

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2025

PhD-II Semester (ECE)

COURSE CODE (CREDITS): 20P11EC111 (3)

MAX. MARKS: 35

COURSE NAME: IOT AND APPLICATIONS

COURSE INSTRUCTORS: Dr. Alok Kumar

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	Describe duty cycling and its role in energy-efficient IoT communication. How do TDMA and CSMA impact energy usage in IoT networks?	1	4
Q2	What is Zigbee? Explain its architecture and role in IoT communication. Compare Zigbee and Bluetooth in terms of range, data rate, and power usage.	2	5
Q3	Why is Message Queuing Telemetry Transport (MQTT) considered lightweight and suitable for IoT? Explain how MQTT is used in a smart agriculture or remote monitoring application.	5	4
Q4	Design an IoT system for a smart home using Zigbee and Bluetooth. How would you ensure interoperability?	1	4
Q5	What is the difference between analog and digital sensors? Give two examples of each. What is the role of the ADC (Analog-to-Digital Converter) in Arduino?	4	4
Q6	Draw and explain the architecture of an SDN-based IoT system. Discuss the steps involved in implementing SDN in an IoT network. What are the challenges of integrating SDN with IoT devices?	2	5
Q7	Describe how Open Daylight can be used to implement dynamic routing in a software-defined environment.	3	4
Q8	What is a smart home? List the major components used in smart home automation. Explain how IoT is used to implement smart home security.	5	5