JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2025

PhD-II Semester (ECE)

COURSE CODE (CREDITS): 20P11EC111 (3) MAX. MARKS: 15

COURSE NAME: IOT AND APPLICATIONS

COURSE INSTRUCTORS: Dr. Alok Kumar MAX. TIME: 1 Hour

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 the classification of IoT sensors based on the type of data they collect, with relevant examples.	CO1	3
Q2	Compare and contrast electric, pneumatic, and hydraulic actuators in terms of working principle, applications, and advantages.	CO1	3
Q3	Illustrate the architecture of 6LoWPAN and how it integrates with IPv6? A standard IPv6 packet is 1280 bytes long, but 6LoWPAN uses fragmentation to fit within an IEEE 802.15.4 frame, which has a maximum payload size of 127 bytes. a) How many fragments are required to transmit a full IPv6 packet over 6LoWPAN? b) If each fragment has a 5-byte fragmentation header, what is the total overhead added?	CO2	4
Q4	What is MQTT, and why is it used in IoT applications? Explain the publish-subscribe model of MQTT. If a device sends 500 messages per hour, how much data (in KB) is transmitted in 24 hours?	CO2	3
Q5	Draw the architecture of an IoT system with a neat diagram, highlighting its main components.	CO2	2