

Term End Examination January – 2026

Course	: MCA	Date	: 26/02/2026
Subject Code	: MCA-E3305	Time	: 03:00pm to 05:15pm
Subject	: Components and Applications of the Internet of Things	Duration	: 02.15 Hours
		Max. Marks	: 70

Section A

Answer the following (Attempt any three) (30)

1. Define Internet of Things (IoT). Explain the fundamental components of an IoT system (Sensors, Connectivity, Data Processing, and User Interface).
2. Describe the 4-layer or 7-layer IoT Architecture in detail. Explain the role of the Perception layer and Network layer.
3. Discuss the various Wireless Communication Protocols used in IoT, such as ZigBee, Bluetooth Low Energy (BLE), and LoRaWAN.
4. Explain the role of Cloud Computing in IoT. How do platforms like AWS IoT or Google Cloud IoT facilitate device management and data analytics?
5. What are the security challenges in IoT? Discuss various threats at the device, network, and application levels and suggest mitigation strategies.

Section B

Answer the following (Attempt any four) (20)

1. Explain the concept of "Smart Cities." How does IoT improve urban waste management and transportation?
2. Differentiate between Industrial IoT (IIoT) and Consumer IoT with suitable examples.
3. What is an IoT Gateway? Explain its importance in bridging the gap between sensors and the cloud.
4. Describe the working principle of an RFID system and its applications in supply chain management.
5. Discuss the ethical concerns regarding data privacy and informed consent in IoT-enabled healthcare devices.
6. Explain the role of Artificial Intelligence (AI) and Machine Learning in IoT decision-making processes.

Section C

Part – A (Multiple Choice Questions) (10)

- Which of the following is considered the "brain" of an IoT device?
A. Sensor
B. Microcontroller/Processor
C. Actuator
D. Battery
- MQTT is a _____ protocol used in IoT communication.
A. Request/Response
B. Publish/Subscribe
C. Peer-to-Peer
D. None of these
- Which technology is used for short-range wireless communication in IoT?
A. LoRa
B. ZigBee
C. Satellite
D. 5G
- The process of turning a physical property into an electrical signal is done by:
A. Actuator
B. Sensor
C. Inverter
D. Router

- 5 IPv6 is preferred for IoT over IPv4 because of:
A. Higher speed B. Larger address space
C. Lower cost D. Better hardware
- 6 Which layer in IoT is responsible for making sense of collected data?
A. Perception Layer B. Processing/Application Layer
C. Physical Layer D. Transport Layer
- 7 WSN stands for:
A. Wired Sensor Network B. Wireless Sensor Network
C. Wide System Network D. Web Service Node
- 8 Which device is used to perform a physical action (like closing a valve) based on IoT data?
A. Sensor B. Actuator
C. Capacitor D. Gateway
- 9 In a Smart Grid, IoT is primarily used for:
A. Entertainment B. Real-time monitoring of energy consumption
C. Increasing physical weight of wires D. None of these
- 10 Which protocol is specifically designed for low-power, wide-area networks (LPWAN)?
A. HTTP B. LoRaWAN
C. FTP D. SMTP

Part – B (Do as Directed)

(10)

State whether the following statements are true or false

- 1 IoT devices can only communicate with humans and not with other devices.
- 2 Edge Computing processes data closer to the source to reduce latency.
- 3 Security is not a major concern for IoT because the devices are small.
- 4 CoAP (Constrained Application Protocol) is a specialized web transfer protocol for use with constrained nodes.
- 5 A Smart Thermostat is an example of a Consumer IoT application.
- 6 Most IoT devices have unlimited power supply and memory.
- 7 Interoperability is a challenge when devices from different manufacturers need to work together.
- 8 Sensors are output devices that perform physical tasks.
- 9 Data encryption is a common method to secure IoT data transmission.
- 10 IoT has no impact on environmental sustainability.
