UNIT III: VIRTUALIZATION, PROGRAMMING MODELS & CLOUD APPLICATION DEVELOPMENT

Short Questions

S.No	Questions	BT	CO	PO
1	Define virtualization in the context of cloud environments.	L1	CO2	PO1
2	What is a Hypervisor (VMM) and what is its primary operational role?	L1	CO2	PO1
3	State the primary difference between Full Virtualization and Para-Virtualization.	L2	CO2	PO2
4	Define the MapReduce programming model.	L1	CO3	PO1
5	What are the specific responsibilities of 'Map' and 'Reduce' steps in a MapReduce framework?	L1	CO3	PO1
6	What is Cloud Haskell and what type of environment is it designed for?	L1	CO3	PO1
7	Mention two key advantages of using Cloud Haskell for distributed cloud execution.	L2	CO3	PO2
8	State two challenges encountered when developing software directly in the cloud.	L2	CO3	PO2
9	What is Operating System-Level Virtualization?	L1	CO2	PO1
10	What is meant by "Data Locality" in cloud-parallel programming models?	L1	CO3	PO1

Long Questions

S.No	Questions	BT	CO	PO
11	**a)** Explain the conceptual architecture of Virtualization. Discuss in detail how it facilitates resource pooling and multitenancy.	L2	CO2	PO1
	b) Elaborate on the structural differences between Hardware-Level Virtualization and Operating System-Level Virtualization.	L4	CO2	PO2
12	**a)** Write a detailed note on Type-1 (Bare-Metal) Hypervisors and Type-2 (Hosted) Hypervisors, contrasting their execution profiles.	L4	CO2	PO2
	b) Explain the core limitations, overhead challenges, and security concerns introduced by CPU and Memory virtualization.	L2	CO2	PO1
13	**a)** Describe the operational architecture of the MapReduce programming model. Illustrate the flow from data splits to final aggregate.	L2	CO3	PO1
	b) Analyze how a MapReduce framework handles automatic fault tolerance, node failure, and dynamic scaling across a network.	L4	CO3	PO3
14	**a)** Discuss Cloud Haskell as a programming model. Explain how it implements message-passing and actor concurrency controls over nodes.	L2	CO3	PO1
	b) Compare the functional paradigm of Cloud Haskell against standard procedural or object-oriented distributed development frameworks.	L4	CO3	PO2
15	**a)** Detail the complete end-to-end engineering lifecycle, frameworks, and tools involved in modern Software Development in the Cloud.	L2	CO3	PO1
	b) Explain the significance of Continuous Integration and Continuous Deployment (CI/CD) workflows within cloud-native application environments.	L3	CO3	PO3