(2½ hours) **Total Marks: 60**

N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt *any two* of the following: **12**

a. What are the core elements of a Data Center? What are the key characteristics of a Data Center?
b. What are the factors affecting the disk drive Performance? Explain with the example.
c. Explain the different Interface Protocols enabling the communication between the host and storage.
d. Compare and contrast RAID 3, RAID 4, RAID 5.

2. Attempt *any two* of the following: **12**

a. Explain with a neat diagram the components of Fiber Channels (FC) storage Area Networks
b. Explain in brief components of an Intelligent Storage System.
c. Discuss different iSCSI Topologies with neat diagrams.
d. What is Virtual Storage Provisioning? How it differs from traditional storage provisioning?

3. Attempt *any two* of the following: **12**

a. Explain the components and benefits of NAS.
b. Explain need, purpose and considerations of backup.
c. Write detail note on Content Addressed Storage.
d. Discuss different backup topologies.

4. Attempt *any two* of the following: **12**

a. What are the uses of local replications?
b. What are different Host-Based Local replication technologies?
c. Explain storage array-based remote replication.
d. Discuss cloud Deployment models.

5. Attempt *any two* of the following: **12**

a. Explain the different types of security threats.
b. Discuss security solutions for IP-SAN.
c. Explain the different aspects of NAS Security.
d. What are the different components are to be monitored in the Storage Infrastructure?

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