

Roll No.

67192-N

**MCA 4th Semester 2 yr. Course
Examination – December, 2024**

IOT & SENSOR NETWORKS

Paper : 21MCA24C2

Time : Three Hours] [Maximum Marks : 80

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all by selecting *one* question from each Unit and Question No. 1 which is ***compulsory***.

1. (a) Define the term "sensor node" in the context of WSNs. $2 \times 8 = 16$
 - (b) How does geographic routing differ from traditional routing in WSNs ?
 - (c) Differentiate IoT privacy and security ?
 - (d) What is the primary purpose of deploying Wireless Sensor Networks ?

- (e) How does the "sink node" differ from regular sensor nodes in a WSN?
- (f) What is layered attacker model?
- (g) What is Nimbits?
- (h) What are vulnerabilities in an IoT environment?

UNIT - I

2. (a) What is IoT? How did it evolve? What are the key components of an IoT/M2M system and how they work together? Illustrate. 8
- (b) How is IP addressing handled in the Internet of Things (IoT)? What challenges does IoT pose for traditional IP addressing schemes? Explain. 8
3. (a) What is the modified OSI model for IoT/M2M system? Discuss the functions and requirements of each layer. 8
- (b) What is LoWPAN? What are the key features of LoWPAN? How does it enable communication among low-power devices in the context of the Internet of Things (IoT)? Explain. 8

UNIT - II

4. (a) What is Arduino? What are the capabilities of Arduino IDE? How it is used for developing IoT projects? Discuss. 8
- (b) What do you mean by IoT security tomography? How is it significant? Illustrate its relevance. 8

5. (a) How does the cloud computing paradigm enhance data collection and storage capabilities, especially in the context of large-scale IoT deployments ? Explain. 8
- (b) How does Nimbits contribute to cloud-based data collection, storage, and computing services for IoT applications ? Explain. 8

UNIT – III

6. What are Wireless Sensor Networks ? What are the key components and communication principles that form the foundation of Wireless Sensor Networks ? What are the major challenges faced by Wireless Sensor Networks ? Explain. 16
7. (a) What role do sensors, microcontrollers, and communication modules play in the design of a sensor node ? How are they interconnected to achieve specific sensing and communication tasks ? Explain. 8
- (b) What are the design principles employed in architecting WSNs for optimal performance, scalability, and adaptability to dynamic environmental conditions ? Illustrate. 8

UNIT – IV

8. (a) What are the key considerations in the design of the physical layer and transceivers for Wireless Sensor Networks, particularly in terms of energy efficiency and communication range ? Explain. 8
- (b) How do contention-based and contention-free MAC protocols address the challenges of channel access and energy conservation in WSNs ? Explain. 8
9. (a) How does efficient address management contribute to network scalability and resource optimization ? Explain. 8
- (b) What role do addressing schemes play in the efficient routing and data forwarding within Wireless Sensor Networks ? Explain. 8
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