SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & DATA SCIENCE

QUESTION BANK

V SEMESTER

IT3761 – CLOUD COMPUTING

Regulation – 2023

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QUESTION BANK

SUBJECT   : IT3761 & CLOUD COMPUTING

YEAR/SEM   : III Year / V Semester

UNIT- I: VIRTUALIZATION AND VIRTUALIZATION INFRASTRUCTURE

Building cloud computing environments - Basics of Virtual Machines - Characteristics of virtualized environments – Taxonomy of virtualization techniques – Virtualization and cloud computing – Pros and cons of virtualization – Technology examples

PART – A

Q.No	Questions	BT Level	Competence
1	What is cloud computing?	BTL1	Remember
2	Define virtualization in the context of cloud computing.	BTL1	Remember
3	List two key components of a cloud computing environment.	BTL1	Remember
4	What is a virtual machine (VM)?	BTL1	Remember
5	Mention any two characteristics of virtualized environments.	BTL2	Understand
6	What is hypervisor in virtualization?	BTL2	Understand
7	State two advantages of using virtual machines over physical machines.	BTL2	Understand
8	What do you mean by full virtualization?	BTL2	Understand
9	List any two types of virtualization techniques.	BTL1	Remember
10	Differentiate between Type 1 and Type 2 hypervisors.	BTL2	Understand
11	Name two technologies used to implement virtualization.	BTL1	Remember
12	What are the key benefits of virtualization in cloud computing?	BTL2	Understand
13	Mention any two limitations of virtualization.	BTL2	Understand
14	Define paravirtualization.	BTL2	Understand
15	How does virtualization enable resource isolation?	BTL2	Understand
16	What is meant by the term "Virtualization Taxonomy"?	BTL2	Understand
17	List two examples of virtualization platforms.	BTL1	Remember
18	Give two differences between virtualized and non-virtualized environments.	BTL2	Understand
19	State two use cases where virtualization is highly beneficial.	BTL2	Understand
20	What is the relationship between cloud computing and virtualization?	BTL2	Understand
21	What is hardware-level virtualization?	BTL1	Remember
22	How does virtualization improve disaster recovery in cloud computing?	BTL2	Understand
23	What is the role of a virtual machine monitor (VMM)?	BTL2	Understand
24	List two differences between containers and virtual machines.	BTL2	Understand

PART-B

1	Explain in detail the architecture of a cloud computing environment. How are resources managed and provisioned in such environments?	BTL3	Apply

2	Describe the concept and working of virtual machines. How do they contribute to the creation of scalable cloud platforms?	BTL3	Apply
3	Discuss the characteristics of virtualized environments. How do they differ from traditional computing environments?	BTL4	Analyze
4	Elaborate on the taxonomy of virtualization techniques. Compare and contrast at least four types with suitable examples.	BTL5	Evaluate
5	Analyze the role of virtualization in cloud computing. Why is virtualization considered a foundational technology for cloud platforms?	BTL5	Evaluate
6	Critically examine the advantages and disadvantages of virtualization in enterprise cloud adoption.	BTL5	Evaluate
7	With the help of diagrams, explain the working of Type 1 and Type 2 hypervisors. State use cases for each	BTL4	Analyze
8	How does virtualization facilitate resource abstraction and isolation? Explain with real-world scenarios.	BTL4	Analyze
9	Compare full virtualization, para-virtualization, and hardware-assisted virtualization. Highlight their operational differences.	BTL5	Evaluate
10	Discuss the role of hypervisors in managing virtual machines. How does a hypervisor ensure performance and security?	BTL3	Apply
11	Explain the process of building cloud computing environments using virtual infrastructure. Include tools and best practices.	BTL6	Create
12	What are the technological challenges in managing virtualized cloud data centers? Propose solutions for each.	BTL5	Evaluate
13	Discuss how virtualization improves fault tolerance and disaster recovery in cloud infrastructure.	BTL4	Analyze
14	Write a detailed note on containerization versus virtualization. When should each be preferred	BTL5	Evaluate
15	Explain the concept of live migration of virtual machines. How is it implemented and what are its benefits?	BTL3	Apply
16	Design a virtualized cloud infrastructure for a small enterprise that requires high availability, scalability, and disaster recovery. Describe the components, technologies used, and justify your choices.	BTL6	Create
17	Create a comparative study report that proposes a virtualization strategy for migrating a traditional data center to a cloud-based environment. Include aspects like cost, performance, security, and management.	BTL6	Create

UNIT II - CLOUD PLATFORM ARCHITECTURE			
Cloud Computing: Definition, Characteristics - The cloud reference model - Cloud deployment models: public, private, hybrid, community – Economics of the cloud – Open challenges.			
PART – A			
Q.No	Questions	BT Level	Competence
1	Define cloud computing.	BTL1	Remember
2	What is meant by cloud service?	BTL1	Remember
3	List two characteristics of cloud computing.	BTL1	Remember

