JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2025

Ph.D. 1st Semester (CSE/ BT/BI)

COURSE CODE (CREDITS): 20P11EC111 (3) MAX. MARKS: 35

COURSE NAME: IOT and Applications

COURSE INSTRUCTORS: Dr. Vivek Kumar Sehgal 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	What are the major challenges identified in managing data and resources at the edge, especially for large-scale, latency-sensitive IoT applications like smart cities or disaster management systems?	CO-2,3	5
Q2	In what ways do existing commercial middleware platforms differ in terms of resource discovery, data ingestion, workflow orchestration, and programming models?	CO-3	5
Q3	Why is energy management considered a critical future research area for edge computing, and what limitations in current systems prevent efficient energy-aware computation scheduling?	CO-3	5
Q4	How can advances in AI at the edge, data synchronization mechanisms (e.g., CRDTs), and adaptive topologies improve the performance, resilience, and scalability of next-generation IoT systems?	CO-3,4	5
Q5	What fundamental limitations of cloud-centric architectures motivated the shift toward edge computing in IoT systems? [Only for CSE] How do feedback mechanisms influence the stability and behaviour of biological or computational systems? [Only for BI/BT]	CO-4	5
Q6	How does edge middleware act as an intermediary layer between heterogeneous IoT devices and high-level applications? [Only for CSE] What is the conceptual difference between centralized and distributed decision-making in intelligent systems? [Only for BI/BT]	CO-4,5	5
Q7	Why are latency, mobility, and context-awareness considered essential design considerations for modern IoT platforms? [Only for CSE] How does data representation affect the efficiency and accuracy of information processing in any system? [Only for BI/BT]	CO-5	5