MANIPAL INSTITUTE OF TECHNOLOGY, MANIPAL 576104

(Constituent College of Manipal University)

SEVENTH SEMESTER B.TECH. (IT) DEGREE END SEMESTER EXAMINATION, DEC – 2015
SUBJECT: PROGRAM ELECTIVE-II STORAGE DEVICE TECHNOLOGY – ICT 417
(REVISED CREDIT SYSTEM)

TIME: 3 HOURS   **5/12/2015**   **MAX. MARKS: 50**

Instructions to candidates
    Answer any **FIVE FULL** questions.
    Missing data, if any, may be suitably assumed.

1A. What is a PowerPath? With the help of examples, explain how PowerPath performs path failover operations in the event of a path failure for active-active and active-passive array configuration. What are the causes of Information Unavailability?

1B. Explain the core elements of a data center. Consider the example of an order processing system and explain the involvement of the data center elements. What are the key challenges in managing information?

1C. Which are the types of Intelligent Storage Array? Discuss each.

[5+3+2]

2A. With the help of suitable diagrams, explain the components of an Intelligent Storage System.

2B. Discuss the physical components of a Host. Explain the concept of logical block addressing.

2C. State the differences between RTO and RPO.

[5+3+2]

3A. Which are the different categories of backup granularity? Explain each with the help of an example. Explain the differences between SAN based and mixed backup topology.

3B. Draw the SCSI command descriptor block and explain its structure.

3C. Diagrammatically explain the iSCSI protocol layers and encapsulation order of SCSI commands for their delivery through a physical layer.

[5+3+2]

4A. Discuss any four features of CAS. Explain the process of storing and retrieving objects in CAS with suitable diagrams. Discuss any one CAS solutions that organizations adopt to solve business problems.

4B. List the components of NAS? Explain the two major types of NAS implementations.

4C. Explain with a suitable diagram Server virtualization and Storage virtualization.

[5+3+2]

5A. The average I/O size of an application is 64KB. The following specifications are available from the disk manufacturer: average seek time=5ms, 7,200 rpm, transfer rate=40 MB/s. Determine the maximum IOPS that could be performed with the disk for this application. Taking this case as an example, explain the relationship between disk utilization and IOPS. Why do formatted disks have less capacity than unformatted disks?

5B. The IT department of a department store uses tape to archive data. Explain 4–5 major points you could provide to persuade the IT department to move to a CAS solution. How would your suggestions impact the IT department?

5C. Which are the different types of ports? Represent them in a fabric.

[5+3+2]

6A. An application has 1,000 heavy users at a peak of 2 IOPS each and 2,000 typical users at a peak of 1 IOPS each, with a read/write ratio of 2:1. It is estimated that the application also experiences an overhead of 20 percent for other workloads. Calculate the IOPS requirement for RAID 1, RAID 3, RAID 5, and RAID 6. Why is RAID 1 not a substitute for a backup? What are the benefits of using RAID 3 in a backup application?

6B. Discuss the advantages of FC-SW over FC-AL. Describe the process of assigning FC address to a node when logging in to the network for the first time.

6C. Explain SCSI-3 client server model with the help of suitable figure.

[5+3+2]

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