (16)

Scenario:

Your organization stores sensitive customer data in the cloud, and you are concerned about the security of that data while at rest and during transmission.

Problem:

What are the key cloud encryption strategies for securing data both in transit and at rest? How do you ensure that data is encrypted end-to-end in the cloud?

Hint: Look into encryption keys management, encryption protocols (e.g., TLS), and encryption at the hypervisor level.