

2125  
M.E. Computer Science and Engineering (Cyber Security)  
First Semester  
Core- III CSN-8103: Cloud Computing and Big Data

Time allowed: 3 Hours

Max. Marks: 50

**NOTE:** Attempt five questions in all, including Question No. 1 (Section-A) which is compulsory and selecting two questions each from Section B-C.

x-x-x

**SECTION-A**

- Q1. a) What are the main layers of cloud computing architecture?  
b) Explain the role of the cloud service provider in security?  
c) What is data breach risk in cloud computing?  
d) Explain VM isolation in virtualization security?  
e) What is the significance of multi-tenancy in cloud storage?  
f) How shared responsibility model works in cloud security?  
g) What is the purpose of a hypervisor?  
h) How data redundancy works in cloud storage?  
i) What is identity and access management (IAM) in cloud?  
j) Give real time examples and applications of cloud-based collaboration? 10

**SECTION-B**

- Q2. Explain the key architectural components of cloud computing along with virtualization, resource pooling, network infrastructure, service orchestration, and cloud management tools. How do these components work together to enable scalable and elastic cloud services? 10
- Q3. How has distributed computing influenced the architecture of cloud platforms? Explain the role of distributed storage systems, distributed processing, and distributed databases in shaping cloud services. 10
- Q4. Discuss in detail the security challenges of storing sensitive data in the cloud. How do data confidentiality, data integrity, and data availability risks arise? How do weak credentials, poor access policies, and misconfigured Identity and Access Management settings expose cloud resources? 10

**SECTION-C**

- Q5. a) Explain the major security challenges associated with Virtual Machines  
b) Describe hypervisor security in detail. How do Type-1 and Type-2 hypervisors differ in security architecture, and what techniques are used to protect the hypervisor layer from attacks? 10
- Q6. a) Explain the architecture of cloud-based file storage systems with real time case study  
b) Explain how cloud-based backup systems work. Describe backup models such as full backup, incremental backup, differential backup, and continuous data protection and discuss how these are implemented in cloud platforms. 10
- Q7. Explain the following with respect to cloud:  
a) collaboration through web-based tools  
b) role do social media platforms play in collaboration  
c) role of streaming video content support remote teamwork and communication  
d) advantages of using cloud-based collaboration apps like Google Workspace or Microsoft 365  
e) working of cloud storage in improving sharing and co-editing of documents, images, and media files 10