

Final Assessment | Spring 2023

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CSE - 21st Batch | Course Title: Computer Peripherals & Interfacing

Course Code: CSE - 333 | ID: 2121210071

Answer to the Question no- 1

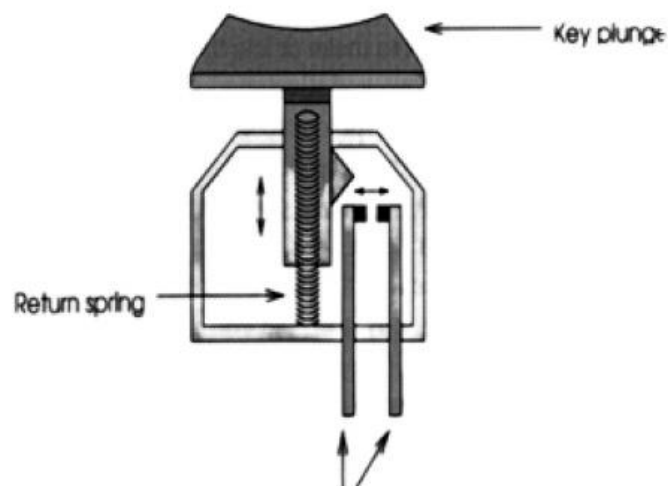
(a)

Keyboard-

- A keyboard is a bank of switches whose individual states can be detected by the computer system.
- A series of single state switches on any domestic electrical appliance can be regarded as a keyboard.
- QWERTY keyboard
- Can produce all characters in the common character sets such as ASCII.

Contact Type Keyboard Switch Mechanism-

- Widely used switches.
- Pressing the key plunger causes the contacts to touch and to produce a voltage.
- Key bounce --- the contacts may bounce when the plunger is depressed giving the appearance of several rapid key depressions. This effect is known as key bounce. This must be eliminated by special circuitry which effectively ignores the key after its first depression for a very short period of time.

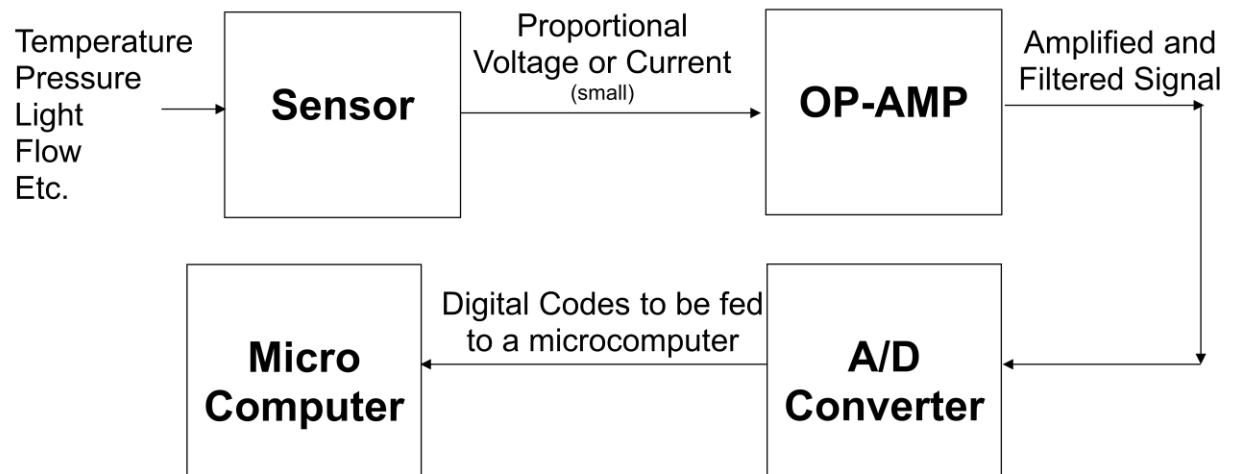


(b)

Basic Concept: Analog Interfacing-

An analog interface is an electrical connection that forwards analog electric signals to downstream electric and electronic devices or components for further processing. Standardised analog interfaces (e. g. 0/4 - 20 mA and 0/2 - 10 V) are also referred to as standard signals.

In order to control the machines in Electronics Factory, Medical Instruments, Automobiles etc. We need to determine the values of some variables like pressure, temperature, light, flow etc.



Answer to the Question no- 2

(a)

Sensor-

A sensor is a device that detects and responds to some type of input from the physical environment. The input can be light, heat, motion, moisture, pressure or any number of other environmental phenomena.