4	What is a public cloud?	BTL1	Remember
5	Define private cloud with an example.	BTL1	Remember
6	What is a hybrid cloud?	BTL1	Remember
7	What is a community cloud?	BTL1	Remember
8	State two advantages of using a public cloud.	BTL1	Remember
9	List any two components of the cloud reference model.	BTL1	Remember
10	Define cloud deployment model.	BTL1	Remember
11	What do you mean by elasticity in cloud computing?	BTL1	Remember
12	Mention two economic benefits of using cloud computing.	BTL1	Remember
13	Differentiate between private and public clouds.	BTL2	Understand
14	What is meant by the term "cloud scalability"?	BTL2	Understand
15	What is the significance of virtualization in cloud computing?	BTL2	Understand
16	Why is multi-tenancy important in cloud?	BTL2	Understand
17	What is the 'pay-as-you-go' pricing model in cloud computing?	BTL2	Understand
18	How does the cloud model support rapid elasticity?	BTL2	Understand
19	How does resource pooling work in cloud environments?	BTL2	Understand
20	What are the key features of the cloud reference model?	BTL2	Understand
21	What is one data privacy challenge faced in cloud computing?	BTL2	Understand
22	How do cloud services reduce capital expenditure for businesses?	BTL2	Understand
23	Define on-demand self-service and its role in cloud computing.	BTL2	Understand
24	Why is cloud interoperability considered a challenge?	BTL2	Understand
PART-B			
1	Apply the cloud reference model to describe a real-world cloud application architecture.	BTL3	Apply
2	Using an example, apply the characteristics of cloud computing to a startup business scenario.	BTL3	Apply
3	Illustrate the cloud deployment models using real-life use cases.	BTL3	Apply
4	Apply the concept of cloud economics to justify the adoption of cloud in an educational institution.	BTL3	Apply
5	Analyze the differences among public, private, hybrid, and community clouds with suitable examples.	BTL4	Analyze
6	Analyze how the cloud reference model supports service delivery in cloud computing.	BTL4	Analyze
7	Compare and analyze the economic advantages and limitations of cloud adoption for SMEs.	BTL4	Analyze
8	Analyze the open challenges in cloud computing with respect to security and data governance.	BTL4	Analyze
9	Examine the role of virtualization in achieving cloud characteristics.	BTL4	Analyze
10	Critically evaluate the cloud deployment models and determine the best fit for a healthcare organization.	BTL5	Evaluate
11	Evaluate the effectiveness of the "pay-as-you-go" economic model in long-term business strategy.	BTL5	Evaluate
12	Assess the advantages and disadvantages of public vs private clouds in terms of security and cost.	BTL5	Evaluate
13	Evaluate the cloud reference model and its adequacy in handling multi-tenant environments.	BTL5	Evaluate

14	Design a cloud infrastructure model for a mid-sized e-commerce company considering cost and scalability.	BTL5	Evaluate
15	Create a deployment strategy using hybrid cloud for a government agency ensuring compliance and availability. (Create)	BTL5	Evaluate
16	Propose a solution to address the interoperability challenge in multi-cloud environments.	BTL5	Evaluate
17	Develop a framework to assess economic feasibility of cloud adoption for educational institutions.	BTL5	Evaluate

UNIT III   PROGRAMMING MODEL
Aneka: Building Aneka clouds, Cloud programming and management, Multithreading with Aneka - Multithreading with Aneka - Programming applications with Aneka threads - Aneka task based programming - Aneka MapReduce programming

PART – A				
Q.No	**Questions**	**BT Level**	**Competence**
1	What is Aneka?	BTL1	Remember
2	Define Aneka container.	BTL1	Remember
3	List any two programming models supported by Aneka.	BTL1	Remember
4	What is Aneka task programming?	BTL1	Remember
5	Define thread programming in Aneka.	BTL1	Remember
6	What is MapReduce programming in Aneka?	BTL1	Remember
7	Mention two services provided by Aneka.	BTL1	Remember
8	What is the role of the Aneka Master Container?	BTL1	Remember
9	Define multithreading.	BTL1	Remember
10	What is the Scheduler in Aneka?	BTL1	Remember
11	List two features of Aneka cloud.	BTL1	Remember
12	What do you mean by task in task-based programming?	BTL1	Remember
13	How does multithreading contribute to Aneka's functionality?	BTL2	Understand
14	In what ways does Aneka assist developers in building cloud applications?	BTL2	Understand
15	Differentiate between task programming and thread programming in Aneka.	BTL2	Understand
16	What is the use of the Aneka Management Studio?	BTL2	Understand
17	How does Aneka facilitate resource provisioning?	BTL2	Understand
18	What are the key components of Aneka's cloud architecture?	BTL2	Understand
19	How does Aneka manage and execute task scheduling in cloud applications?	BTL2	Understand
20	What are the advantages of using Aneka for programming distributed applications?	BTL2	Understand
21	Why is extensibility important in the Aneka platform?	BTL2	Understand
22	How do Aneka containers support cloud infrastructure management?	BTL2	Understand
23	What is the role of Aneka in managing multi-threaded applications?	BTL2	Understand
24	How does Aneka implement MapReduce?	BTL2	Understand
PART-B				
1	Apply Aneka's task programming model to build a basic distributed image	BTL3	Apply

