Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem Examination Dec-2023

CS3EY09 Infrastructure Solutions on Cloud

Programme: B.Tech. Branch/Specialisation: CSE All

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. What is Microsoft Azure? **1**

(a) An Office Suite (b) A Cloud Computing Platform

(c) A Video Game Console (d) A Social Media Platform

ii. What is the purpose of Azure Resource Manager (ARM)? **1**

(a) To play games on Azure

(b) To deploy and manage resources in an organized way

(c) To manage physical servers

(d) To write code in Azure

iii. What is Azure Blob Storage used for? **1**

(a) Running virtual machines

(b) Storing and managing massive amounts of unstructured data

(c) Hosting websites

(d) Creating databases

iv. What is the purpose of Azure Virtual Machine (VM)? **1**

(a) Storing files and documents

(b) Running virtual networks

(c) Providing scalable computing resources

(d) Hosting databases

v. What is the purpose of Azure Load Balancer? **1**

(a) To manage virtual machine images

(b) To distribute incoming network traffic across multiple servers

(c) To control access to Azure Storage

(d) To create virtual networks

P.T.O.

vi. Which type of Load Balancer operates at the Transport Layer (Layer 4) of the OSI model? **1**
(a) Application Gateway (b) Network Load Balancer
(c) Front Door (d) Traffic Manager

vii. What is the purpose of Azure AD Privileged Identity Management (PIM)? **1**
(a) Monitoring user sign-ins
(b) Managing Azure AD roles and permissions
(c) Synchronizing on-premises directories
(d) Configuring conditional access policies

viii. What role does Azure AD play in Azure Resource Manager (ARM) authentication? **1**
(a) It is not involved in ARM authentication
(b) Provides identity for applications and users accessing Azure resources
(c) Manages virtual machine configurations
(d) Monitors network traffic in Azure

ix. What considerations should be taken into account when migrating an on-premise database to SQL Azure? **1**
(a) Compatibility of T-SQL statements
(b) Network bandwidth for data transfer
(c) Both (a) and (b)
(d) None of these

x. What tool is commonly used for migrating on-premise databases to SQL Azure? **1**
(a) SQL Server Management Studio (SSMS)
(b) Azure Data Factory
(c) Azure Database Migration Service
(d) Azure PowerShell

Q.2 i. What is cloud computing? Explain. **2**
ii. Explain Infrastructure virtualization and cloud computing solutions with the help of diagram. **8**
OR iii. (a) Explain cloud computing platform. Also describe the function of Azure platform & virtual machine. **8**
(b) What is utility computing?
(c) What is IaaS, PaaS, and SaaS?

Q.3 i. Compare and contrast the characteristics of Azure Blob Storage, Azure Table Storage, and Azure Queue Storage. **2**
ii. Outline the main features of Azure Storage Services such as Blob Storage, Table Storage, Queue Storage, and File Storage. **8**
OR iii. Why might you need to resize a disk in Azure, and how is it done? What considerations should be taken into account when resizing disks in a live environment? **8**

Q.4 i. What is Azure Virtual Network? **3**
ii. What is a virtual appliance, and how does it differ from a traditional hardware appliance in a network environment? Explain with suitable examples. **7**
OR iii. What is a Network Security Group (NSG) in the context of Azure virtual networks, and how does it contribute to network security? **7**

Q.5 i. What distinguishes Azure Active Directory (Azure AD) from on-premises Active Directory? **2**
ii. Discuss the importance of identity management in a cloud computing environment. How does it differ from traditional on-premises identity management? **8**
OR iii. Explain the concept of Azure AD Connect and its role in synchronizing on-premises Active Directory with Azure AD. What considerations should be taken into account during this synchronization process? **8**

Q.6 Attempt any two:
i. Explain different methods for adding data to a table in SQL Azure. How does this process differ from traditional on-premise databases? **5**
ii. (a) Define threat Agents? Explain their role in cloud security. **5**
(b) What are security services in the cloud?
iii. Outline the steps involved in migrating an on-premise database to SQL Azure. What challenges might be encountered during this migration process? **5**

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CS3EYo9

1. D.
2. B.
3. B
4. C
5. B
6. B
7. B
8. B
9. C
10. C

Q.2(i) Definition.

