



SNS COLLEGE OF ENGINEERING

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AN AUTONOMOUS INSTITUTION

Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai
V Semester

B.Tech.-Artificial Intelligence and Data Science

19AD505 – Internet of Things and AI

UNIT III –QUESTION BANK -2 MARK

RFID: Introduction, Principle, and Components

1. **What is RFID?**
 - RFID (Radio Frequency Identification) is a technology used for automatic identification and data capture using radio waves to read and capture information stored on a tag attached to an object.
2. **What are the key components of an RFID system?**
 - The key components are:
 1. **RFID Tags** (active, passive, or semi-passive).
 2. **RFID Readers** that communicate with tags.
 3. **Antenna** to transmit signals.
3. **What is the working principle of RFID?**
 - RFID works by using electromagnetic fields to automatically identify and track tags attached to objects. The tag responds with its stored data when it comes within the range of an RFID reader.
4. **What is the difference between active and passive RFID tags?**
 - **Active tags** have their own power source, allowing longer communication ranges, while **passive tags** draw power from the RFID reader's signal and are cheaper but have shorter ranges.
5. **What frequency ranges are used in RFID systems?**
 - RFID operates in different frequency ranges:
 - Low Frequency (LF): 125-134 kHz.
 - High Frequency (HF): 13.56 MHz.
 - Ultra-High Frequency (UHF): 865-960 MHz.

RFID and NFC Protocols

1. **What is the difference between RFID and NFC?**
 - **RFID** is used for long-range identification, typically over several meters, while **NFC** is a short-range, high-frequency technology (up to 10 cm), often used for secure data transfer in applications like mobile payments.
2. **What protocol does NFC use?**
 - NFC uses protocols based on ISO/IEC 18092 and ISO/IEC 14443 standards.
3. **What is the function of the ISO/IEC 18000-6 protocol in RFID?**
 - ISO/IEC 18000-6 defines the air interface communication standard for RFID systems operating in the UHF frequency band (860-960 MHz), commonly used in supply chain management.
4. **What is the maximum communication range of NFC?**
 - The maximum communication range of NFC is around 10 cm.

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SWATHIRAMYA AP/AIDS

Wireless Sensor Networks (WSN)

1. **What is the architecture of a WSN?**
 - A WSN consists of sensor nodes, gateways, and a communication network, where sensor nodes collect data, gateways aggregate the data, and the network transmits it to a central system.
2. **What is a sensor node in a WSN?**
 - A sensor node is a small, low-power device in a WSN that gathers data from the environment and transmits it to other nodes or gateways.
3. **What is the purpose of networking nodes in a WSN?**
 - Networking nodes in a WSN collaborate to route data from the sensor nodes to the base station or central system, ensuring efficient communication in the network.
4. **What are some WSN-specific IoT applications?**
 - Examples include **smart agriculture**, **environmental monitoring**, **healthcare**, and **smart cities** where data from sensor networks is used to make decisions in real-time.
5. **What is one method of securing communication in WSN?**
 - One method is **encryption** of the data transmitted between nodes to prevent unauthorized access or eavesdropping.

IoT Protocols: CoAP, XMPP, AMQP, MQTT

1. **What is CoAP in IoT?**
 - CoAP (Constrained Application Protocol) is a web transfer protocol designed for constrained devices and networks, using UDP for lightweight communication.
2. **What is the primary use of XMPP in IoT?**
 - XMPP (Extensible Messaging and Presence Protocol) is used in IoT for **real-time communication** between devices, supporting instant messaging, presence, and data exchange.
3. **What is AMQP, and where is it used in IoT?**
 - AMQP (Advanced Message Queuing Protocol) is used in IoT for reliable message-oriented communication in environments requiring **message delivery guarantees**.
4. **What is the key feature of MQTT in IoT communication?**
 - MQTT (Message Queuing Telemetry Transport) is a lightweight protocol designed for IoT, enabling efficient, low-bandwidth, publish/subscribe messaging ideal for remote devices with limited connectivity.
5. **What type of communication model is used in MQTT?**
 - MQTT uses a **publish/subscribe model**, where devices can publish data to a central broker, and other devices can subscribe to receive specific data.
6. **What transport layer protocol does CoAP use?**
 - CoAP uses **UDP** for transport, ensuring lightweight communication suitable for constrained devices.

1. Define Operational View Specification.
2. Differentiate Arduino and Raspberry Pi.
3. What are the Components of an RFID system?
4. List out the applications of NFC.
5. Write down the Characteristics of MQTT.
6. What is Device and Component Integration?
7. Write about Application Development.
8. List out the applications of WSN.
9. Differentiate RFID Protocols and NFC protocols.
10. What are the CoAP methods?