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Batch : 17th

Course Title : Computer peripherals and Interfacing

Course code : CSE 333

Ans to the Qus No: 01 (a)

Ans: A contact type keyboard switch mechanism refers to the technology and used in keyboards to register keystrokes when a key is pressed. It involves the physical contact between the keycap and a switch mechanism underneath, which generates an electrical signal indicating the pressed key.

In a contact-type keyboard switch mechanism, each key on the keyboard has an individual switch that registers the keystroke. When a key is pressed, it pushes down on a pot plunger or stem inside the switch mechanism. This downward forces causes the switch to make contact completing an electrical circuit and sending a signal to the computer or deriee.

The design and construction of contact-type keyboard switches can vary depanding on the specifi switch techology used. Some common types of contact-types keyboard switches include:

① Dome-Switch:

Dome-switches consist of a rubber or silicone dome with a conductive pad underneath. When the key is pressed, the dome collapses, making the conductive pad contact the underlying circuit board, registering the keystroke.

② Membercane Switch:

Membrane switches use a flexible membrane with

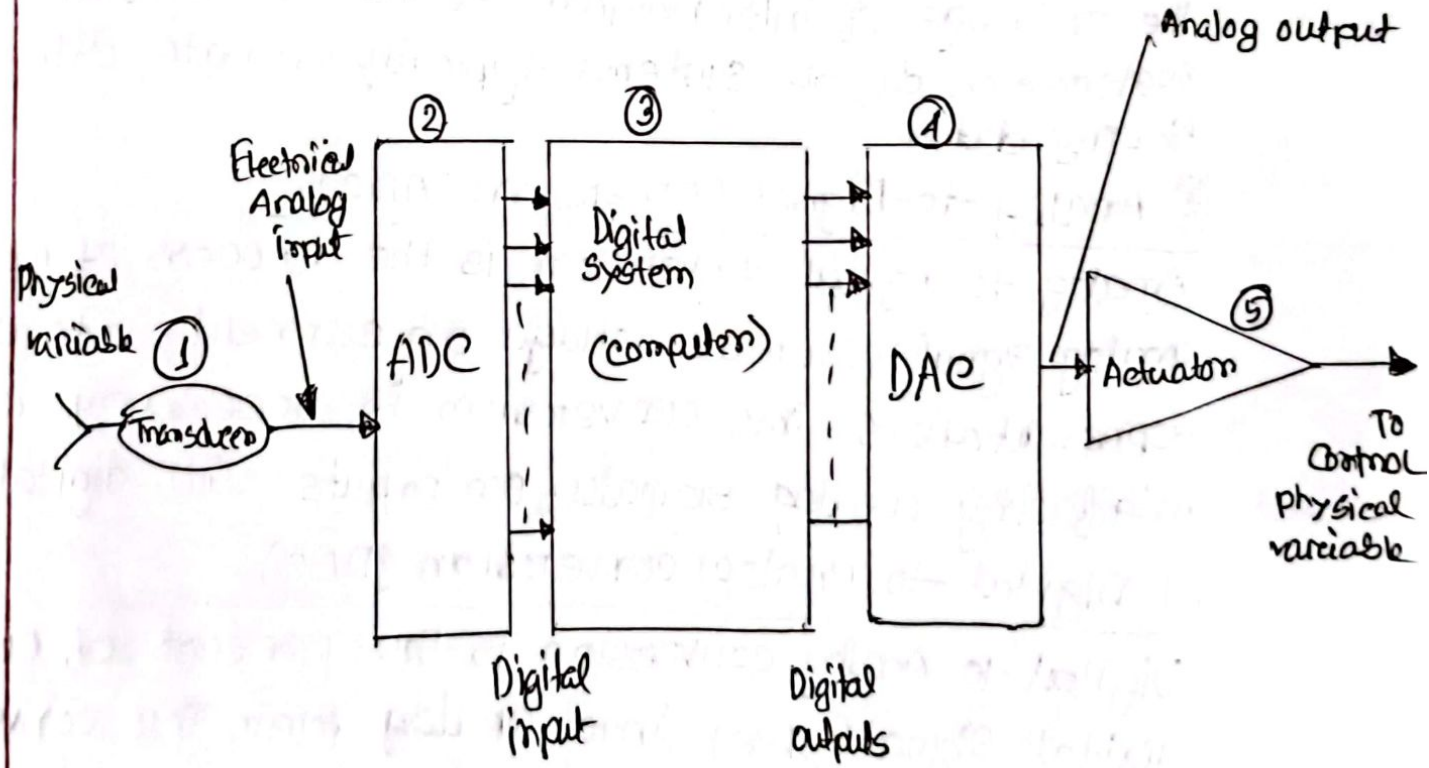
printed conductive traces. When a key is pressed, it causes the membrane to bend and make contact with the underlying circuit, registering the keystroke.

