Reg. No. : | | | | | | | | | | | | |

Question Paper Code: R3I04

B.E./B.Tech. DEGREE EXAMINATION, NOV 2025

Third Semester

CSE (Internet of things)

R21UIO304-FUNDAMENTALS OF IOT

(Regulations R2021)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5Marks)

1. Which protocol standard is commonly used in WSN for communication? CO1-U

   (a) HTTP (b) Zigbee (c) Bluetooth (d) Ethernet

2. What is the peak downlink data rate offered by LTE Release 8 with 20 MHz bandwidth and 2 × 2 MIMO? CO1-App

   (a)150 Mbps (b) 100 Mbps (c) 250 Mbps (d) 200 Mbps

3. What is the primary function of the OIC Bridge? CO1-U

   (a) To connect OIC devices to the internet

   (b) To represent non-OIC devices as OIC devices

   (c) To provide cloud storage

   (d) To manage device security

4. Which of the following is NOT one of the four pillars of IoT? CO1-U

   (a) RFID (b) Sensor Networks (c) SCADA (d) Block chain

5. What is Industry 4.0? CO1-U

   (a) A new type of manufacturing process

   (b) The fourth industrial revolution involving smart technologies

   (c) A software development methodology

   (d) All types of IOT devices

PART – B (5 x 3= 15 Marks)

6.	Organize the M2M Ecosystem components in centralized air conditioning system	CO1-App	
7.	Differentiate between Bluetooth Low Energy (BLE) and Zigbee protocols in terms of power consumption.	CO1-U	
8.	Using a bargaining-based approach inspired by game theory, allocate network resources to optimize overall Quality of Service (QoS).	CO2-App	
9.	List out the application of WoT applications and how do they contribute to their respective fields?	CO1-U	
10.	Propose a method to use IoT to enhance worker safety in industrial environments and explain how it would work..	CO2-App	

PART – C (5 x 16= 80 Marks)

11.	(a)	Describe how the environment can be more protected with the help of IoT technology in the following categories: (i) Air pollution monitoring (ii) Noise pollution monitoring (iii) Forest fire detection (iv) River flood detection	CO2-App	(16)
		Or		
	(b)	With the help of following sectors explain how IoT technology is impacting on the end-to-end value chain in the logistics sector: (i) Route generation & scheduling (ii) Fleet tracking (iii) Shipment monitoring (iv) Remote vehicle diagnostics	CO2-App	(16)
12.	(a)	Draw neat sketch of IoT reference model and list out various functions of the Layers	CO1-U	(16)
		Or		
	(b)	Discuss the Various Communication topologies in Zigbee with neat diagram	CO1-U	(16)
13.	(a)	Explain briefly about open interconnect consortium security specification for end-to-end device protection	CO1-U	(16)
		Or		
	(b)	Describe processing off loading and outline the different layers involved in an IoT deployment.	CO1-U	(16)

14.	(a)	Explain how OGC Sensor Web Enablement (SWE) standards support web-connected sensors and describe the main components and functions of the Ubiquitous Sensor Networks (USN) framework.	CO1-U	(16)
		Or		
	(b)	Describe the security challenges faced in IoT information security.	CO1-U	(16)
15.	(a)	Choose the best approach to develop a smart application for predictive maintenance in an industrial setting. Identify the IoT components and the data collection process, and explain how predictive analytics would prevent equipment failures.	CO2-App	(16)
		Or		
	(b)	In implementing IoT applications for a smart city, how would you address technical, institutional, and economic challenges? Outline your strategies for overcoming these challenges	CO2-App	(16)