SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

QUESTION BANK

M.E II SEMESTER

CP3262 – CLOUD COMPUTING TECHNOLOGIES

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

QUESTION BANK

SUBJECT : CP3262 –CLOUD COMPUTING TECHNOLOGIES

SEM / YEAR : M.E II / I

	UNIT I VIRTUALIZATION AND VIRTUALIZATION INFRASTRUCTURE
	Basics of Virtual Machines - Process Virtual Machines - System Virtual Machines - Emulation - Interpretation - Binary Translation - Taxonomy of Virtual Machines. Virtualization -Management Virtualization -- Hardware Maximization - Architectures - Virtualization Management - Storage Virtualization - Network Virtualization Implementation levels of virtualization - virtualization Structure -virtualization of CPU, Memory and I/O devices - virtual clusters and Resource Management, Virtualization for data center automation.

PART-A

Q.No	Questions	BT Level	Competence
1	What is a virtual machine? Name the two main types of virtual machines.	BTL -1	Remember
2	How does a virtual machine differ from a physical machine?	BTL -1	Remember
3	What is a process virtual machine? Give an example of a process virtual machine.	BTL -5	Evaluate
4	What is the primary use of a process virtual machine?	BTL -1	Remember
5	How does a system virtual machine differ from a process virtual machine?	BTL -1	Remember
6	What is the main advantage of a system virtual machine?	BTL -4	Analyze
7	What is the difference between interpretation and binary translation?	BTL -4	Analyze
8	What is emulation in virtualization?	BTL -1	Remember
9	What is the taxonomy of virtual machines? Name two classification criteria for virtual machines.	BTL -2	Understand
10	How is a hypervisor classified in virtualization taxonomy?	BTL -4	Analyze
11	What is the role of a hypervisor in virtualization?	BTL -3	Apply
12	What is hardware maximization in virtualization?	BTL -6	Create
13	How does virtualization help in hardware utilization?	BTL -3	Apply
14	Compare storage virtualization and network virtualization?	BTL -3	Apply
15	Formulate CCIF.	BTL -6	Create
16	What is the difference between full virtualization and paravirtualization?	BTL -2	Understand
17	What is OS-level virtualization?	BTL -2	Understand
18	Name one technique used for I/O virtualization.	BTL -5	Evaluate

19	What is the role of orchestration in virtualized data centres? Name one automation tool used in virtualized data centres.	BTL -1	Remember
20	Name one tool used for resource management in virtualized environments.	BTL -2	Understand
21	Discuss operating system level of virtualization.	BTL -3	Apply
22	Compare Hypervisor and Xen Server.	BTL -6	Create
23	Briefly explain hardware abstraction level of virtualization?	BTL -3	Apply
24	What is mean by I/O virtualization?	BTL -1	Remember
	PART-B		
1	Describe the following in detail i. Process Virtual Machines with examples. 8 ii. System Virtual Machines with examples. 8	BTL -1	Remember
2	Discuss the significance of virtualization in cloud computing. How does it improve resource utilization? 16	BTL -2	Understand
3	What are the different types of Virtualization? Explain each type with a real-world application. 16	BTL -3	Apply
4.	Explain the concepts of Emulation, Interpretation, and Binary Translation. Compare their advantages and disadvantages. 16	BTL -2	Understand
5	Describe Binary Translation in virtualization. How does it improve performance in virtual environments? 16	BTL -1	Understand
6	i. Explain the role of Virtual Machine Monitor (VMM) in CPU and Memory Virtualization. 8 ii. What are the key differences between Full Virtualization, Paravirtualization, and Hardware-Assisted Virtualization? Explain with examples. 8	BTL -1	Remember
7	i. Illustrate in detail about Virtualization Management 8 ii. Explain in detail the architecture of VMware and how it manages virtual machines efficiently. 8	BTL -3	Apply
8	i. Give the importance of Storage Virtualization? Explain its types and benefits in data centers. 8 ii. List the pros and cons of Storage Virtualization. 8	BTL -2	Understand
9	Write short notes on: i. Features in CPU Virtualization 8 ii. What are Virtual Clusters? Explain their architecture and role in resource management. 8	BTL -6	Create
10	Compare Virtualization-based Data Centers with Traditional Data Centers. 16	BTL -4	Analyze
11	Explain the following challenges in cloud i. Virtual Clusters and Physical Clusters in Resource Management 8 ii CPU Virtualization 8	BTL -5	Evaluate
12	Analyze the role of virtualization in automating modern data centers. How does it enhance efficiency, scalability, and resource management? 16	BTL -4	Analyze

