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Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020
Storage Area Networks

Time: 3 hrs.

Max. Marks: 100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART – A

1. a. Explain the evolution of storage technology from non intelligent internal storage to intelligent network storage. (10 Marks)
- b. What are the key requirements for data center elements? (05 Marks)
- c. Consider a disk I/O system in which an I/O request arrives at the rate of 80IOPS. The disk service time is 6 ms. Compute (i) Utilization of I/O controller (ii) Total response time (iii) Average queue size (iv) Total time spent by a request in a queue. If the controller power is doubled or service time is halved, what is the utilization? (05 Marks)
2. a. Compare RAID5 and RAID6. (05 Marks)
- b. With neat diagrams, explain the structure, read and write operations in cache. (10 Marks)
- c. An application has 1000 heavy users at a peak of 2 IOPS each and 2000 typical users at a peak of 1 IOPS each, with a read / write ratio of 2 : 1. It is estimated that application also experiences an overhead of 10 percent for other work loads. Calculate IOPS requirement for RAID 1, RAID 3, RAID 5 and RAID 6. (05 Marks)
3. a. Write about SCSI-3 architecture, with a neat diagram. (05 Marks)
- b. What is the significance of various layers of SCSI communication model? (05 Marks)
- c. Explain the three basic connectivity options in FC architecture. (10 Marks)
4. a. What is NAS? What are its benefits? (10 Marks)
- b. Write a note on iSCSI. (10 Marks)

PART – B

5. a. Explain the features and benefits of CAS. (10 Marks)
- b. What is virtualization? Elaborate on the types of storage virtualization. (10 Marks)
6. a. Define the following terms:
 - (i) Disaster recovery (ii) Disaster restart (iii) Recovery point objective
 - (iv) Recovery time objective. (10 Marks)
- b. Explain the three basic topologies used in backup environment. (10 Marks)
7. a. Differentiate between full volume mirroring and pointer based full volume replication. (10 Marks)
- b. What are the basic approaches to host based remote replication? (10 Marks)
8. a. What are the primary security attributes? (05 Marks)
- b. Explain the various management tasks in which a storage infrastructure can be classified. (10 Marks)
- c. Write a note on threats. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.