JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-3 EXAMINATION-2025

B.Tech-7th Semester (CSE/IT)

MAX. MARKS: 35

COURSE CODE (CREDITS): 18B1WCI736(3)

MAX. TIME: 2 Hours

COURSE NAME: Storage Networks

COURSE INSTRUCTORS: Dr Pankaj Dhiman, Mr. Akshay Kumar

Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	CO	Marks
Q1	A hospital stores patient records, medical images, reports, and backup copies across multiple storage devices without proper organization. Over time, data retrieval becomes slow and storage costs increase. Identify the problems caused by data proliferation in this scenario and suggest suitable storage management solutions.	1	5
Q2	A mid-size enterprise uses server-centric storage where each server has its own attached disks. As the number of servers increases, storage utilization becomes inefficient and data availability is affected. Explain how moving to a storage-centric IT architecture using a SAN solves these problems. Mention at least two advantages.	2	5
Q3	A database server requires high performance and fault tolerance. The system is configured using RAID 10 with 8 disks, each of 1.5 TB capacity. a. Calculate the total usable storage capacity. b. Determine the maximum number of disks that can fail without data loss, assuming failures occur in different mirror pairs. c. Calculate the storage efficiency (%) of this RAID configuration.	2	5
Q4	Several protocols exist for transporting storage traffic over IP networks. Compare iSCSI, iFCP, and FCIP with respect to protocol architecture, functionality, and deployment scenarios. Explain how these protocols support migration and extension of Fibre Channel SANs.	3	5

JUIT TEST-3 Examination Dec 2025

Q5	In a Storage Area Network, all application data and control information pass through a single virtualization entity. Identify the virtualization approach used and discuss one major performance concern associated with it.	4	5
Q6	An organization stores 500 GB of backup data every day for 10 days, resulting in a total of 5 TB of logical data. After applying block-level data deduplication, only 400 GB of unique data is stored on disk. Calculate the space reduction ratio achieved due to deduplication. Determine the percentage of storage space saved. Briefly comment on how de-duplication improves storage efficiency in this case	5	5
Q7	An enterprise data center needs to connect mainframe servers to remote storage systems located several kilometers away while ensuring high data integrity and minimal signal degradation. Traditional parallel I/O architecture fails to meet these requirements due to distance and cabling limitations. Explain the ESCON architecture and analyze how its design enables reliable long-distance storage communication, highlighting the architectural features that overcome the limitations of parallel I/O systems.	6	5

JUIT TEST-3 Examination Dec 2025