13	Discuss Virtual Machine Migration. Explain different types of VM migration techniques and their advantages.	16	BTL -1	Remember
14	Describe how virtualization improves security, scalability, and cost-efficiency in modern cloud environments.	16	BTL -4	Analyze
15	**Explain** the differences between hypervisor and para-virtualization and give one example VMM (virtual machine monitor), that was built in each of the two categories.	16	BTL -4	Analyze
16	**Summarize** the enabling technologies for building the cloud platforms from virtualized and automated data centers to provide services. Identify hardware, software, and networking mechanisms or business models that enable multitenant services	16	BTL -5	Evaluate
17	Explain the about Virtualization for Linux and Windows and NT Platform. **Design** the process of Live Migration of VM from one host to another.	16	BTL -4	Analyze
	UNIT II CLOUD PLATFORM ARCHITECTURE			
	Cloud Computing: Definition, Characteristics - Cloud deployment models: public, private, hybrid, community - Categories of cloud computing: Everything as a service: Infrastructure, platform, software - Layered cloud Architectural Development - Architectural Design Challenges			
	PART-A			
1	**State** the types of clouds with proper examples?		BTL -1	Remember
2	**Define** short notes on Community cloud		BTL -1	Remember
3	Differentiate Public cloud and Private cloud.		BTL -4	Analyze
4	**List** out the characteristics of SaaS.		BTL -1	Remember
5	**Tabulate examples** provided by platform as a service.		BTL -1	Remember
6	**Why** does one choose public cloud over private cloud? **Analyze.**		BTL -4	Analyze
7	**Point ou**t the role of cloud auditor in cloud.		BTL -4	Analyze
8	**Define** the advantages of using the cloud carrier		BTL -1	Remember
9	**Differentiate** cloud consumer and provider		BTL -2	Understand
10	**Compare** service aggregation and service arbitrage		BTL -5	Evaluate
11	**Show** the interaction between the Actors in the cloud computing		BTL -3	Apply
12	**Draw** the diagram for conceptual reference model for cloud		BTL -6	Create
13	**Demonstrate** the cloud service Orchestration		BTL -3	Apply
14	**Illustrate** the major activities of cloud provider		BTL -3	Apply
15	**Identify** the need Hybrid cloud.		BTL -6	Create
16	**Express** the characteristics of private cloud		BTL -2	Understand
17	**Discuss** any three features of IaaS		BTL -2	Understand
18	**Summarize** the benefits and drawbacks of using “Platform as a Service”		BTL -5	Evaluate
19	**Define** cloud broker		BTL -1	Remember
20	**Discuss** the benefits and drawbacks of using “Infrastructure as a Service”		BTL -2	Understand
21	**What are the uses of** Community cloud?		BTL -2	Understand

