10/9/25 11:30 AM

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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2025

IT (Minor)-VII Semester (BT/BI)

COURSE CODE (CREDITS): 25BI WOCI731 (2) MAX. MARKS: 15

COURSE NAME: Building IoT and Network Applications

COURSE INSTRUCTORS: Sandeep Kumar Patel 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	A company wants to deploy an IoT-based smart agriculture system to monitor soil moisture, temperature, and crop health in a large farm. The system must automatically control irrigation pumps and send real-time updates to a mobile application used by farmers. a) Identify and describe the "Things" in this IoT setup (both physical and virtual). b) Draw and explain the generic block diagram for a single IoT node (thing) used in this farm. c) Suggest suitable sensors, actuators, communication technologies, and processing units for this application, with reasoning. d) Discuss two challenges that could arise in this IoT system in terms of scalability and reliability. How could they be mitigated?	1	1+1+1+1
Q2.	In an IoT system, link layer protocols determine how "things" connect and share data over the physical medium. a) Briefly explain the role of link layer protocols in IoT communication. b) Compare the functions of three commonly used link layer protocols in IoT in terms of range, power consumption, and suitability for different IoT applications. c) If you were designing a smart home system with many battery-powered sensors, which protocol would you choose and why?	1	1+1+1
Q3.	What are the main characteristics of IoT systems? Imagine you are designing an IoT-based traffic management system for a smart city. Which three characteristics would be most critical for this application? Justify your choice with reasoning.	1	1+2

Q4.	If a device has 4G connectivity, does it automatically qualify as an IoT device? What additional features are required for it to be considered part of the IoT ecosystem? Can you give one example?	1	2
Q5.	IoT systems use sensors and actuators to control appliances. a) How do sensors detect changes in the environment (e.g., motion or temperature)? b) What role do actuators play in responding to these sensor inputs? c) Give one real-life example from a smart home setup.	1	1+1+1