JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Supplementary Examination- 2026

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

COURSE CODE(CREDITS): 18B1WCI736 (3) MAX. MARKS: 75

COURSE NAME: STORAGE NETWORKS

COURSE INSTRUCTORS: Dr Pankaj Dhiman, Mr. Akshay MAX. TIME: 2 Hours

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	Explain how data proliferation impacts storage performance, cost, and security. Propose architectural strategies to control uncontrolled data growth	1	8
Q2	Explain the internal architecture of an Intelligent Disk Subsystem and analyze how intelligence at the disk controller level improves fault tolerance	2	9
Q3	Discuss the role of metadata in modern storage systems and its impact on performance and scalability	4	8
Q4	An organization deploys a RAID-6 array consisting of ten disks, each of 2 TB capacity. Calculate the usable storage capacity of the array and determine how many disk failures the system can tolerate without data loss. Explain why RAID-6 is preferred over RAID-5 for large storage systems.	2	8
Q5	Compare file-level locking in NAS with block-level locking in SAN and its implications for multi-host access	3	6
Q6	Explain how virtualization abstracts physical storage heterogeneity while maintaining performance guarantees	5	5
Q7	Analyze the trade-offs between strong consistency and eventual consistency in distributed storage architectures.	6	6
Q8	A Fibre Channel SAN link operates at a speed of 16 Gbps. Calculate the maximum theoretical throughput in MB/s. If the effective efficiency of the SAN is only 80%, determine the actual usable throughput and explain the factors responsible for bandwidth loss.	3	8
Q9	Explain the objectives of storage network management and discuss how effective management improves availability, performance, and reliability in enterprise storage environments.	6	9
Q10	Why does asymmetric virtualization create dependency on metadata services? Analyze failure scenarios.	5	8