22	Give the the Iaas providers.		BTL -2	Understand
23	**List** out the SaaS.providers		BTL -1	Remember
24	List out the paas providers.		BTL -1	Remember
	PART-B			
1	**Describe the** NIST cloud computing reference architecture.	16	BTL -1	Remember
2	**Explain** the various design challenges for effective cloud computing environment.	16	BTL -5	Evaluate
3	**Illustrate** in detail about The Conceptual Reference Model of cloud	16	BTL -3	Apply
4	List and **discuss** the principles for designing Public cloud, private cloud and Hybrid cloud.	16	BTL -2	Understand
5	**Describe** Cloud deployment models with neat diagrams.	16	BTL -1	Remember
6	Briefly **discuss** the architectural design challenges of the cloud	16	BTL -2	Understand
7	**i. Discuss** the features of Infrastructure as a service. ii. Describe in detail about IaaS with example	8 8	BTL -2	Understand
8	i. **Point out** the features of Platform as a Service ii. Discuss in detail about Paas with example.	8 8	BTL -4	Analyze
9	**Describe** in detail about the cloud Storage in detail with example.	16	BTL -1	Remember
10	**i. Explain** the features of software as a Service. ii. Discuss in detail about Saas with example	8 8	BTL -4	Analyze
11	**Compare:** Public. Private and Hybrid clouds.	16	BTL -4	Analyze
12	i. **List** out the Cloud Storage Providers and explain. ii. Explain in detail about Amazon Simple Storage Service (S3).	8 8	BTL -1	Remember
13	**Demonstrate** thee architectural design of compute and storage clouds.	16	BTL -3	Apply
14	**Generalize** the following in detail i. Google Bigtable Datastore ii. Mobile Me.	 8 8	BTL -6	Create
15	Briefly explain each of the cloud computing services. **Identify** two cloud providers by company name in each service category.	16	BTL -1	Remember
16	It is said, 'cloud computing can save money'. What is your view? Can you name some open source cloud computing platform databases? **Explain** any one database in detail.	16	BTL -2	Understand
17	What are the advantages of Cloud Computing over the Internet? **Explain?** Give the architecture of P2P systems. What are the major categories of P2P Network families?	16	BTL -5	Evaluate
	UNIT III EDGE AND FOG COMPUTING			
	Fog Computing, Characteristics, Application Scenarios, Issues and challenges-Fog Computing Architecture: Communication and Network Model, Programming Models, Fog Architecture for smart cities, healthcare and vehicles. Edge Computing Scenario's and Use cases - Edge computing purpose and definition, Edge computing use cases, Edge computing hardware architectures, Edge platforms, Edge vs Fog Computing.			

PART-A				
1	Define fog computing. Mention two characteristics of fog computing.		BTL -1	Remember
2	List any two application scenarios of fog computing.		BTL -1	Remember
3	Mention two communication models in fog computing architecture.		BTL -2	Understand
4	What is the difference between fog computing and cloud computing?		BTL -1	Remember
5	Define edge computing.		BTL -1	Remember
6	Point out two purposes of edge computing.		BTL -4	Analyze
7	How does a programming model in fog computing affect application development?		BTL -2	Understand
8	Name two network models used in fog computing. List two programming models used in fog computing.		BTL -1	Remember
9	How does fog computing enhance network security?		BTL -4	Analyze
10	Mention two types of network connectivity in fog computing.		BTL -4	Analyze
11	What is the role of an edge device?		BTL -3	Apply
12	Why is edge computing important for real-time applications?		BTL -6	Create
13	Define edge computing.		BTL -3	Apply
14	What is the main purpose of edge computing?		BTL -3	Apply
15	Name two healthcare devices that can use fog computing.		BTL -6	Create
16	How does fog computing help in managing electronic health records (EHR)?		BTL -2	Understand
17	What are two ways fog computing supports smart traffic management?		BTL -5	Evaluate
18	How does fog computing enhance road safety?		BTL -5	Evaluate
19	How does fog computing improve data security in healthcare?		BTL -1	Remember
20	Mention two challenges of using fog computing in healthcare.		BTL -2	Understand
21	Differences between Cloud and Fog Computing		BTL -2	Understand
22	What are the benefits of Fog Computing:		BTL -1	Remember
23	Give the role of Fog devices		BTL -4	Analyze
24	What are the Fog Deployment Models		BTL -2	Understand
PART-B				
1	Describe Fog Computing, Characteristics, Issues and challenges- Fog Computing Architecture.	16	BTL -1	Remember
2	Discuss Fog computing,Characteristics, Application Scenarios	16	BTL -2	Understand
3	Illustrate the following in detail i. Discuss the different types of network architectures used in fog computing. ii. Explain various programming models used in fog computing with suitable examples. iii.Discuss the role of virtualization and containerization in fog computing.	 5 5 6	BTL -3	Apply

