

BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

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Course Code

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Eighth Semester B.E. Degree Examinations, April/May 2025

STORAGE AREA NETWORK

(Computer Science & Engineering)

Duration: 3 hrs

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Missing data, if any, may be suitably assumed

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO:PI)</u>
<u>Module-1</u>			
1.	a. What is data? Illustrate with a neat diagram the different types of data with example.	05	(3 :1: 2.6.2)
	b. What are core elements of data center? Demonstrate with a neat diagram the process of online order transaction system.	10	(2 :1: 2.6.2)
	c. Write short notes on virtualization and cloud computing.	05	(3 :1: 2.6.2)
(OR)			
2.	a. What is connectivity? Interpret with a neat diagram the physical and logical components of connectivity.	08	(3 :1: 2.6.2)
	b. Examine how disk service time, rotational latency, and data transfer rate are calculated in measuring the disk performance.	06	(3 :1: 1.6.1)
	c. What is DAS? Illustrate with a neat diagram Internal and external DAS architecture.	06	(3 :1: 2.6.2)
<u>Module-2</u>			
3.	a. Consider an application that generates 5,200 IOPS, with 60 percent of them being reads. (i) Calculate the disk load in RAID 5 and RAID 6. (ii) Calculate the number of disks required for the application. HDD (hard Disk Drive) with a specification of a maximum 180 IOPS is used. <i>Hint: Write penalty in RAID 5 is 4 Write penalty in RAID 6 is 6</i>	08	(3 :2: 2.8.1)
	b. List the different RAID levels where parity techniques have been adopted. Interpret any 3 in detail.	06	(3 :2: 2.6.2)
	c. Discuss various command queuing algorithms	06	(2 :2: 2.6.2)
(OR)			
4.	a. Interpret with a neat diagram the structure of cache and its read and write operations.	10	(3 :2: 2.6.2)
	b. List and explain types of intelligent storage systems.	05	(2 :2: 2.6.2)
	c. Discuss the following components of FC-SAN (i) Cabling (ii) Interconnecting Devices	05	(2 :2: 2.6.2)
<u>Module-3</u>			
5.	a. Illustrate with neat diagram different iSCSI topologies.	06	(3 :3: 3.8.3)
	b. Interpret with neat diagram iSCSI protocol stack.	08	(3 :3: 3.8.3)
	c. Describe the different ways of establishing the communication between initiators and targets using iSCSI names.	06	(2 :3: 3.6.2)

Note: (RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI- Performance Indicator)

(OR)

6. a. Illustrate with figure the various components of NAS. 08 (3 :3: 3.8.3)
b. Illustrate with neat diagram gateway network attached storage connectivity. 06 (3 :3: 3.8.3)
c. Classify the different types of NAS file sharing protocols. 06 (3 :3: 3.6.2)

Module-4

7. a. What is business continuity? Describe BC terminology in detail. 06 (2 :4: 2.6.2)
b. Describe failure analysis in BC. Demonstrate with figure how to mitigate single point of failure. 08 (2 :4: 2.7.1)
c. What is business impact analysis? Explain the various tasks involved in it. 06 (2 :4: 2.6.2)

(OR)

8. a. Write a short note on (i) Backup architecture (ii) Backup Purpose 06 (3 :4: 2.6.2)
b. Interpret with figure backup and restore operations. 08 (3 :4: 2.6.2)
c. Illustrate with a figure any three different ways of performing backup in NAS environment. 06 (3 :4: 2.6.4)

Module-5

9. a. What is local replication? Describe the uses of local replica. 06 (2 :5: 3.8.3)
b. Mention the different local replication technologies. Interpret in detail LVM-based replication. 08 (3 :5: 3.6.2)
c. Describe any one storage array based local replication in detail. 06 (2 :5: 3.8.3)

(OR)

10. a. Illustrate with figure array based synchronous and asynchronous remote replication. 08 (3 :5: 3.6.2)
b. Discuss the four security goals which are achieved through information security framework. 06 (2 :5: 3.6.3)
c. List the different security domains of data storage. Explain any one with figure. 06 (2 :5: 3.6.2)

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