1. **What is a sensor? List different types of Analog and Digital sensors.**

A sensor is a device that detects the change in the environment and responds to some output on the other system. A sensor converts a physical phenomenon into a measurable analog voltage (or sometimes a digital signal) converted into a human-readable display or transmitted for reading or further processing.

Different types of Analog and Digital sensors are:

Analog Sensors:

Accelerometers

Light Sensors

Sound Sensors

Pressure Sensor

Analog Temperature Sensor

Digital Sensors:

Digital Accelerometers

Digital Temperature Sensor

1. **Give the details of BME280 sensor. What are the ranges supported by this sensor?**

**BME280** Temperature, Humidity and Pressure **Sensor**

At the heart of the module is the next-generation digital temperature, humidity and pressure sensor manufactured by Bosch – BME280. It’s a successor to sensors like BMP180, BMP085 or BMP183.

This precision **sensor** can measure relative humidity from 0 to 100% with ±3% accuracy, barometric pressure from 300Pa to 1100 hPa with ±1 hPa absolute accuracy, and temperature from -40°C to 85°C with ±1.0°C accuracy.

1. **Write What is an IO Expander?**

It is an input/output port expander to interface digital asci's via 2-dimensional bus(I2c)

- Io expander can easily expand the functions such as GPIOs , keypad, LEDs to the existing system

Semtech IO Expander products consist of General Purpose parallel Input/Output (GPIO) expanders, which are ideal for low power handheld battery powered equipment. Our IO expanders come in 4-, 8-, and 16-channels of IOs operating with a VDD range of 1.2V to 5.5V connecting easily to today's low core voltage chipsets in battery powered handheld applications without the need for level translating circuits.

1. **What are the power modes supported by BME280?**

The sensor can be operated in three power modes: Sleep mode, normal mode and the forced mode. What is the role of MCP3008?

1. **Write the applications of BME280?**

It is used for Warning regarding dehydration or heat stroke. It is used for Measurement of lung volume and air flow. It is used in Home automation control. It is used for Control heating, ventilation, air conditioning (HVAC).