Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2022

Course: Storage Technology Foundations **Semester: V1**
Program: B.Tech Computer Science+LLB CL/ET-IPR **Time : 03 hrs.**
Course Code: CSEG2012 **Max. Marks: 100**

Instructions: Attempt all the questions.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Explain difference between data and information. Write short note on structured, non-structured and semi-structured data.	**4**	**CO1**
Q 2	What is cache mapping and cache management? Explain two cache page replacement algorithm.	**4**	**CO2**
Q 3	Explain the need and evolution of data storage. Also discuss the importance of data for a business.	**4**	**CO1**
Q 4	List and explain Big data characteristics and challenges.	**4**	**CO5**
Q 5	Explain the CIA security model in Storage framework.	**4**	**CO5**

SECTION B
(4Qx10M= 40 Marks)

Q 6	i. What are the core elements of a Data Center? Explain in brief with diagram. ii. Explain the key characteristics a data center must have for its successful operation. What is a single point failure?	**5 + 5**	**CO4**
Q 7	i. Describe and distinguish between synchronous and asynchronous remote replication modes with diagram and the steps involved. ii. What is the difference between data backup and archival? Explain different data backup granularities.	**5 + 5**	**CO4**

Q 8	i. What are the disk drive components? Define the following terms a. I/O response time b. Arrival and processing rates c. Flash drives ii. An application specifies a requirement of 400 GB to host a database and other files. It also specifies that the storage environment should support 3,000 IOPS during its peak workloads. The disks available for configuration provide 50 GB of usable capacity, and the manufacturer specifies that they can support a maximum of 140 IOPS. The application is response time- sensitive, and disk utilization beyond 60 percent does not meet the response time requirements. Compute and explain the theoretical basis for the minimum number of disks that should be configured to meet the requirements of the application.	**5 + 5**	**CO1**
Q 9	Explain NAS with diagram. List it's components, advantages and limitations.	**10**	**CO3**
SECTION-C (2Qx20M=40 Marks)			
Q 10	i. Explain the growing need of cloud computing. What are different cloud service models? ii. Write a short note on IP-SAN and explain the IP-SAN storage deployment models.	**10+10**	**CO5, CO3**
Q 11	i. Consider a sequence of page references: 4, 7, 6, 1, 7, 6, 1, 2, 7, 2. Given that the number of frames in the memory is 3. Find out the number of page faults respective to: • Optimal Page Replacement Algorithm • FIFO Page Replacement Algorithm ii. With the help of diagrams, describe the following RAID technologies: striping, mirroring, and parity.	**10+10**	**CO2**