Different Types of Sensors-

1. Temperature Sensor
2. Accelerometer
3. IR Sensor (Infrared Sensor)
4. Pressure Sensor
5. Light Sensor
6. Ultrasonic Sensor
7. Smoke, Gas and Alcohol Sensor
8. Touch Sensor
9. Color Sensor

Different Types of Transducers-

1. Magnetic field transducers
2. Pressure transducers
3. A piezoelectric transducer
4. Thermocouples
5. An Electromechanical transducer
6. Mutual induction transducers
7. Strain gauges
8. Current transducers

(b)

Advantages of Thermocouple-

- One particular advantage of thermocouples is that the sensing elements themselves are very small, allowing thermocouples to be inserted into very small spaces and to respond to rapidly changing temperatures

Disadvantages of Thermocouple-

- The shape of the typical characteristic is shown in Fig. 1.2, from which we can see that the thermocouple is useful only over a limited range of temperature due to the non-linear shape of the characteristic.
- The output from a thermocouple is small, of the order of millivolts for a 10°C temperature difference. Because of the small voltage output, amplification is usually needed unless the thermocouple is used for temperature measurement along with a sensitive millivoltmeter.

Answer to the Question no- 3

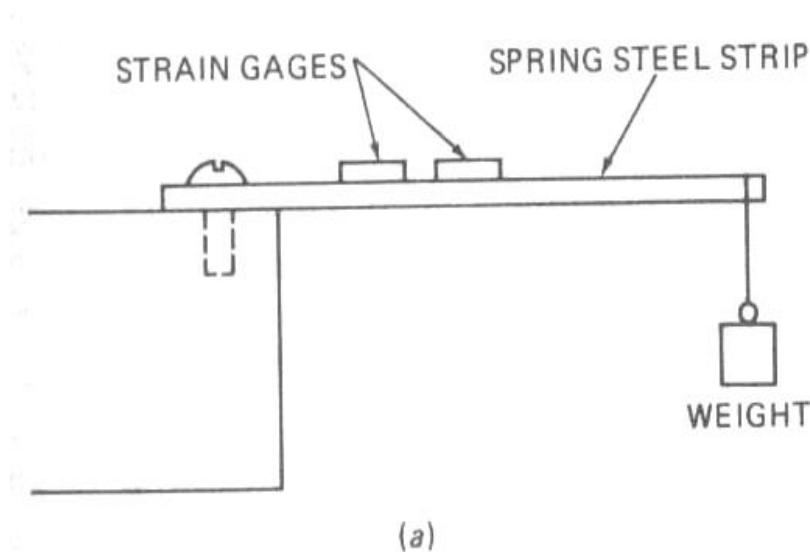
(a)

Strain Gage-

A small resistor whose value changes when its length is changed. It may be made of thin wire, thin foil or semiconductor material.

How does Strain Gage work-

- One end of a piece of spring steel is attached to a fixed surface.
- A strain gage is glued on top of the flexible bar.
- The force or weight to be measured is applied to the unattached end of the bar.
- As the applied force bends the bar, the strain gage is stretched, increasing its resistance.
- The change in resistance is directly proportional to the applied force.
- If a current is passed through the strain gage, then the change in voltage across the strain gage will be proportional to the applied force.
-



(b)

Paddle Wheel Method-

- A paddle wheel is put in the flow as in Fig.10-13a
- The rate at which paddle wheel turns is proportional to the rate of flow of a liquid or gas.

An optical encoder can be attached to the shaft of the paddle wheel to produce digital information as to how fast the paddle wheel is running

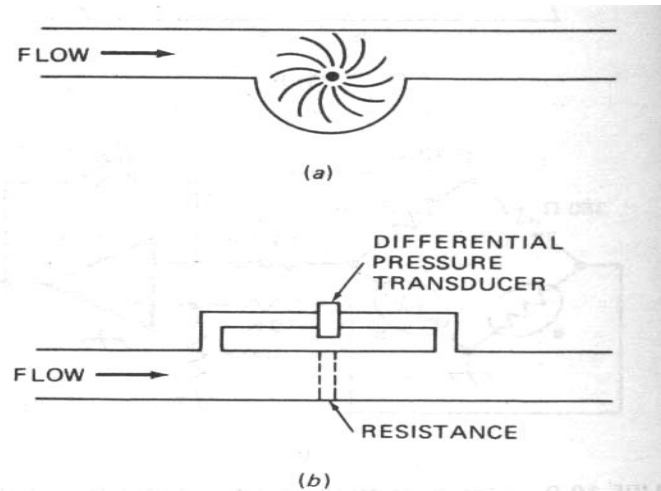


FIGURE 10-13 Flow sensors. (a) Paddle wheel. (b) Differential pressure.

Answer to the Question no- 5

(a)

Peripheral Adapter-

A peripheral adaptor works as an interface between CPU (very fast) and a peripheral device (relatively slow) for data communication.

