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PRESIDENCY UNIVERSITY BENGALURU

Department of Research & Development

Mid - Term Examinations - AUGUST 2024

Odd Semester: Ph.D. Course Work

Course Code: CSE897

Course Name: Introduction to Internet of Things

Department: CSE

Date: 13-08-2024

Time: 09.30am to 11.00am

Max Marks: 50

Weightage: 25%

Instructions:

- (i) Read the all questions carefully and answer accordingly.
 - (ii) Do not write any matter on the question paper other than roll number.
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PART A (THOUGHT PROVOKING)

Answer all the Questions. Each question carries 5 marks.

(4Qx 5M= 20M)

1. Explain the various Characteristics of IOT. (CO1, Understand)
2. Write short notes on IOT infrastructures? (CO1, Remember)
3. Explain IOT Protocol architecture? (CO2, Understand)
4. Briefly discuss about Zigbee. (CO2, Remember)

PART B (PROBLEM SOLVING)

Answer all the Questions. Each question carries 10 marks.

(3Qx 10M= 30M)

5. You have been given the IP address 192.168.10.0/24. You need to create 4 subnets from this address. What will be the subnet mask for each subnet, and what are the network addresses for each of the 4 subnets? Explain in detail. (CO1, Apply)
6. A city is implementing a smart traffic management system to reduce congestion and improve safety. The system uses IOT sensors at traffic lights, cameras at intersections, and connected vehicles to gather real-time data on traffic flow, vehicle speeds, and accidents. The city

currently sends all data to a centralized cloud server for analysis, but experiences delays due to network congestion, impacting real-time decision-making and response times. The city is considering deploying edge computing to enhance the system's performance.

Questions:

1. How can edge computing improve the smart traffic management system?
2. What challenges might the city face in implementing edge computing?

(CO1, Apply)

7. A logistics company uses IoT devices to monitor the conditions of goods during transportation. These IoT devices, placed in shipping containers, measure parameters such as temperature, humidity, and GPS location. The devices need to send data periodically to a central monitoring system via MQTT. The company wants to ensure the data is reliable and secure, especially when the containers are in remote areas with intermittent connectivity.

Questions:

1. How can MQTT's features be utilized to ensure reliable data transmission in areas with intermittent connectivity?
2. What are the key security considerations for transmitting sensitive data (e.g., shipment details, location) via MQTT, and how can these be addressed?

(CO2, Apply)