BE12-R4: INFORMATION STORAGE AND MANAGEMENT

«QP_SRLNO»

NOTE:

1. **Answer question 1 and any FOUR from questions 2 to 7.**
2. **Parts of the same question should be answered together and in the same sequence.**

Time: 3 Hours **Total Marks: 100**

1.

a) Discuss the benefits of Content Addressable Storage (CAS). Explain why it is faster.
b) Why Direct-Attached Storage (DAS) provides a lower initial investment alternative to other storage networking solutions?
c) Describe the factors that determine the serial or parallel data transfer in a DAS implementation.
d) Briefly discuss the benefits of fibre channel SANs.
e) You have decided to use a RAID 5 solution for your environment. You have eleven 1TB drives that you want to use for this configuration. How much practical storage space is available?
f) What is Zoning and its types? Briefly discuss the reasons to Zone a network.
g) What is the difference between Data Management and Information Lifecycle Management (ILM)?

(7x4)

2.

a) What are the types of SAN architectures? Write down the advantages of SAN. Differentiate between SAN and NAS.
b) What is Hierarchical Storage Management (HSM)? Why it exist? Also, discuss the advantages of it?
c) Define Logical Unit Number (LUN). Differentiate between LUN Zoning and LUN Masking.

(6+6+6)

3.

a) What is the need of securing the SAN fabric? What are the methods used for securing a SAN fabric.
b) Consider an application that generates 5200 I/Os per second, with 60 percent of them being reads. Also, the write penalty for RAID 5 is 4 and every write manifests as two writes to the disks in RAID 1. If an HDD with a specification of a maximum 180 IOPS for the applications needs to be used, then calculate the number of disks required to meet the workload for the RAID 1 and RAID 5 configurations.

(9+9)

4.

a) What are the benefits of IP Storage system? Compare and contrast the features of IP network storage transport standards (iSCSI, FCIP and iFCP).
b) What is Cache? A power failure or any kind of cache failure will cause the loss of data not yet stored on the disk. Discuss the cache mirroring and cache vaulting methods of mitigating the risk of losing uncommitted data held in cache.

(9+9)

5.

a) What does NFS and CIFS stands for? Compare and contrast the features of these two systems.
b) What is Wide Area File Services (WAFS)? Discuss the benefits of WAFS.
c) Define NAS. List the components used in NAS device. Briefly explain the benefits of NAS.

(6+6+6)

6.

a) List the benefits of SAN management interface (SMI-S) to users and vendors. How SMI-S simplifies the SAN management?

b) Consider a disk I/O system in which an I/O request arrives at a rate of 150 I/Os per second. The disk service time is 10 ms. Now, the controller power is doubled and the service time is halved. Consequently, compute the following:

i) Utilization of I/O controller.
ii) Total response time.
iii) Average queue size
iv) Total time spent by a request in queue.

(9+9)

7.

a) Variations of core-edge fabric and mesh topologies are most commonly deployed in SAN implementations to connect devices. Discuss the benefits and limitations of core-edge fabric topologies. Also, explain how partial mesh topology is different from full mesh topology?

b) What is Direct-Attached Storage (DAS)? What are the benefits and limitations of DAS? How internal DAS is different from external DAS?

(9+9)