IOT IMP TOPICS

List of Important PYQ-Tagged Topics (Unit-wise)

Unit 1: Introduction to IoT

- History of IoT (Timeline Awareness)
- How does an IoT System Actually Work? (Conceptual Model)
- Characteristics of the Internet of Things
- IoT Conceptual Framework
- What is IoT Architecture? (especially for Smart City Framework context)
- Different Layers of IoT Architecture (Standard 4-Layer Model, especially for Smart City Framework context)
- Sensors (Difference with Actuators/Transducers, Smart Sensor context)
- Actuators (Difference with Sensors/Transducers)
- Gateway (Importance in Device Management)
- M2M (Machine-to-Machine) Communication (Architecture vs. IoT Levels)
- IoT Protocols (CoAP, RESTful HTTP, MQTT, XMPP - functions)
- IETF Six-Layer Modified OSI Model for IoT/M2M
- Smart Sensor vs. Sensor Node
- Transducer (Difference with Sensor/Actuator)

Unit 2: IoT Networking, Platforms, Sensors, and Actuators

- Wireless Sensor Network (WSN) (Definition, Components, Advantages, Disadvantages)
- WSN Protocols (Data-Link, Network, Security, Application Layers)
- Node Behaviours in WSN
- Embedded Devices (System) in IoT (Basic Concept, IDE relevance)
- Overview of IoT Hardware Platforms (General knowledge & specific board questions)
  - Arduino (UNO components, pin structure, features, architecture, programming for IoT, sketch for blinking LED, connecting DHT sensor)
  - Raspberry Pi (Usages, architecture, features)
  - Netduino (Usages)
  - BeagleBone (Usages)
  - Intel Galileo (Usages)
- NFC and RFID Protocols (Comparison, for device communication in IoT)

- Sensors (Difference with Actuators/Transducers) - *Cross-listed as it's fundamental to both units and asked in Q1*
- Actuators (Difference with Sensors/Actuators) - *Cross-listed*
- Smart Sensor vs. Sensor Node - *Cross-listed*

Unit 3: Network & Communication Aspects in IoT

- Hidden Station Problem (HSP) (Implicitly related to CSMA/CA which is a data-link protocol)
- MAC (Medium Access Control) Layer (Definition, MAC Address assignment, Address Resolution)
- Data-Link Layer Protocols (in WSNs, including MAC types like CSMA/CA)
- RPL (Routing Protocol for Low-Power and Lossy Networks - why it's used)
- CoAP (Why used in place of HTTP)
- 6LoWPAN (Why used at adaptation layer, Header fields)

Unit 4: Arduino Platform, Anatomy, and IDE

- Arduino Platform Boards Anatomy (General components)
- Arduino UNO Board Anatomy (Specific components, Pin Structure, Features)
- Arduino IDE (General IDE concept requirement for prototyping)
- Programming Arduino for IoT (Connecting DHT sensor, writing program to read Temp/Humidity)