(ii) Infrastructure Virtualization

a) Definition

b) Server Virtualization

c) Benefits
- Resource optimization
- Isolation
- Flexibility
- Disaster recovery

d) Hypervision

Cloud computing

a) Definition

b) Service Models

c) Iaas

ii) Paas

iii) Saas

c) Deployment Models
- Public Cloud
- Private Cloud
- Hybrid Cloud

d) key characteristics
- on-demand self service
- Broad Network access
- Resource Pooling
- Rapid elasticity

e) Benefits
- Cost-efficiency, Scalability, Accessibility

(iii) Definition of cloud computing. - 2

(a) Functions of Azure & VM. - 2

(b) Utility computing - 2

(c) Iaas, Paas, Saas - 2 -

3) (i) attributes of Azure Blob, Azure Table, Azure Queue

(a) → Blobs

(I) Scalability & Performance

(II) Storage Tiers

(III) Security → Encryptions

→ Role based Access Control

(IV) Data Lifecycle Mgmt

(V) Versioning, Triggers, CDN integration

(VI) Blob indexer.

→ Table

↳ Nosql Data Store
↳ Scalability
↳ key-value Pairs
↳ Partitioning
↳ Query language

↳ Restful API.
↳ Cost-effective
↳ Development libraries.

→ Queue Storage
- Asynchronous communication
  - Decoupling
  - Simple queue model
  - Message visibility timeout
  - Scalability
  - Multiple language Support
  - Integration with Azure functions

File Storage
- Server Message Block
  - Fully Managed
  - Elastic Scalability
  - Cross Platform Access
  - Data Redundancy.
  - Integrate with Azure Active Directory.
- Restful API.

(ii) 3. Resizing VM is needed in order for
a) Increased Storage Requirements
b) Application Growth
c) Performance optimization
d) O.S. & Software Updates
e) Data Migration
f) Infra Scaling
g) Temporary Resource Needs
h) Flexibility in Resource Mgmt

4 (i) AVN → definition and fundamental concepts. (1.5)

(ii) Azure VM vs. Traditional HW. (1.5).
a) Physical HW / virtual
b) Resource Ownership
c) Scalability & Flexibility
d) Flexibility & Agility
b) Pay as you go
c) Integrate with cloud

4 (iii) → Traffic filtering
- rule based access control
- Inbound & outbound rules
- association with subnets & NICs.
- Default Rules
- Stateful Filtering
- Priority & Rule Overlapping
- Azure Portal / Powershell, Azure CLI
- Dynamic Address.

5
(i) difference - 2 marks.
(ii) Security, Privacy, Compliance of cloud-based systems.
- user Identities
- authentication
- Authorization
- Lifecycle Mgmt
- audit & Monitoring
- Compliance & governance
- encryption & data protection

(iii)
a) Azure AD connect
b) Password Synchronization
c) High availability & Disaster Recovery
d) Filtering & Scoping
e) Attribute Mapping & Customization
f) Group Considerations

5) (i) g) User Principal Name (UPN) & Alternate login ID

h) Coexistence with federation

i) Directory Integration

j) Security & Compliance

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6) (i) a) use transact-SQL statements

(ii) use BCP from the command prompt

(iii) use the import Flat file wizard

(iv) use the SQL Server Import & Export wizard

(v) Design your own import or export

(b) (i) → a) Hackers

b) Malware

c) Insiders (i) Scan for issues

(ii) customize security settings

(b) (ii) → Identity & access mgmt

↳ Data loss prevention

↳ security Information & event mgmt

↳ Business continuity & disaster recovery

6 (ii) → Assessment & planning. Data Migration Assistant

- Azure Subscription & Resources Setup.
- Network Config.
- Choose migration method
  - O/L migration
  - offline migration
- Data migration
- Schema & code changes
- Security configuration
- Testing
- Backup & Rollback
- Monitoring & optimization
- Documentation
- Post-migration verification
- Monitoring & maintenance