JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Supplementary Examination- 2026

B.Tech-V Semester (CSE/IT)

COURSE CODE(CREDITS): 20B1WCI532 (02)   MAX. MARKS: 75

COURSE NAME: CLOUD COMPUTING: CONCEPTS, TECHNOLOGY & ARCHITECTURE

COURSE INSTRUCTORS: PKG, NKR, VNS   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	a) Differentiate between elasticity and scalability in cloud environments. b) What is an Amazon Machine Image (AMI)? c) State the purpose of security groups in AWS. d) What is resource pooling in cloud computing? e) Define load balancing and mention one algorithm used for load distribution.	CO1	2x5=10
Q2	Describe the end-to-end architecture of a scalable cloud-based web application. Explain how load balancing, auto-scaling, and resource pooling work together.	CO2	5
Q3	A company wants to run AI/ML workloads on the cloud. Evaluate the trade-offs between IaaS, PaaS, and SaaS in terms of cost, performance, and customization.	CO2	10
Q4	Write the Map and Reduce pseudocode to compute the average of a set of integers using MapReduce.	CO4	10
Q5	An HDFS cluster uses a block size of 128 MB. Three files of sizes 64 MB, 256 MB, and 300 MB are stored in HDFS. a) Calculate the number of HDFS blocks created for each file. b) Find the total number of blocks stored in HDFS. c) If the replication factor is 3, how many total block replicas will be created?	CO4	10
Q6	A cloud application runs on 6 identical servers, each capable of processing 250 requests/sec. a) Calculate the maximum system throughput. b) If workload increases to 1,600 requests/sec, determine whether the system can handle the load.	CO3	10

Q7	A development team launches EC2 instances with SSH access open to the public internet. Later, suspicious login attempts are detected. **Questions:** a) Identify the security risks in this setup. b) How should security group rules be modified? c) What additional AWS services can improve access security?	CO3	10
Q8	A company notices a sudden increase in monthly cloud bills without a corresponding increase in users. **Questions:** a) Identify possible reasons for cost escalation. b) How can monitoring and tagging help control costs? c) Suggest cost-optimization techniques.	CO2	10