Data Highways Bus Architecture-

- ▶ Data (including programs) are moved around the computer on a set of wires forming a data highway (Bus)
- ▶ Address Bus, Control Bus, Data Bus

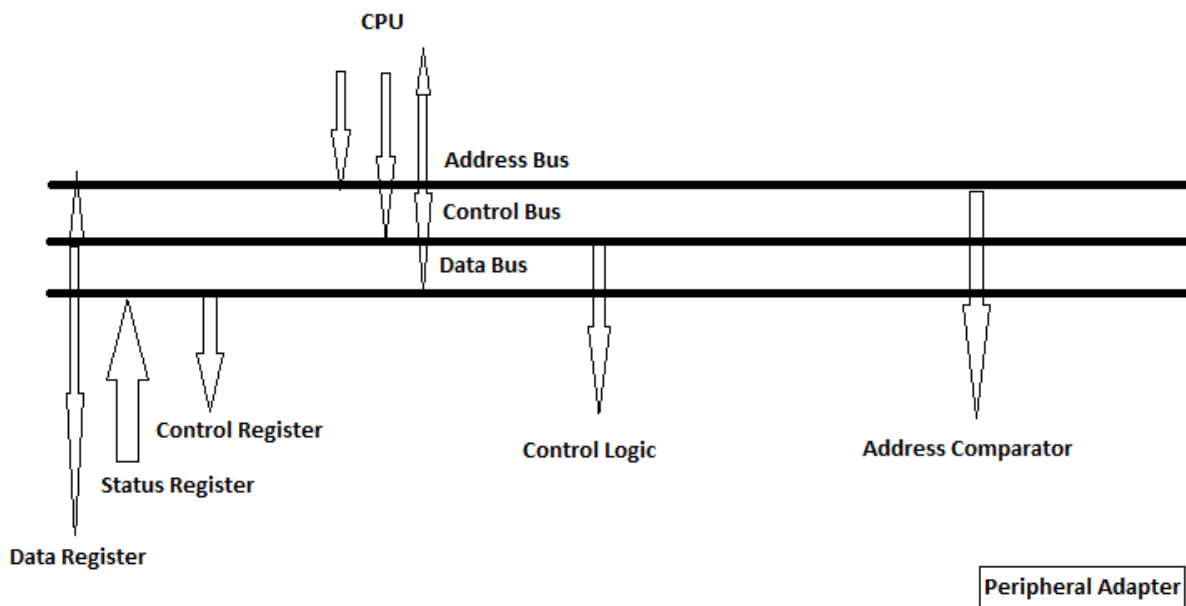


Fig: Connection of Peripheral Adapter to Highway

(b)

Priority Interrupts Connection Using Daisy-Chain

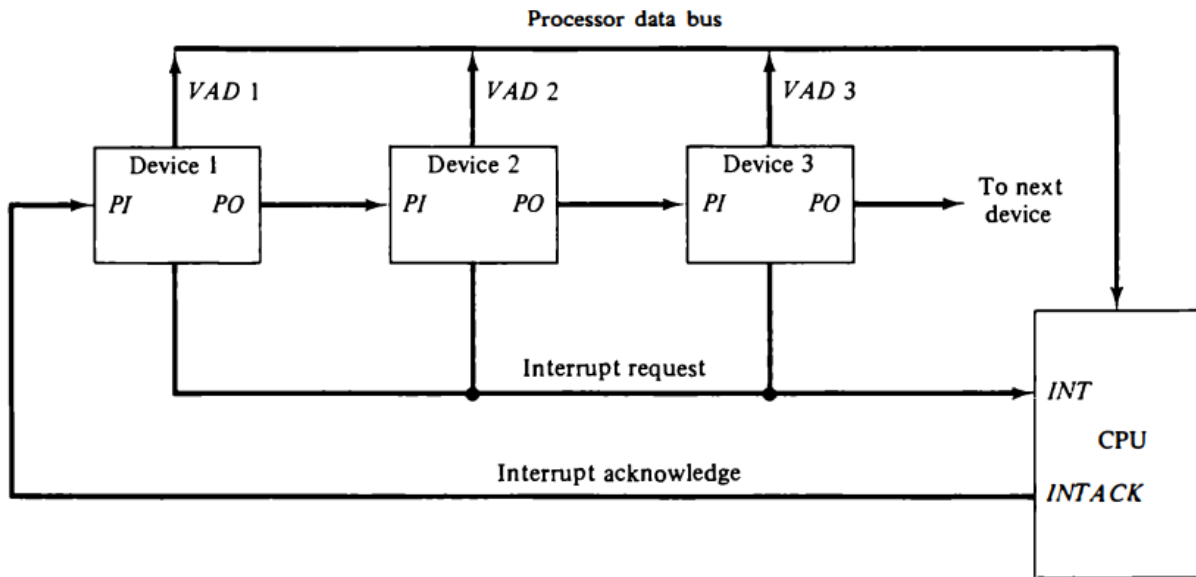


Fig: Daisy-Chaining Priority interrupt