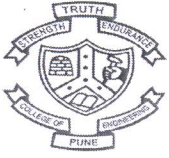## COLLEGE OF ENGINEERING, PUNE

(An Autonomous Institute of Government of Maharashtra.)

SHIVAJI NAGAR, PUNE - 411 005

End Semester Examination(CT-DE-14002)

Storage and Virtualization

Course:B. Tech.   Branch:Information Technology-Computer Engg
Semester: VII
Year:2014-15   Max. Marks: 60
Duration:3 hrs Time :2:00-5:00 p.m   Date: 28/11/2014

Instructions:
1. Figures to the right indicate the full marks.
2. Mobile phones and programmable calculators are strictly prohibited.
3. Writing anything on question paper is not allowed.
4. Exchange/Sharing of any things like stationery, calculator is not allowed.
5. Assume suitable data if necessary.
6. Write your MIS Number on Question Paper

Q1 a)	Explain in detail iSCSI Node?	3m
b)	What is DAS? list its advantage and disadvantages?	3m
c)	Differentiate between hardware and software failures.	2m
d)	Draw a pictorial representation of sample HA configuration with redundancy.	2m
Q2	What is Memory Management?Provide description of following memory management concepts.	10m

    a. Page

    b. Page fault

    c. Thrashing

    d. page replacement algorithms

Q3 a)	What is a device driver? How are they different from standard linux applications ?	6m

b) Can device driver be built separately from rest of kernel? What is the linux CLI   4 m
to load/unload a device driver?

Q4   1. Which is/are the key metrics used to measure storage performance.   10m

a. Capacity in GB

b. MBps

c. Latency in ms

d. Block size

2. Storage level virtualization in a SAN fabric can be implemented by having virtualization engine running in

a. HBA

b. FC switch

c. Raid array

d. Storage Controller

3. Which component of a disk drive is used for the physical storage of data blocks?

a. Cylinder

b. Head

c. Track

d. Sector

4. Which RAID technology provides max capacity utilization

a. RAID 0

b. RAID 1

c. RAID 5

d. RAID 6

5. Which of the following is false?

a. Almost all storage devices talk using SCSI commands and responses.

b. SCSI is vender neutral , managed by an independent body.

c. SCSI command is independent of underlying transports like iSCSI, FCP, etc.

d. None of the above

6. What is the approximate maximum potential bandwidth of a fibre channel (Full Duplex) 2Gb/s Link?

a. 100 MB/s

b. 200 MB/s

c. 212 MB/s

d. 400 MB/s

7. Which two statements are typically true for low end DAS storage? (Choose two)

a. Storage is not easily shared between servers

b. DAS storage is the most expensive to purchase

c. Storage devices must be located close to servers

d. Requires specialized training to manage

8. Which architectures are focused on block-level data transfer?(Choose two)

a. DAS

b. NAS

c. SAN

d. DAFS

9. What are benefits of a SAN? (Choose two)

a. Heterogeneous servers can share storage subsystems

b. Heterogeneous servers can share files

c. Storage subsystems can appear as self contained autonomous file servers

d. Servers and Storage can be managed centrally

10. Name two key applications enabled by Storage Networking? (Choose two)

a. Storage Consolidation

b. SAN Free Backup

c. LAN Free Backup

d. Server Consolidation

Q5 a) What are the different techniques of snapshots, explain with use cases.   4 m

b) What is data replication? Explain its significance with example. How it is   6 m
achieved ?

Q6 a) Explain data consistency with an example.Explain different states of transaction.   5 m

b) What is write order fidelity, how it is achieved.   5 m