

MCSE324/MCNE324

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RAMAIAH Institute of Technology

(Autonomous Institute, Affiliated to VTU) (Approved by AICTE, New Delhi & Govt. of Karnataka) Accredited by NBA & NAAC with 'A+' Grade

SEMESTER END EXAMINATIONS - FEBRUARY / MARCH 2023

M.Tech:- Computer Science and

Program : Engineering / Computer Network Semester : III

Engineering

Course Name : Storage Area Networks Max. Marks : 100
Course Code : MCSE324 / MCNE324 Duration : 3 Hrs

Instructions to the Candidates:

Answer one full question from each unit.

UNIT - I

1.	a)	Discuss the process of mapping user files to the disk storage with a neat	CO1	(80)
		diagram.		

- b) Identify the three physical components of connectivity between the host CO1 (06) and storage.
- c) Explain the Key Characteristics of a Data Center. CO1 (06)
- 2. a) Examine the factors that affect the Hard disk performance? And also CO1 (08) analyze the IOPS requirement of an application, how it affects the average response time?
 - b) Explain the Architecture of Flash Drives with a neat diagram. Also list the CO1 (08) Components of Flash Drives.
 - c) List any 4 DAS Benefits and Limitations. CO1 (04)

UNIT - II

- 3. a) Consider an application that generates 5,200 IOPS, with 60 percent of CO2 (08) them being reads.
 - i. Calculate the disk load in RAID 5, RAID 1 and RAID 6.
 - Calculate the number of disks required for the application. HDD (hard Disk Drive) with a specification of a maximum 180 IOPS is used.
 - b) Differentiate between software and hardware RAID. Illustrate how parity CO2 (06) method is used for RAID levels.
 - c) What is Hotspare. Justify how Hotspare will be used in the event of disk CO2 (06) failure.
- 4. a) Illustrates a single write operation on RAID 5 that contains a group of CO2 (08) five disks.
 - b) Describe with a neat block diagram the components of Intelligent CO2 (08) storage system.
 - c) Justify that Thin LUNs are appropriate for applications that can tolerate CO2 (04) performance variations.

UNIT - III

5.	a)	Explain the Fibre Channel Protocol Stack and key advantages of FCP.	CO3	(07)
	h)	Discuss different iSCSI Topologies with a neat diagram.	CO3	(06)

- c) Compare the types of ports in a switched fabric with the neat diagram. CO3 (07)
- 6. a) With a neat diagram, identify the various fields of FCoE Frame Structure. CO3 (08)
 - b) Compare and contrast point-to point, arbitrated loop, and fibre Channel CO3 (08) switched fabric interconnectivity options in FC architecture.
 - c) Categorize the types of Zoning. CO3 (04)

MCSE324/MCNE324

UNIT-IV

7.	a)	Determine the issues associated with IP network that affect NAS performance.	CO4	(06)
	b) c)	•	CO4 CO4	(06) (08)
8.	a) b)	What is NAS? Discuss the three common NAS implementations. Explain the process of storing objects and retrieving objects in object-based storage devices(OSD) with a neat diagram.	CO4 CO4	(10) (10)
9.	a) b) c)	Explain the set of tasks involved in business impact analysis. With a neat sketch explain the BC planning life cycle stages. A storage array dials a support center automatically whenever an error is detected. The vendor's representative at the support center can log on to the service processor of the storage array through the Internet to perform diagnostics and repair. Discuss the security concerns in this environment and provide security methods that can be implemented to mitigate any malicious attacks through this gateway.	CO5 CO5 CO5	(07) (06) (07)
10.	a)	A system has three components and requires all three to be operational	CO5	(80)

10. a) A system has three components and requires all three to be operational CO5 (08 during 8 am to 5 pm, business hours are Monday through Friday.

Failure of component 2 occurs as follows:

- Monday = 8 am to 11 am
- Tuesday = No failure
- Wednesday = 4 pm to 7 pm
- Thursday = 5 pm to 8 pm
- Friday = 1 pm to 2 pm

Calculate the MTBF, MTTR and availability of component 2.

- b) Illustrates the example for importance of monitoring security in a CO5 (08) storage array with neat diagram.
- c) Justify how implementing an ILM strategy will directly address the CO5 (04) challenges of information management.
