C **Reg. No. :** [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

Question Paper Code: R5403

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

Fifth Semester

Electronics and Communication Engineering

R21UEC503- INTERNET OF THINGS AND APPLICATIONS

(Regulations R2021)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 5 = 50 Marks)

1.	How does the Internet of Things (IoT) affect our everyday lives?	CO1-U
2.	Explain how M2M is different from IoT with suitable example.	CO1-U
3.	Explain How MQTT is Different From COAP.	CO1-U
4.	Interpret the constraints of the REST Architecture.	CO1-U
5.	Explain the implementation of IoT technology in Smart roads and cities.	CO1-U
6.	Explain how the WebSocket API facilitates real-time data communication in a weather monitoring IoT system. Why is it preferred over traditional HTTP in this context?	CO1-U
7.	Provide a JSON representation for employee registration in Restful service.	CO2-App
8.	Demonstrate how you would use the WebSocket API to stream temperature and humidity data from a sensor node to a live dashboard in a weather monitoring IoT system.	CO2-App
9.	Air Quality and the monitoring of pollutants that can cause health issues is becoming more important to our daily lives with governments and regulators keen to both monitor and manage the impacts of poor air quality caused by a range of pollutants. Provide a solution to resolve the issues mentioned in this scenario.	CO2-App
10.	How would you implement IoT applications in a supply chain system to improve goods tracking, streamline shipment operations, and ensure transparent information exchange with stakeholders? Also, explain how this implementation can reduce manpower and increase cost-effectiveness and automation.	CO3-App

PART – B (5 x 10= 50 Marks)

11. (a) Explain the different levels of IoT and illustrate each level with a simple diagram. Provide an example to show how each level functions in a real-world scenario.   CO1-U   (10)

Or

(b) List the different layers of IoT architecture and explain how each layer functions when integrating cutting-edge technologies in a real-world project.   CO1-U   (10)

12. (a) An MNC has an employment service that follows a set of rules to obtain and enter candidate information into EMS. Suggest which constrained application protocol is suitable for this particular application, and illustrate the data flow using a neat labeled diagram   CO2-App   (10)

Or

(b) The growing number of elderly people demands an efficient healthcare system. Advanced Information and Communication Technologies (ICT) techniques support elderly monitoring services at a high cost. Propose an IoT-based solution using MQTT protocol for the monitoring of elderly people. In your proposed solution, heterogeneous devices (belonging to elderly people under observation) must be able to:
A. Collects environmental and physical user data.
B. Share data with each other and
C. Send social interaction data to respective physicians and caregivers.   CO2-App   (10)

13. (a) Develop a Remote Patient Monitoring system to improve medical staff performance, avoid routine visits and increase the quality of care.   CO5-App   (10)

Or

(b) Design an IoT set up for identifying vacant spaces and slot IDs using ultrasonic pulses and back reflections to the transceiver (emitter and sensors) at the coordinator.   CO5-App   (10)

14. (a) A farmer uses an API to visualize the moisture data in his farming land. A non-confirmable request has been sent to the CoAP server. He then posts the motor's status as "ON" using confirmable request and, an hour later, uses a confirmable request to get the water level's status. Show the diagram depicts the above process and discuss it.   CO2-App   (10)

Or

(b) Provide an IoT solution for smart parking and illustrate the design.   CO2-App   (10)

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15. (a) Illustrate how you would set up an IoT-based health monitoring system CO4-App (10) to continuously track patient vitals and send alert notifications to caregivers in case of abnormal readings.

Or

(b) Design a cloud service model to monitor fill levels and optimize CO4-App (10) collection routes for waste container management using IoT.

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