	processing application.		
2	Demonstrate the process of building an Aneka-based cloud using available infrastructure.	BTL3	Apply
3	Illustrate how Aneka handles multithreading through its programming API.	BTL3	Apply
4	Show how to manage and monitor cloud applications using Aneka Management Studio.	BTL3	Apply
5	Analyze the differences between Aneka's thread and task programming models with examples.	BTL4	Analyze
6	Compare Aneka's programming models in terms of scalability and use cases.	BTL4	Analyze
7	Analyze the MapReduce model in Aneka and compare it with traditional MapReduce frameworks like Hadoop.	BTL4	Analyze
8	Examine the internal architecture of Aneka containers and their roles.	BTL4	Analyze
9	Analyze how Aneka supports dynamic provisioning and scheduling of tasks.	BTL4	Analyze
10	Evaluate the efficiency of task-based programming in Aneka for parallel computing workloads.	BTL5	Evaluate
11	Critically evaluate the use of Aneka for educational cloud environments.	BTL5	Evaluate
12	Assess the strengths and limitations of Aneka in real-time data processing.	BTL5	Evaluate
13	Evaluate the suitability of Aneka MapReduce for big data applications.	BTL5	Evaluate
14	Design a multi-threaded application using Aneka for scientific computation.	BTL6	Create
15	Create a use-case-driven workflow to deploy a hybrid Aneka cloud for a university.	BTL6	Create
16	Propose enhancements to the Aneka cloud platform to support containerized applications (e.g., using Docker).	BTL6	Create
17	Develop a real-time IoT data analytics solution using Aneka's task programming model.	BTL6	Create

UNIT IV- CLOUD PLATFORMS
Amazon Web Services: AWS Platform – Services: Compute, Storage, Communication & Additional Services - Google App Engine: Application, Architecture and Cost Model -. Windows Azure: Origin of Windows Azure, Features - SQL Azure - Windows Azure platform appliance

PART – A			
Q.No	Questions	BT Level	Competence
1	What is Amazon Web Services (AWS)?	BTL1	Remember
2	Define EC2 in AWS.	BTL1	Remember
3	What is S3 in AWS?	BTL1	Remember
4	Mention two compute services provided by AWS.	BTL1	Remember
5	List any two AWS storage services.	BTL1	Remember
6	What is the function of AWS Lambda?	BTL1	Remember
7	Define Google App Engine.	BTL1	Remember
8	What is the architecture style used in GAE?	BTL1	Remember
9	List any two features of Windows Azure.	BTL1	Remember
10	Define SQL Azure.	BTL1	Remember
11	What is Windows Azure Platform Appliance?	BTL1	Remember

12	Name any two communication services in AWS.	BTL1	Remember
13	What is the pricing structure of Google App Engine?	BTL2	Understand
14	Differentiate between EC2 and S3 services in AWS.	BTL2	Understand
15	What is the function of Elastic Load Balancing in AWS?	BTL2	Understand
16	In what ways does GAE support the scaling of applications?	BTL2	Understand
17	What are the core components of Windows Azure architecture?	BTL2	Understand
18	How does SQL Azure differ from traditional SQL databases?	BTL2	Understand
19	What is the significance of the Windows Azure Platform Appliance?	BTL2	Understand
20	What are the functions of communication services offered by AWS?	BTL2	Understand
21	How does AWS ensure fault tolerance in its services?	BTL2	Understand
22	What are the advantages of deploying applications in GAE?	BTL2	Understand
23	How are additional AWS services such as CloudWatch and IAM used?	BTL2	Understand
24	How does Microsoft Azure provide Platform as a Service (PaaS)?	BTL2	Understand
PART-B			
1	Apply AWS compute and storage services to design a web application deployment plan.	BTL3	Apply
2	Show how to deploy and monitor a simple app using Google App Engine.	BTL3	Apply
3	Demonstrate how to create a relational database solution using SQL Azure.	BTL3	Apply
4	Illustrate the integration of AWS communication services in a cloud-based messaging system.	BTL3	Apply
5	Analyze the cost and performance trade-offs between AWS and GAE for startup deployment.	BTL4	Analyze
6	Compare and contrast compute services of AWS, Azure, and GAE.	BTL4	Analyze
7	Analyze how Azure provides high availability and disaster recovery for enterprise applications.	BTL4	Analyze
8	Examine the internal architecture and operations of Windows Azure Platform Appliance.	BTL4	Analyze
9	Analyze how SQL Azure supports cloud-based data warehousing.	BTL4	Analyze
10	Evaluate the advantages and limitations of using AWS for enterprise cloud transformation.	BTL5	Evaluate
11	Critically evaluate GAE's architecture in terms of scalability and cost.	BTL5	Evaluate
12	Assess the suitability of Windows Azure for hosting government applications.	BTL5	Evaluate
13	Evaluate the effectiveness of SQL Azure for real-time data analytics.	BTL5	Evaluate
14	Design a cloud infrastructure using AWS services to support an online education platform.	BTL6	Create
15	Create a comparison framework to select between AWS, Azure, and GAE for an enterprise cloud migration.	BTL6	Create
16	Propose a hybrid cloud solution integrating Azure and AWS for disaster recovery and backup.	BTL6	Create
17	Develop a cost-optimized multi-tier application using Google App Engine's components.	BTL6	Create

