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Printed Page:-4 **Subject Code:-AMICA0703**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)
MCA Integrated
SEM: VII - THEORY EXAMINATION (2025 - 2026)
Subject: Internet of Things

Time: 3 Hours **Max. Marks: 100**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*
1. *This Question paper comprises of* ***three Sections -A, B, & C.*** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*
2. *Maximum marks for each question are indicated on right -hand side of each question.*
3. *Illustrate your answers with neat sketches wherever necessary.*
4. *Assume suitable data if necessary.*
5. *Preferably, write the answers in sequential order.*
6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION-A 20

1. Attempt all parts:-

1-a. Which of the following is NOT a layer of IoT architecture? (CO1,K1) 1

(a) Perception Layer
(b) Network Layer
(c) Application Layer
(d) Execution Layer

1-b. M2M communication refers to: (CO1,K1) 1

(a) Human-device interaction
(b) Device-to-device communication
(c) Cloud-only exchange
(d) Manual configuration

1-c. Which of the following is NOT a sensor? (CO2,K1) 1

(a) Gyroscope
(b) Accelerometer
(c) Stepper Motor
(d) Ultrasonic sensor

1-d. In RFID, the reader is responsible for: (CO2,K2) 1

(a) Storing data
(b) Generating radio waves
(c) Moving objects
(d) Converting AC to DC

1-e. What is the clock speed of Arduino Uno? (CO3,K1) 1

(a) 8 MHz
(b) 16 MHz
(c) 20 MHz
(d) 32 MHz

1-f. To add two integers in Arduino IDE, which operator is used? (CO3,K1) 1

(a) +
(b) -
(c) *
(d) %

1-g. Which OSI layers correspond to PHY and MAC in IoT networks? (CO4,K1) 1

(a) Layer 1 & 2
(b) Layer 3 & 4
(c) Layer 5 & 6
(d) Layer 7

1-h. BLE operates in which frequency band? (CO4,K1) 1

(a) 900 MHz
(b) 2.4 GHz
(c) 5 GHz
(d) 60 GHz

1-i. Which sensor is commonly used in wearable health devices?(CO5,K2) 1

(a) ECG sensor
(b) LDR
(c) IR proximity sensor
(d) PIR

1-j. Analyze the main challenge in e-health IoT systems.(CO5,K4) 1

(a) Low latency
(b) Data privacy & security
(c) Extra storage
(d) Simple cabling

2. Attempt all parts:-

2.a. Evaluate the effectiveness of XaaS (Everything as a Service) in IoT business models. (CO1,K4) 2

2.b. Explain the difference between a sensor and a transducer. (CO2,K2) 2

2.c. Write the purpose of the setup() and loop() functions in Arduino IDE. (CO3,K1) 2

2.d. Explain the difference between PHY and MAC layers in IoT communication. (CO4,K2) 2

2.e. Analyze the benefit of using real-time data in smart energy billing. (CO5,K4) 2

SECTION-B 30

3. Attempt all parts:-

3.a. Answer any one of the following:-

3.a.(i)	Illustrate the role of IoT gateways in connecting devices to cloud platforms. (CO1,K3)	6
3.a.(ii)	How can we improve the way IoT-enabled e-commerce platforms collect, store, and use information so that decisions become faster and smarter? (CO1,K2)	6
3.b. Answer any one of the following:-		
3.b.(i)	Explain the working principles of different types of sensors with examples. (CO2,K2)	6
3.b.(ii)	How does RFID technology support supply chain and inventory management? (CO2,K3)	6
3.c. Answer any one of the following:-		
3.c.(i)	Differentiate between digital pins and analog pins in Arduino with suitable examples. (CO3,K2)	6
3.c.(ii)	Illustrate the process of writing, compiling, and uploading code using Arduino IDE. (CO3,K2)	6
3.d. Answer any one of the following:-		
3.d.(i)	Explain the role of PHY and MAC layers in IoT communication with examples. (CO4,K2)	6
3.d.(ii)	Apply the concept of BLE advertising and connection modes to a wearable health monitoring device. (CO4,K3)	6
3.e. Answer any one of the following:-		
3.e.(i)	Analyze the impact of IoT on reducing traffic congestion in smart cities. (CO5,K4)	6
3.e.(ii)	Evaluate the role of big data and IoT in improving city governance and citizen services. (CO5,K5)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Explain the role of business processes in IoT deployment with a real-world example. (CO1,K2)	10
4-b.	Discuss how knowledge management supports innovation and continuous improvement in IoT. (CO1,K2)	10

5. Answer any one of the following:-

5-a.	Describe the role of actuators in IoT with real-life applications. (CO2,K2)	10
5-b.	Compare active and passive RFID tags with advantages and limitations. (CO2,K3)	10

6. Answer any one of the following:-

6-a.	Differentiate between Arduino Uno, Mega, and Nano in terms of memory, pins, and applications. (CO3,K2)	10
6-b.	Write an Arduino program to perform arithmetic addition of two numbers and display the result on Serial Monitor. (CO3,K3)	10

7. Answer any one of the following:-

7-a.	Analyze the challenges of PHY layer design in low-power IoT devices. (CO4,K4)	10
7-b.	Apply BLE architecture to design a wearable health monitoring system. (CO4,K3)	10

8. Answer any one of the following:-

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8-a.	Evaluate the role of AI integration in enhancing smart home automation systems. (CO5,K5)	10
8-b.	Propose an IoT project where Raspberry Pi acts as a gateway between hardware sensors and mobile apps. (CO5,K6)	10