**ADICHUNCHANGIRI UNIVERSITY**

**18CS734 SEMESTER: VII**

**(CBCS Scheme)**

Time:**3 Hours** Max Marks:**100 Marks**

**Sub: Storage Area Networks**

**Note: Answer any FIVE full questions, choosing ONE question from each module**

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| **Module 1** | | |  |
| **1.** | **a.** | **Zone bit recording:**  Explanation(2m)+Diagram(2m)    **Logical addressing**: Explanation(2m)+Diagram(2m) | 4+4=8 |
|  | **b.** | **Availability:**  .**Security:**  **Scalability:**  **Performance:**  **Data integrity:**  **Capacity: (7\*1=7m)+diagram(1m)**  **Manageability:** | 7+1=8M |
|  | **c.** | Reporting  Mirroring  Provisiong **Listing(2m)+Explanation(2m)** | 2+2=4M |
|  |  | OR |  |
| **2.** | **a.** | *Disk service time* is the time taken by a disk to complete an I/O request. **(1m)**  ***Seek Time (2m)***  ***Rotational Latency (2m)***  ***Data Transfer Rate (3m)*** | **1+2+2+3=8M** |
|  | **b.** | Definition. **(1m)**  Process of mapping:  1. Files are created and managed by users and applications.  2. These fi les reside in the fi le systems.  3. The fi le systems are mapped to fi le system blocks.  4. The fi le system blocks are mapped to logical extents of a logical volume.  5. These logical extents in turn are mapped to the disk physical extents either  by the operating system or by the LVM.  6. These physical extents are mapped to the disk sectors in a storage subsystem.  **Explanation(4m)**  **Diagram(3m)** | 1+4+3=8M |
|  | **c.** | **Explanation(2M)+Diagarm(2M)** | 2+2=4M |
|  |  | **Module 2** |  |
| **3.** | **a.** | RAID Techniques are,  1.Striping  explanation(2m)fig(1m)  2.Mirroring  Explanation(1m)+Fig(1m)  3.Parity  Explanation(2m)+Fig(1m) | **3+2+3=8M** |
|  | **b.** | Components  1.Front end  2. Cache  3. Back end  4.Physical disk **Explanation(6m)** +Diagram(2m) | **8** |
|  | **c.** | **RAID Implementation Methods:**  **Software RAID:**  **Hardware RAID: Explanation(2\*2=4m)** | **2+2=4** |
|  |  | **OR** |  |
| **4.** | **a.** |  | 2\*4=8 |
|  | **b.** | Explanation(5M)+Diagram(3M) | 5+3=8M |
|  | **c.** |  | 2+2=4 |
|  |  | **Module 3** |  |
| **5.** | **a.** | **Explanation(4m)+Diagram(4m)** | **4+4=8M** |
|  | **b.** | Comprehensive access to information  Improved efficiency  Improved flexibility  Centralized storage  Simplified management  Scalability  High availability  Security  Low cost  Ease of deployment  explanation of any 8 ->8\*1=8m | **8\*1=8M** |
|  | **c.** | Explanation + Diagram=2+2=4 | **2+2=4M** |
|  |  | **OR** |  |
| **6.** | **a.** | 1.NFS(5m)  2.CIFS(3m) | 5+3=8M |
|  | **b.** | Number of hops:  Authentication with a directory service such as Active Directory or NI  Retransmission  Overutilized routers and switches:  File system lookup and metadata requests  Over utilized NAS devices  Over utilized clients **Explanation(6m)**  **Diagram(2m)** | 6+2=8M |
|  | **c.** | **Explanation(2m)+Diagram(2m)** | 2+2=4M |
|  |  | **Module 4** |  |
| **7.** | **a.** | **BC Terminologies**  Disaster recovery  Disaster restart  Recovery-Point Objective (RPO)  Recovery-Time Objective (RTO)  Data vault  Hot site  Cold site  Server Clustering (8\*1=8m) | **8\*1=8M** |
|  | **b.** | Explanation(4m)+Diagram(4m) | 4+4=8M |
|  | **c.** | Explanation(2m) Diagram(2m)=2+2=4 | 2+2=4M |
|  |  | **OR** |  |
| **8.** | **a.** | Explanation(5m)+ Diagram(3m) | 5+3=8M |
|  | **b.** | **Direct-attached backup topology: Explnation(2m)+Diagram(2m)**    **LAN-based backup topology : Explnation(2m)+Diagram(2m)** | 4+4=8M |
|  | **c.** | Explnation(2M)+Diagram(2M) ) | 2+2=4M |
|  |  | **Module 5** |  |
| **9.** | **a.** | Host-Based Local Replication  LVM-Based Replication : Explanation(2m)+Diagram(2m)    File System snapshot: Explanation(2m)+ Diagram(2m) | 4+4=8M |
|  | **b.** | **Explanation(3M)+Diagram(5M)** | 3+5=8M |
|  | **c.** | Source  Point-in-Time (PIT) and continuous replica  Target  Recoverability and restartability (4\*1=4m) | 1\*4=4M |
|  |  | **OR** |  |
| **10.** | **a.** | **Explanation(2m)+Diagram(2m)**    **Explanation(2m)+Diagram(2m)** | **4\*2=8M** |
|  | **b.** | Host-based remote replication:  **LVM-Based**: Explanation(2m)+Diagram(2m)    **Host-based log shipping**: Explanation(2m)+Diagram(2m): | **4\*2=8M** |
|  | **c.** | **Goals are,**Confidentiality  Integrity  Availability  Accountability of service (4\*1=4m) | **1\*4=8M** |