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SEMESTER END EXAMINATIONS – JANUARY 2020

Program	:	M.Tech. : ComputerNetwork Engineering	**Semester**	:	III
Course Name	:	**Advances in Storage Area Networks**	**Max. Marks**	:	**100**
Course Code	:	MCNE06	**Duration**	:	**3 Hrs**

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT-I

1.	a)	Describe host access to storage through direct-attached storage (DAS) with its Benefits and Limitations.	CO1	(06)
	b)	Compare and contrast journaling file system or a nonjournaling file system.	CO1	(06)
	c)	Discuss the factors that affect the Hard disk performance? And also analyze the IOPS requirement of an application, how it affects the average response time?	CO1	(08)
2.	a)	A hospital uses an application that stores patient X-ray data in the form of large binary objects in an Oracle database. The application is hosted on a UNIX server, and the hospital staff accesses the X-ray records through a Gigabit Ethernet backbone. An EMC CLARiiON storage array provides storage to the UNIX server, which has 6 TB of usable capacity. Explain the core elements of the data center. What are the typical challenges the storage management team may face in meeting the service-level demands of the hospital staff? Describe how the value of this patient data might change over time.	CO1	(09)
	b)	Explain the three physical components of connectivity between the host and storage.	CO1	(05)
	c)	Explain the Compute virtualization technique to abstract the physical hardware from the operating system. What is the role of Desktop virtualization?	CO1	(06)

UNIT-II

3.	a)	An Oracle database uses a block size of 4 KB for its I/O operation. The application that uses this database primarily performs a sequential read operation. Suggest and explain the appropriate values for the following cache parameters: cache page size, cache allocation (read versus write), prefetch type, and write aside size.	CO2	(06)
	b)	Describe the methods to expand LUNs that require additional capacity or performance.	CO2	(07)
	c)	Explain various types of flushing used to flush dirty pages when cache fills for managing space availability.	CO2	(07)
4.	a)	Which application benefits the most by bypassing the write cache and Why?	CO2	(05)

	b)	An application has 1,000 heavy users at a peak of 2 IOPS each and 2,000 typical users at a peak of 1 IOPS each, with a read/write ratio of 2: 1. It is estimated that the application also experiences an overhead of 20 percent for other workloads. Calculate the IOPS requirement for RAID 1, RAID 3, RAID 5, and RAID 6.	CO2	(10)
	c)	Discus the design of active-passive arrays to address enterprise applications.	CO2	(05)
		UNIT-III		
5.	a)	Illustrates the FC SAN evolution from FC-AL to enterprise SANs.	CO3	(07)
	b)	Compared to a standard IP packet, what percentage of reduction can berealized in protocol overhead in an iSCSI, configured to use jumbo frameswith an MTU value of 9,000 bytes? Justify why should an MTU value of at least 2,500 bytes be configured ina bridged iSCSI environment?	CO3	(06)
	c)	Explain the FCIP protocol stack with FCIP layer encapsulation of the Fibre Channel frames onto the IP payload?	CO3	(07)
6.	a)	Discus the types of ports in a switched fabric with the neat diagram.	CO3	(06)
	b)	Justify that the lossy nature of standard Ethernet make it unsuitable for alayered FCoE implementation. How does Converged Enhanced Ethernet(CEE) address this problem?	CO3	(06)
	c)	Compare and contrast three FC classes of services andtheir features.	CO3	(08)
		UNIT-IV		
7.	a)	Illustrates a file-serving environment before and after the implementation of file-level virtualization.	CO4	(06)
	b)	When is unified storage a suitable option for a data center? Justify your answer by comparing the unified storage offering with traditional storage solutions.	CO4	(06)
	c)	Compare the benefits of Network-attached storage with General purpose server.	CO4	(08)
8.	a)	How does the use of jumbo frames affect the NAS performance?	CO4	(05)
	b)	Discuss common NAS implementations.	CO4	(09)
	c)	Compare Block-level access versus object-level access.	CO4	(06)
		UNIT-V		
9.	a)	Explain the set of tasks involved in business impact analysis.	CO5	(08)
	b)	Illustrates the example for importance of monitoring security in a storage array with neat diagram.	CO5	(05)
	c)	A storage array dials a support center automatically whenever an error isdetected. The vendor's representative at the support center can log on tothe service processor of the storage array through the Internet to performdiagnostics and repair. Discuss the security concerns in this environmentand provide security methods that can be implemented to mitigate anymalicious attacks through this gateway.	CO5	(07)
10.	a)	Explain the implementation of intra-array storage tiering.	CO5	(07)
	b)	A system has three components and requires all three to be operational during 8 a.m. to 5 p.m. business hours, Monday through Friday. Failure of component 2 occurs as follows: • Monday = 8 a.m. to 11 a.m.	CO5	(07)

- Tuesday = No failure
- Wednesday = 4 p.m. to 7 p.m.
- Thursday = 5 p.m. to 8 p.m.
- Friday = 1 p.m. to 2 p.m.

Calculate the MTBF, MTTR and availability of component 2.

c) Explain the challenges faced by the cloud service consumers and providers in growing acceptance of cloud computing. CO5 (06)

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