BE12-R4: INFORMATION STORAGE & MANAGEMENT

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) Briefly discuss some of the factors that have contributed to the growth of digital Data.
b) What is Host Bus Adapter? What are the benefits of using multiple HBAs on Host?
c) When choosing a RAID Type, why is it important to consider the impact of disk performance?
d) What is LUN? Why LUN masking is required?
e) What are the various fibre channel ports on the switch?
f) Briefly discuss General-Purpose Servers Vs NAS Devices.
g) What is business connectivity (BC) planning lifecycle? List various stages of BC planning lifecycle.

(7×4)

2.

a) The marketing department at a mid size firm is expanding. New hires are being added to the department and they are given network access to the department's file. IT has given marketing a networked drive on the LAN, but it keeps reaching capacity every third week. Current capacity is 500 gigabytes (and growing) with hundreds of files. Users are complaining about LAN response times and capacity. As IT manager, what would you recommend to improve the situation?
b) An engineering design department of a large company maintains over 6,00,000 engineering drawings that its designers access and reuse in their current projects, modifying or updating them as required. The design team wants instant access to the drawings for its current projects, but is currently constrained by an infrastructure that is not able to scale to meet the response time requirement. The team has classified the drawings as "most frequently accessed," "frequently accessed," "occasionally accessed" and "archive".
   i) Suggest a strategy for design department that optimizes the storage infrastructure by using ILM?
   ii) Explain how will you use "tiered storage" based on access frequency?
   iii) Detail the hardware and software components you will need to implement your strategy.

(6+12)

3.

a) i) Which components constitute the disk service time? Which component contributes the largest percentage of the disk service timer in a random I/O operation? Discuss.
   ii) Why do formatted disks have less capacity than unformatted disks?
b) Consider a disk I/O system in which an I/O request arrives at the rate of 80 IOPS. The disk service time is 6 ms. Compute the following:
   i) Utilization of I/O controller
   ii) Average Queue size
   iii) Total time spent by a request in a queue

(9+9)

4.

a) Discuss the impact of random and sequential I/O in different RAID configurations.
b) A 10K RPM drive is rated to perform 130 IOPS and a 15K RPM drive is rated to perform 180 IOPS for an application. The read/write ratio is 3:1. Compute the RAID-adjusted IOPS for the 10K and 15K drives for RAID 1, Raid 5, and RAID 6.

(9+9)

5.

a) What is zoning? Discuss a scenario
   i) where soft zoning is preferred over hard zoning
   ii) where hard zoning is preferred over soft zoning

b) Explain how the performance of NAS can be affected if the TCP window size at the sender and the receiver are not synchronized?

(9+9)

6.

a) To access data in a SAN, a host uses a physical address known as logical block address (LBA). A host using a CAS device do not use (or need) a physical address. Why?

b) What is intelligent storage system? Discuss various components of an intelligent storage system?

(9+9)

7. Briefly describe the followings:

a) SCSI Command Model

b) Components of SAN

c) NAS File-Sharing Protocols

(6+6+6)