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**Eighth Semester B.E. Degree Examination, June 2012**  
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. With a neat block schematic, explain the server centric IT architecture and bring out its limitations. (12 Marks)
- b. Explain with a neat diagram, the working and advantages of storage centric IT architecture. (08 Marks)
- 2 a. With a neat diagram, explain the architecture of intelligent disk subsystems and also discuss the methods to increase the access rate. (08 Marks)
- b. With a neat block diagram, explain the working of RAID 0+1 and compare it with RAID 10. (06 Marks)
- c. With a neat block diagram, explain the working RAID level 4 and illustrate with an example how the reliability of the data is ensured. (06 Marks)
- 3 a. Compare the RAID levels with respect to fault tolerance, read/write performance and space requirement. (06 Marks)
- b. Describe all the methods to accelerate hard disk access. (04 Marks)
- c. With a neat diagram, explain the functions of all the layers of fibre channel protocol stack. (10 Marks)
- 4 a. Discuss with illustrative diagrams, the following IP storage standards:  
i) iSCSI                      ii) iFCP                      iii) FCIP (09 Marks)
- b. With a neat block schematic, explain all the components of NAS hardware. (07 Marks)
- c. With a neat block diagram, explain the NAS software components. (04 Marks)

**PART – B**

- 5 a. With a neat block schematic, explain all the layers of a local file system. (06 Marks)
- b. Discuss Journaling and snapshot features of a file system. (06 Marks)
- c. What is storage virtualization? What are its advantages? With a neat diagram, explain storage virtualization at block level. (08 Marks)
- 6 a. Discuss with neat block diagrams, storage virtualization at server, network and storage levels along with their advantages and disadvantages. (12 Marks)
- b. Explain the working of asymmetric storage virtualization and compare it with symmetric virtualization. (08 Marks)
- 7 a. With neat block schematics, explain the following SAN components:  
i) Network part                      ii) Software part                      iii) Hardware part. (09 Marks)
- b. With a neat block schematic, explain the uses of various types of parts of a SAN switch. (05 Marks)
- c. Explain the functions of switch's operating system. (06 Marks)
- 8 Write short notes on:
  - a. Data storage and access problem
  - b. 8b/10b encoding technique
  - c. Host bus adaptor
  - d. NAS as a storage system. (20 Marks)