

BCS701 IOT Important Questions

Module 1: Introduction to IoT

1. Define **IoT** and explain its four main characteristics with examples.
2. Describe the **Physical Design** of IoT, including the basic components of an IoT device.
3. Explain the **Logical Design** of IoT by describing the various functional blocks.
4. Explain the difference between **Request-Response** and **Publish-Subscribe** communication models.
5. Compare **Push-Pull** and **Exclusive Pair** communication models.
6. Discuss the **REST architectural constraints** for IoT APIs.
7. Summarize the **IoT Protocol Stack** (Link, Network, Transport, and Application layers).
8. Compare **TCP and UDP** and explain which is better for specific IoT scenarios.
9. Briefly explain the role of **Wireless Sensor Networks (WSN)** and **Cloud Computing** in IoT.
10. Describe **IoT Levels** to and explain how to choose a deployment template.

Module 2: IoT and MM

1. Define **MM** and explain its end-to-end architecture.
2. List five key **differences between IoT and MM** (e.g., protocols, data collection).
3. Explain the function of **MM Gateways** for non-IP devices.
4. Describe **Software Defined Networking (SDN)** and how it separates the Control and Data planes.
5. Explain the role of the **OpenFlow protocol** and flow tables in SDN.
6. Describe **Network Function Virtualization (NFV)** and its components (VNF, NFVI).
7. How do **SDN and NFV** work together to benefit IoT systems?.
8. Discuss the limitations of **SNMP** for managing IoT systems.

9. Why do network operators prefer **NETCONF over SNMP** for IoT management?.
10. Explain how **NETCONF and YANG** are used together for IoT system management.

Module 3: IoT Platforms Design Methodology

1. List and explain the **steps of the IoT Design Methodology**.
2. Describe the **Purpose and Requirements Specification** phase with an example.
3. Explain the **Process Specification** step in the design cycle.
4. Differentiate between the **Domain Model** and the **Information Model**.
5. What is **Service Specification** and how does it define IoT services?.
6. Describe the **Functional View** and **Operational View** specifications.
7. Explain the final steps: **Device Integration** and **Application Development**.
8. Walk through the design methodology for a **Weather Monitoring System**.
9. Why is **Python** the preferred language for IoT application development?.
10. Explain essential **Python packages** used in IoT (e.g., NumPy, Requests).

Module 4: IoT Physical Devices & Endpoints

1. Identify the basic **building blocks** of any IoT device.
2. Explain the hardware architecture of the **Raspberry Pi**.
3. Describe the functions of **GPIO pins** on a Raspberry Pi.
4. Discuss the common **Linux distributions** used on Raspberry Pi (like Raspbian).
5. Explain how **Serial, SPI, and IC** interfaces are used for communication.
6. Describe how to interface an **LED and a Switch** with Raspberry Pi using Python.

7. Explain the working of an **LDR (Light Dependent Resistor)** with an IoT device.
8. Outline the design of a **Home Automation system** using Raspberry Pi.
9. How is IoT applied in **Smart Cities**? Give examples of sensors used.
10. Describe an IoT case study for **Smart Agriculture**.

Module 5: Data Analytics for IoT

1. Explain the importance of **Clustering and Classification** in IoT data analysis.
2. Compare **Batch Analytics** and **Real-time Analytics** with an example.
3. Describe the **Apache Hadoop** architecture and its core components.
4. Explain the **MapReduce programming model** (Map, Combine, and Reduce phases).
5. Explain the roles of **NameNode** and **DataNode** in the Hadoop Distributed File System (HDFS).
6. Compare **Hadoop .x** and **Hadoop .x (YARN)** resource management.
7. How is Hadoop used for **Forest Fire Detection** data analysis?.
8. Explain how **Apache Oozie** manages workflows for IoT data.
9. Describe the **Apache Spark** ecosystem (Spark Streaming, SQL, MLlib).
10. Explain the **Apache Storm** architecture for real-time data analysis.