

MODULE I INTERNET OF THINGS CONCEPTS

Internet of Things (IoT) - Characteristics of IoT - IoT Vision – Emerging Trends in IoT - Economic Significance of IoT - Societal Benefits of IoT - Technical Building Blocks - High-level Architecture of IoT - Physical Design of IoT - Things in IoT - IoT Protocols (Interoperability of IoT Devices - Link Layer Protocols - Network Layer Protocols - Transport Layer Protocols – Application Layer Protocols.

2MARK

1. What is Internet of Things (IoT)?
2. Mention the application of IoT.
3. List the characteristics of IoT.
4. Mention any four emerging trends in IoT.
5. State the technical building block elements.
6. State the Benefits of IoT.
7. What is the Link layer in IoT?
8. What is the Network layer in IoT?
9. What is the Transport layer in IoT?
10. What is the application layer in IoT?

8MARK

1. Explain the vision of IoT and mention its impact on various industries.
2. Explain high-level architecture of IoT, state the key components and their interactions.
3. Explain the technical building block with a neat diagram.
4. Explain in detail about IoT Protocols with a neat diagram.
5. Describe the application layer protocols in IoT, including their functionalities and various IoT applications.

MODULE II SENSORS, ACTUATORS AND SMART OBJECTS

Sensors - Analog to Digital Conversion - Types of Sensors - Actuators - Types of Actuators - Smart Objects - Common Smart Objects (IoT Devices) - Home Automation - Industrial IoT - Personal and Health Care - Other Uses.

2MARK

1. What are sensors?
2. Mention the types of sensors.
3. What are actuators?
4. State the types of actuators.
5. What is a smart object?
6. List out smart objects.
7. Differentiate between industrial IoT and personal IoT.
8. Give an example of home automation.
9. Give an example of personal and health care.
10. What is meant by industrial IoT?

8MARK

1. Explain in detail about sensor and its type with neat diagram.
2. Explain the process of analog to digital conversion in IoT devices. Mention the significance of this conversion and its impact on data processing.
3. Describe the actuator and its types.
4. Illustrate the working principle of a solenoid actuator with a neat diagram.
5. Explain the components and communication protocols typically used in a smart object ecosystem.
6. Explain in detail about home automation.
7. Explain in detail about industrial IoT.
8. Illustrate the Personal and Health Care in IoT.
9. Describe the working principle of a Piezoelectric actuator with a relevant diagram.

MODULE III IOT COMMUNICATION MODELS AND APIs

Logical Design of IoT - IoT Functional Blocks - IoT Communication Models -

Request – Response Communication Model - Publish – Subscribe

Communication Model - Push – Pull Communication Model

2MARKS

1. What is logical design of IoT?
2. Define IoT functional blocks.
3. Define IoT communication models.

Scenario based question

Request-response communication model

1. In a smart healthcare system, a wearable device continuously monitors a patient's vital signs and sends requests for medical assistance in case of abnormal readings. Explain how the request-response communication model would be utilized in this scenario.

2. A smart home security system allows homeowners to remotely check camera feeds and control door locks through a mobile app. Discuss the implementation of the request-response communication model in this context, including potential security considerations.

Publish – Subscribe Communication Model

1. A smart grid system is designed to manage energy distribution across a city. Describe how the publish-subscribe communication model can be employed to facilitate real-time updates and coordination among various power generation and consumption units.

2. A fleet management company uses IoT devices installed in vehicles to track their location and performance. Explain how the publish-subscribe communication model enables efficient data distribution and event notification in this scenario.

Push-Pull Communication Model

1. A smart irrigation system adjusts watering schedules based on soil moisture levels measured by IoT sensors. Analyze how the push-pull communication model can

optimize data transmission between sensors and the central control unit in this scenario.

2. Assume that the scenario where the push-pull communication model is utilized in the smart home. Discuss the advantages of this model where real-time updates are not critical but data synchronization is necessary.