4	i.Compare traditional programming models with fog computing programming models. ii. Discuss the challenges in developing software applications for fog computing environments.	8 8	BTL -4	Analyze
5	Summarize the following edge computing i. Fog Architecture for smart cities, ii. Healthcare iii. Vehicles.	 5 5 6	BTL -5	Evaluate
6	How does fog computing enhance data security and privacy in healthcare systems?	16	BTL -1	Remember
7	Explain the impact of fog computing on telemedicine and remote healthcare solutions.	16	BTL -2	Understand
8	i.Define Edge computing hardware architectures. ii Illustrate the Edge computing purpose and definition.	6 10	BTL -3	Apply
9	Discuss the challenges in implementing fog computing in the healthcare sector.	16	BTL -4	Analyze
10	Compare cloud computing and fog computing in the context of healthcare data processing.	16	BTL -1	Remember
11	Discuss the security concerns of using fog computing in vehicular networks and how to overcome them.	16	BTL -6	Create
12	Discuss the role of fog computing in real-time navigation and traffic management.	16	BTL -2	Understand
13	How does fog computing contribute to predictive maintenance in modern vehicles?	16	BTL -4	Analyze
14	Describe the following in detail i.Edge computing hardware architectures, ii.Edge platforms, iii.Edge vs Fog Computing	 5 5 6	BTL -1	Remember
15	Explain the myth associated with Fog Computing	16	BTL -2	Understand
16	Explain the security and pri vac y issues and solutions of fog computing	16	BTL -3	Apply
17	Name any 5 edge cloud computing services and explain	16	BTL -4	Analyze
	UNIT IV CLOUD PLATFORMS			
	Amazon Web Services: AWS Infrastructure- AWS API- AWS Management Console - Setting up AWS Storage - Stretching out with Elastic Compute Cloud - Elastic Container Service for Kubernetes- .WindowsAzure: Origin of Windows Azure, Features, The Fabric Controller - First Cloud APP in Windows Azure- Service Model and Managing Services: Definition and Configuration, Service runtime API.			
	PART-A			
1	Outline the main services that are offered by AWS.		BTL -1	Remember
2	What is the use of cloud Watch in Amazon EC2?		BTL -1	Remember
3	What is AWS Glacier used for?		BTL -2	Understand

