USN ☐☐☐☐☐☐☐☐☐☐   **18CS822**

Eighth Semester B.E. Degree Examination, June/July 2023
Storage Area Networks

Time: 3 hrs.   Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Define data center. List and explain the key elements of data center. Explain the characteristics of data center elements with diagram. **(10 Marks)**
   b. Explain with neat diagram the evolution of storage architecture. **(06 Marks)**
   c. With diagram explain about compute virtualization. **(04 Marks)**

OR

2 a. Explain disk drive components with diagram. **(10 Marks)**
   b. Discuss disk service time and disk I/O controller utilization. **(10 Marks)**

Module-2

3 a. List the different RAID levels where parity technique has been adopted. Explain any three. **(10 Marks)**
   b. Different between software and hardware RAID. **(04 Marks)**
   c. With diagram explain different RAID techniques. **(06 Marks)**

OR

4 a. Explain types of Intelligent storage systems. **(10 Marks)**
   b. Explain with neat diagram the components of fibre channel storage area networks. **(10 Marks)**

Module-3

5 a. Discuss different iSCSI topologies with neat diagram. **(06 Marks)**
   b. Briefly explain about iSCSI protocol stack. **(04 Marks)**
   c. Explain the components of NAS with neat sketch. Briefly explain the benefits of NAS. **(10 Marks)**

OR

6 a. Explain NAS implementations in detail. **(06 Marks)**
   b. Discuss about NAS file sharing protocols. **(04 Marks)**
   c. With diagram explain about FCIP protocol stack and FCIP topology. **(10 Marks)**

Module-4

7 a. Describe failure analysis in business continuity. Mention important BC technology solutions. **(10 Marks)**
   b. With a neat diagram, explain the steps involved in backup and restore operation. **(10 Marks)**

OR

8 a. What is business continuity? Explain the BC terminology in detail. **(10 Marks)**
   b. Discuss different backup topologies. **(10 Marks)**

Module-5

9 a. Explain FC SAN security architecture and IPSAN security implementations with diagram.
      (10 Marks)

   b. Explain the following :
      i) Uses of local replica
      ii) LVM based replication
      iii) Full volume mirroring
      (10 Marks)

OR

10 a. Explain storage security domains.
      (10 Marks)

   b. What is remote replication? Explain storage array based remote replication.
      (10 Marks)

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