UNIT V - CLOUD APPLICATIONS
Scientific applications - Business and consumer application – Market-based management of clouds -

	Federated clouds / Inter Cloud – Third-party cloud services.		
	PART – A		
Q.No	**Questions**	**BT Level**	**Competence**
1	What is a scientific application in the context of cloud computing?	BTL1	Remember
2	Mention two business applications commonly deployed on the cloud.	BTL1	Remember
3	Define consumer cloud applications with examples.	BTL1	Remember
4	What is meant by federated cloud?	BTL1	Remember
5	Define Intercloud.	BTL1	Remember
6	What are third-party cloud services?	BTL1	Remember
7	Name two examples of third-party cloud service providers.	BTL1	Remember
8	Define market-based cloud management.	BTL1	Remember
9	What is a resource broker in federated cloud systems?	BTL1	Remember
10	Name two scientific domains that use cloud infrastructure.	BTL1	Remember
11	What is the role of SLA in cloud service delivery?	BTL1	Remember
12	Define data locality in cloud-based scientific applications.	BTL1	Remember
13	What are the difficulties involved in deploying scientific applications on the cloud?	BTL2	Understand
14	How does the cloud benefit business applications?	BTL2	Understand
15	How do consumer applications utilize cloud storage services?	BTL2	Understand
16	How does market-based management improve cloud resource allocation?	BTL2	Understand
17	What is the function of a cloud federation manager?	BTL2	Understand
18	Differentiate between Intercloud and Federated Cloud.	BTL2	Understand
19	What is the operational workflow of a federated cloud system?	BTL2	Understand
20	How do third-party services simplify cloud adoption for small businesses?	BTL2	Understand
21	What pricing mechanisms are employed in market-based cloud computing?	BTL2	Understand
22	How are computational and data requirements handled in scientific cloud applications?	BTL2	Understand
23	What are the advantages of using federated cloud environments in collaborative research?	BTL2	Understand
24	Why is interoperability important among cloud service providers?	BTL2	Understand
	PART-B		
1	Apply cloud computing to design a solution for high-performance scientific simulations.	BTL3	Apply
2	Demonstrate the deployment of a business CRM application on a third-party cloud service.	BTL3	Apply
3	Show how a federated cloud can support global academic collaborations.	BTL3	Apply
4	Illustrate the implementation of a market-based resource allocation model in a multi-cloud environment.	BTL3	Apply
5	Analyze the differences in requirements between scientific and business cloud applications.	BTL4	Analyze
6	Examine the challenges and benefits of cloud federation in cross-border data sharing.	BTL4	Analyze
7	Analyze how market-based resource management affects service provisioning.	BTL4	Analyze
8	Compare third-party cloud services in terms of scalability and security.	BTL4	Analyze

9	Analyze the role of interoperability standards in federated and intercloud environments.	BTL4	Analyze
10	Evaluate the performance of federated clouds for large-scale scientific workloads.	BTL5	Evaluate
11	Assess the viability of third-party cloud services for enterprise software deployment.	BTL5	Evaluate
12	Critically evaluate market-based cloud models against fixed-price models.	BTL5	Evaluate
13	Evaluate the effectiveness of current intercloud architectures for real-time data exchange.	BTL5	Evaluate
14	Design a federated cloud architecture to support international collaborative medical research.	BTL6	Create
15	Create a cloud-based platform for business analytics using third-party cloud services.	BTL6	Create
16	Develop a dynamic resource broker for market-driven cloud allocation strategies.	BTL6	Create
17.	Propose a standardization framework to enable interoperability among multiple cloud providers.	BTL6	Create

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