4	How does AWS storage improve scalability?	BTL -1	Remember
5	Enumerate the features of Eucalyptus cloud	BTL -1	Remember
6	Analyze Amazon Simple Storage Service (S3).	BTL -4	Analyze
7	Point out the use Amazon elastic block store.	BTL -2	Understand
8	Define SQS and SNS services of AWS cloud	BTL -1	Remember
9	Differentiate Amazon SimpleDB and AmazonRDS.	BTL -4	Analyze
10	Analyze the open stack components	BTL -4	Analyze
11	State and discover the core components of AppEngine.	BTL -3	Apply
12	Identify the development technologies currently supported by AppEngine.	BTL -6	Create
13	Demonstrate the AWS Architecture.	BTL -3	Apply
14	What are the key features of Microsoft Azure?	BTL -3	Apply
15	Create a DataStore. What type of data can be stored in it?	BTL -6	Create
16	What is the purpose of AWS SDKs?	BTL -2	Understand
17	How does AWS API support automation in cloud computing?	BTL -5	Evaluate
18	What was the first cloud application developed on Windows Azure?	BTL -5	Evaluate
19	Name two key functions of the Azure Service Runtime API.	BTL -1	Remember
20	What is the role of Azure SDK in managing cloud services?	BTL -2	Understand
21	**Give the benefits of** Amazon Simple Storage Service (S3).	BTL -2	Understand
22	**Show** Amazon EC2 and its basic features.	BTL -1	Remember
23	What is a bucket in S3? What type of storage does it provide?	BTL -4	Analyze
24	List the AWS offering services	BTL -1	Remember
	PART-B		
1	Explain the architecture of AWS infrastructure with a focus on regions, availability zones, and edge locations. How does this architecture ensure high availability and fault tolerance? 16	BTL -2	Understand
2	Discuss the security mechanisms provided by AWS for its infrastructure. 8 How does AWS ensure compliance with industry security standards? 8	BTL -1	Remember
3	Compare Amazon S3, Amazon EBS, and Amazon Glacier in terms of performance, use cases, and pricing models. 16	BTL -2	Understand
4	Illustrate any five web services of Amazon in detail 16	BTL -3	Apply
5	i. List the AWS offering 6 ii. Explain in detail about Amazon web services 10	BTL -4	Analyze
6	Explain how AWS Storage Gateway enables hybrid cloud storage. What are the different types of gateways available?neat diagram. 16	BTL -5	Evaluate
7	Explain the role of AWS API in automating cloud operations. How does AWS API Gateway help in managing RESTful and WebSocket APIs? 16	BTL -4	Analyze
8	i. What is the Service Runtime API in Azure? 6 ii.Compare and contrast AWS API and AWS SDK. Discuss their use cases with suitable examples. 10	BTL -1	Remember

9	Explain the architecture of AWS Elastic Kubernetes Service (EKS). How does it integrate with other AWS services like IAM, VPC, and CloudWatch?	16	BTL -4	Analyze
10	Discuss the advantages and challenges of using AWS EKS over a self-managed Kubernetes cluster.	16	BTL -1	Remember
11	Discuss the following in detail i.Compare the three main cloud service models (IaaS, PaaS, and SaaS) in Azure with examples ii.How do they cater to different business needs?	8 8	BTL -2	Understand
12	Discuss the functionalities of the Azure Service Runtime API. How does it help in managing cloud applications efficiently?	16	BTL -6	Create
13	Discuss the functionalities of the Azure Service Runtime API. How does it help in managing cloud applications efficiently?	16	BTL -1	Remember
14	Explain the process of deploying a cloud application in Microsoft Azure. How does Azure App Services simplify application management?	16	BTL -3	Apply
15	What are the tools and techniques that you can use in AWS to identify if you are paying more than you should be, and how to correct it?		BTL -4	Analyze
16	What is a DDoS attack, and what AWS services can minimize them?		BTL -1	Remember
17	**Find** the different file systems used in cloud environment-Explain in detail about the file systems used GFS and Amazon S3.		BTL -2	Understand
	UNIT V PROGRAMMING MODEL			
	Introduction to Hadoop Framework - Map Reduce, Input splitting, map and reduce functions, specifying input and output parameters, configuring and running a job -Developing Map Reduce Applications - Design of Hadoop file system -Setting up Hadoop Cluster- Aneka: Cloud Application Platform, Thread Programming, Task Programming and Map-Reduce Programming in Aneka .			
	PART-A			
1	What is Hadoop?		BTL -1	Remember
2	Name the core components of the Hadoop ecosystem.		BTL -1	Remember
3	What are the advantages of using Hadoop for big data processing?		BTL -2	Understand
4	How does Hadoop achieve fault tolerance?		BTL -1	Remember
5	What is MapReduce in Hadoop?		BTL -1	Remember
6	Name the two main functions in the MapReduce model.		BTL -4	Analyze
7	How does the Map function in MapReduce work?		BTL -2	Understand
8	What is the role of the Reduce function in MapReduce?		BTL -1	Remember
9	What is input splitting in MapReduce?		BTL -4	Analyze
10	How does Hadoop decide the size of an input split?		BTL -4	Analyze
11	What is the default size of an HDFS block?		BTL -3	Apply
12	How does input splitting improve Hadoop performance?		BTL -6	Create
13	What file formats are commonly used for input in Hadoop MapReduce?		BTL -3	Apply
14	How can we specify input and output formats in a MapReduce job?		BTL -3	Apply

