

Q7) Do any requirements

① Explain the characteristics of IOT with diagram

Characteristics of IOT diagram

- Connectivity : IOT devices need to communicate with each other, usually over the internet. This characteristic is essential for exchanging data
- Sensing - Sensors are crucial in IOT for collecting data from the environment such as temperature, humidity
- Data : IOT is a data driven. Devices collect data, which can then be processed, analysed and acted
- Intelligence : Many IOT system incorporate some level of artificial intelligence or machine learning to make sense of data and make decisions
- Action : IOT devices can take action based on collected data and processed insights, such as turning on a fan when a temperature threshold is met.

② Evolution of IoT:

Prior IoT Basic machine to machine communication without internet connectivity

Early IoT (1980s - 1990s):
Internet-connected devices emerge, but with limited functionality and connectivity options

IoT Expansion (2000s) Rapid growth
the development of WiFi, mobile networks and cloud computing, enabling more devices to connect

Modern IoT (2010s - Present):
widespread adoption across industries
Technologies such as 5G, AI

③ Interdependence and Reach of IoT over Various Application Domains

- Smart Homes: Devices like thermostats, security systems, and applications communicate over home networks.
- Health care: Wearable devices and connected medical equipment send data to health networks for monitoring and analysis.
- Industrial (IIoT): Sensors and machines on the factory.

④ IoT Networking Components with Di

Devices/Sensors: These are the end points that collect data from the physical world.

Gateways: These aggregate data from devices, translate protocols, and forward the data to the cloud.

Network Infrastructure: Routers, switches, and other components that facilitate communication b/w devices and data centers.

Cloud / servers = Storage and processing power where data is analysed and stored

⑤ 5 Addressing strategies in IoT

IP Addressing = IoT devices are often assigned IP addresses for internet connectivity

MAC Addressing = Each IoT device has a unique MAC addressing at a hardware level, which helps in local network identification.

IPv6 = A standard for addressing in lower IoT networks like 6LoWPAN

Naming and Directory services - IoT platforms often use a directory service to maintain mappings between human readable names and device addresses

⑥ Address management class

Static Addressing :- Devices are assigned a fixed address, which is useful in stable environments

Dynamic Addressing :- Devices obtain address dynamically through protocols like DHCP

Hierarchical Addressing :- Address are assigned based on the context