CSE360 Assignment-01

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Section: 07

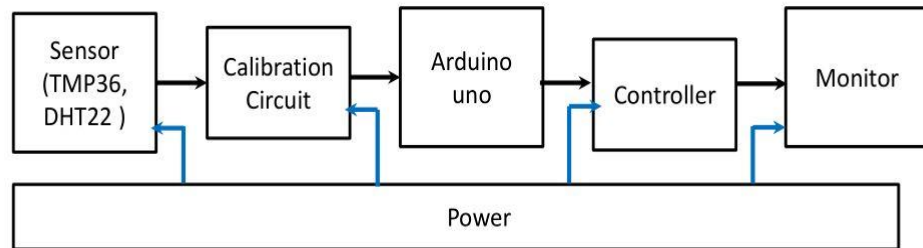# Answer to the Question No. 1

Exchange of information between two devices/components is known as interfacing. In the given scenario we will take inputs from temperature and humidity sensors and display the values on a monitor.

Sensors/Components: Temperature sensor TMP36, humidity sensor DHT22, Arduino uno, monitor, battery as power source.

Interfacing and mechanism: We are communicating between sensors and microcontroller. So, it's an external interfacing with a low end device. We'll first take the inputs (temperature, humidity) from the sensors. Since it's a low end input device, we'll get the inputs in voltage. To convert them into digital signals (0 and 1) we'll require a calibration circuit. Calibration circuit will be responsible for converting the data to digital format, in which our microcontroller will be able to read the data. This unit is also responsible for modulation, rectification of the data if necessary. After that, the Arduino will receive the data in required format and process the data according to given instruction. In the next step, a driver/controller will prepare the output data in necessary format. This component is responsible for voltage/ power enhancement if necessary. Everything required to achieve the required output format will be done by this unit. After that, the data will be shown to our monitor. The whole process will require power from the battery.

Interfacing diagram is given below:

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┌──────────┐     ┌──────────┐     ┌──────────┐     ┌──────────┐     ┌──────────┐
│  Sensor  │ ──▶ │Calibration│ ──▶ │ Arduino  │ ──▶ │          │ ──▶ │ Monitor  │
│ (TMP36,  │     │  Circuit  │     │   uno    │     │Controller│     │          │
│ DHT22 )  │     │          │     │          │     │          │     │          │
└──────────┘     └──────────┘     └──────────┘     └──────────┘     └──────────┘
┌────────────────────────────────────────────────────────────────────────────┐
│                                  Power                                       │
└────────────────────────────────────────────────────────────────────────────┘
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Answer to the Question No 2

Ports work as connection points or interfaces for external peripheral devices. USB port is used to connect mouse, keyboard, printer etc. with our computer. It is also used in charging different portable devices. Over the years we have seen the evolution of USB from USB type A, type B, type B mini, micro USB B and now type C. Here's a comparison among these types.

Type A	Type B	Type B mini	Micro USB B	Type C
It is a big rectangle in shape	It looks like a block, squared shaped plug	It is small rectangle in shape	Smaller and flatter than the previous ones	Flatter but with a sides are bigger
contains 4 pins	4 pins	5 pins	5 pins	24 pins

USB type C can deliver up to 20V, 5A and 100W of power for charging which makes it faster than any other previous USB ports. USB type C makes full use of USB 3.1, 3.0 technology which enables it to transfer data up to 10Gbps. Whereas, a micro USB B can transmit data up to 480 Mbps. With higher data transfer speed, transmitting 4k videos to a screen has become effortless. USB type C also supports USB 3.1, 3.0, 2.0, 1.1 signals, which makes it more reliable. Thanks to its flexible design people can plug it whichever way they want without worrying which side is up or down. So, because of more pins, higher transfer speed, handiness, easy to use and one port for all device mechanisms the tech giants like Samsung, Google are replacing older USB types with type C.