15	What is the function of the InputFormat class in Hadoop?		BTL -6	Create
16	What is the function of the OutputFormat class in Hadoop?		BTL -2	Understand
17	What is Aneka in cloud computing?		BTL -5	Evaluate
18	What are the main components of the Aneka framework?		BTL -5	Evaluate
19	How does Aneka support multi-cloud environments?		BTL -1	Remember
20	What are the key advantages of using MapReduce in Aneka? How does Aneka distribute MapReduce tasks across multiple nodes?		BTL -2	Understand
21	What are the advantages of using MapReduce with Hadoop?		BTL -1	Remember
22	What do you mean by shuffling and sorting in MapReduce?		BTL -4	Analyze
23	What is a combiner and where you should use it?		BTL -2	Understand
24	What are the Problems with Traditional Approach?		BTL -1	Remember
	PART-B			
1	Explain the architecture of the Hadoop framework. How do its components (HDFS, YARN, and MapReduce) work together to process big data?	16	BTL -2	Understand
2	i. Compare Hadoop with traditional database systems. What advantages does Hadoop offer for handling large-scale data processing? ii.Discuss the advantages and limitations of the MapReduce programming model. How does it compare with other big data processing frameworks like Apache Spark?	8 8	BTL -1	Remember
3	i)What is Hadoop? Name the core components of the Hadoop ecosystem. ii) What are the advantages of using Hadoop for big data processing?	8 8	BTL -2	Understand
4	Discuss how Hadoop handles structured and unstructured data in MapReduce processing. Provide examples of suitable input and output formats.	16	BTL -3	Apply
5	i. Explain the concept of input splitting in Hadoop MapReduce. ii.Compare input splitting in Hadoop with traditional file processing methods. How does it optimize distributed processing?	8 8	BTL -4	Analyze
6	Explain how AWS Storage Gateway enables hybrid cloud storage. What are the different types of gateways available? neat diagram.	16	BTL -5	Evaluate
7	Explain the design and architecture of HDFS. How does it handle data replication, fault tolerance, and scalability?	16	BTL -4	Analyze
8	i.Developing Map Reduce Application. ii.Compare HDFS with traditional file systems. How does HDFS enable efficient storage and retrieval of big data?	6 10	BTL -1	Remember
9	Describe the steps involved in configuring and running a Hadoop MapReduce job. What key parameters must be set for an efficient job execution?	16	BTL -4	Analyze

10	Explain how Hadoop YARN (Yet Another Resource Negotiator) manages resources for running MapReduce jobs.	16	BTL -1	Remember
11	Discuss the following in detail i. Compare Aneka with other cloud computing platforms like AWS and Microsoft Azure. How does it support distributed computing? ii. Explain the concept of thread programming in Aneka. How does it support parallelism in cloud computing?	8 8	BTL -2	Understand
12	Explain the implementation of MapReduce programming in Aneka. How does it support parallel processing in cloud environments?	16	BTL -6	Create
13	Compare and contrast MapReduce programming in Aneka with Hadoop's MapReduce framework. What are the key differences and advantages?	16	BTL -1	Remember
14	Explain the concept of thread programming in Aneka. How does it support parallelism in cloud computing?	16	BTL -3	Apply
15	**Find** out which one of the following cloud solution best suits for research purpose i. Eucalyptus ii. Open Nebula iii. Aneka Justify your Answer.		BTL -6	Create
16	**Explain** in detail about how to set up a private cloud for an academic university using any one of the cloud environments		BTL-5	Evaluate
17	**Summarize** the various emerging cloud software environment and explain briefly about anyone of the environment		BTL-5	Evaluate