

Roll No.

67192-N

**MCA 4th Semester 2yr. Course
Examination – July, 2022**

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, selecting at least **one** question from each Unit. Question No. 1 is **compulsory**. All questions carry equal marks.

1. (a) How can IoT help in building smart homes ?
- (b) Define an Embedded System.
- (c) Write the full form of MQTT.
- (d) What is the job of a proximity sensor ?
- (e) How is WSN different from IoT ?
- (f) Why is tomography used ?
- (g) Write two issues related to multi-hop networks.

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(h) What changes in addressing system were made for WSN ? $2 \times 8 = 16$

UNIT - I

2. Define IoT. Describe three conceptual frameworks and their equations. Write the steps/features required at various layers in IoT application. 16

3. (a) What is M2M communication ? Compare and contrast COAPMQ and MQTT protocols. 10

(b) Explain the features of 6LoWPAN protocol. Justify the need of IPv6 for IoT. 6

UNIT - II

4. (a) What software components are required for connecting sensors and actuators to the Internet ? Elaborate at least five features of an Arduino board. How is it different from Intel Galileo ? 10

(b) List the merits and demerits of various cloud deployment models. 6

5. (a) What is a MCU ? Explain on-chip functional units of a Microcontroller and draw its diagram. 10

(b) What are the vulnerabilities and possible attack surfaces of an IoT application ? 6

UNIT - III

6. (a) Discuss the challenges for developing a Wireless Sensor Network. 10

(b) Critically evaluate the need for energy consumption in sensor networks along with various techniques to manage it. 6

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7. (a) Write a detailed note on enabling technologies for Wireless Sensor Networks. 10

(b) Define the terms : energy per correctly received bit, delay/energy trade-offs, time to failure of first event notification. 6

UNIT - IV

8. Write short notes on the following with appropriate diagrams : $4 \times 4 = 16$

(i) Low Duty Cycle Protocol

(ii) Organization of LEACH rounds

(iii) S-MAC principles

(iv) PAMAS

9. (a) Explain the energy problems on the MAC layer and corresponding design goals. 10

(b) Differentiate between strong DAD and weak DAD schemes used in address detection. What is the overhead associated with addressing ? 6

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