Q1. Explain domain model of IoT in detail.

Ans. The domain model of the Internet of Things (IoT) refers to the way in which objects or devices that are connected to the internet are organized and managed.

At the most basic level, the domain model of IoT consists of three main components:

1. Things: These are the objects or devices that are connected to the internet and are able to collect, transmit, and receive data. Examples of things in the IoT include smart thermostats, wearable fitness devices, and smart home appliances.
2. Connectivity: This refers to the way in which things are connected to the internet and able to communicate with one another. This can be through a variety of technologies, such as WiFi, Bluetooth, or cellular networks.
3. Data: The data generated by things is collected, transmitted, and analyzed to gain insights and make decisions. This data can be used to improve the functionality and efficiency of the things themselves, as well as to optimize the overall system.

Q2. Explain IoT reference model in detail with protocols at each layer.

Ans.

1. Device layer: This is the layer at which the actual physical devices or "things" that make up the IoT system are located. These devices are equipped with sensors and actuators that allow them to collect and transmit data, as well as to perform certain actions based on that data.
2. Communication layer: This layer is responsible for enabling the devices to communicate with one another and with the other layers of the system. This communication can be via a variety of technologies, such as WiFi, Bluetooth, or cellular networks. Protocols commonly used at this layer include MQTT, CoAP, and XMPP.
3. Network layer: This layer is responsible for routing the data between devices and providing connectivity to the internet. Protocols commonly used at this layer include TCP/IP, HTTP, and HTTPS.
4. Application layer: This is the top layer of the IoT reference model and is where the data generated by the devices is collected, analyzed, and used to provide value to the user. This can be through the development of various applications and services that utilize the data in some way. Protocols commonly used at this layer include HTTP, REST, and JSON.

Q3. Write a short note on architecture of IoT with explanation of different layers.

Ans.

Q4. Explain Internet of Things with its applications.

Ans. The Internet of Things (IoT) refers to the connection of devices, such as everyday objects or appliances, to the internet, allowing them to send and receive data. This allows for the automation and control of these devices, as well as the ability to monitor and track their usage and performance.

Some examples of applications of the IoT include:

1. Smart homes: IoT devices can be used to automate and control various aspects of a home, such as lighting, heating, and security. For example, a smart thermostat can be programmed to adjust the temperature based on the time of day or the presence of people in the home, and a smart door lock can be controlled remotely.
2. Wearable devices: These are devices that can be worn on the body and are connected to the internet. Examples include fitness trackers and smartwatches. These devices can track various metrics, such as steps taken and heart rate, and provide feedback to the user.
3. Industrial applications: IoT can be used to improve efficiency and optimize processes in industrial settings. For example, sensors can be placed on machinery to monitor performance and alert maintenance staff when repairs are needed.
4. Transportation: IoT can be used to improve the efficiency and safety of transportation systems. For example, sensors can be placed on vehicles to track their location and monitor their performance, and traffic patterns can be analyzed to optimize routes.
5. Agriculture: IoT can be used to optimize and improve agricultural practices. For example, sensors can be placed on fields to monitor soil moisture and temperature, and irrigation systems can be automated based on this data.

Q5. Describe characteristics of M2M technology and explain how M2M and IoT differ.

Ans.