⑤ Mechanical Switch:

Mechanical switches are more complex and robust than dome or membrane switches. They typically consist of a spring-loaded plunger and metal contacts. When the key is pressed, the plunger compresses the spring, closing the metal contacts and registering the keystroke.

Ans to the Qus No: 01 (b)

Ans: The basic consept of Analog interfacing.



Analog interfacing involves the connection and communication between analog devices or systems. It refers to the process of converting analog signals from one form to another, enabling compatibl and interfacing between different analog devices or components.

To understand the basic concept of analog interfacing.

① Signal Conversion:

Analog interfacing often involves the conversion of signals from one form to another. for example it may include converting an analog signal into a digital signal or vice versa. The conversion enabl the exchange of information between analog and digital systems, as digital systems typically operate with discre binary data.

② Analog-to-Digital conversion (ADC):

Analog to digital conversion is the process of convert analog signals, such as voltage or current, into digital representations. This conversion is necessary when interfacing analog signals, or inputs with digital syste

③ Digital-to Analog conversion (DAC):

Digital to Analog conversion is the process of converti digital signals back into analog form. This conversion is often required when interfacing digital systems with analog outputs such as speakers, actuators or control systems.

④ Signal Conditioning :

Analog interfacing often involves signal conditioning to ensure accurate and reliable signal transmission and processing. Signal conditioning includes various techniques and components that modify or enhance the analog signal before or after conversion. common signal conditioning techniques. Include amplification, linearization and impedence matching.

⑤ Interface circuits :

Analog interfacing may require the use of specific interface circuits or components to establish connections and enable signal transmission between analog devices. These interface circuits act as mediators between different analog components or systems, ensuring compatibility and proper signal transfer.

In summary, the basic concept of analog interface involves the conversion of signals between analog and digital forms; signal conditioning to enhance signal quality, and the use of interface circuits to establish connections and enable communication between analog components or systems. By effectively interfacing analog devices. It becomes possible to integrate analog communication.

Ans to the Qus NO: 02(a)

Ans: Sensor:

A sensor is a device or element that detects and measures physical or environmental properties and converts them into a measurable electrial or optical signal. Sensors are commonly used in various field to monitor, control and gather data about their surroundi They play a crucial role in numerous applications, including industrial automation, environmental monitoring, healthcare, robotics and more.

Here are some commonly used sensors and transducer across different domains:

1. Temperature Sensor.
2. Pressure Sensor.
3. Proximity sensor.
4. Accelerometer.
5. Gyroscope
6. Light Sensor
7. Humidity sensor.
8. Magnetic Sensor.
9. Gas Sensor.
10. Flow Sensor
11. pH sensor.
12. Position Sensor

Ans to the Qus No: 02(b)

Ans: Advantages of thermocouple Sensors:

① Wide temperature range:

Thermocouple can measure a wide range of temperatures. from very low to very high temperatures, making them suitable for a wide range of applications.

② Fast Response Time:

Thermocouples have a rapid response time, allowing for real-time temparature measurements and quick detection of temperature changes.

③ Durability and Robustness:

Thermocouples are known for their durability and ability to withstand harsh environments, including high temparature vibrations, and mechanical stress.

④ Simple and cost-Effective:

Thermocouples are relatively simple in design and construction resulting in lower manufacturing costs compared to other temparature sensors.

⑤ self-powered:

Thermocouples generate their own voltage when there is a temperature difference between the measurement point and the reference junction, eliminating the need for an external power source.

Disadvantages of Thermocouple Sensors:

① Lower accuracy:

Thermocouples typically have lower accuracy compared to other temperature sensors, such as RTDs (Resistance Temperature Detectors) or thermist The accuracy can be affected by factors like measurement range, sensor aging, and non-linear

② Non-Linear Output:

The voltage output of thermocouples is not linear proportional to temperature. This non-linearity can be introduce errors in temperature measurem especially in applications requiring high precision

③ Cold Junction Compensation:

Thermocouples require compensation for the temperat difference between the measurement point and the reference junction (cold junction). Failure to accura compensate for this temperature difference can introdu measurement errors.

④ Limited Repeatability:

Thermocouples may exhibit limited repeatability; meaning that they might not provide the exact same output for the same temperature under repeated measurements.

Ans to the Qus No:03(a)

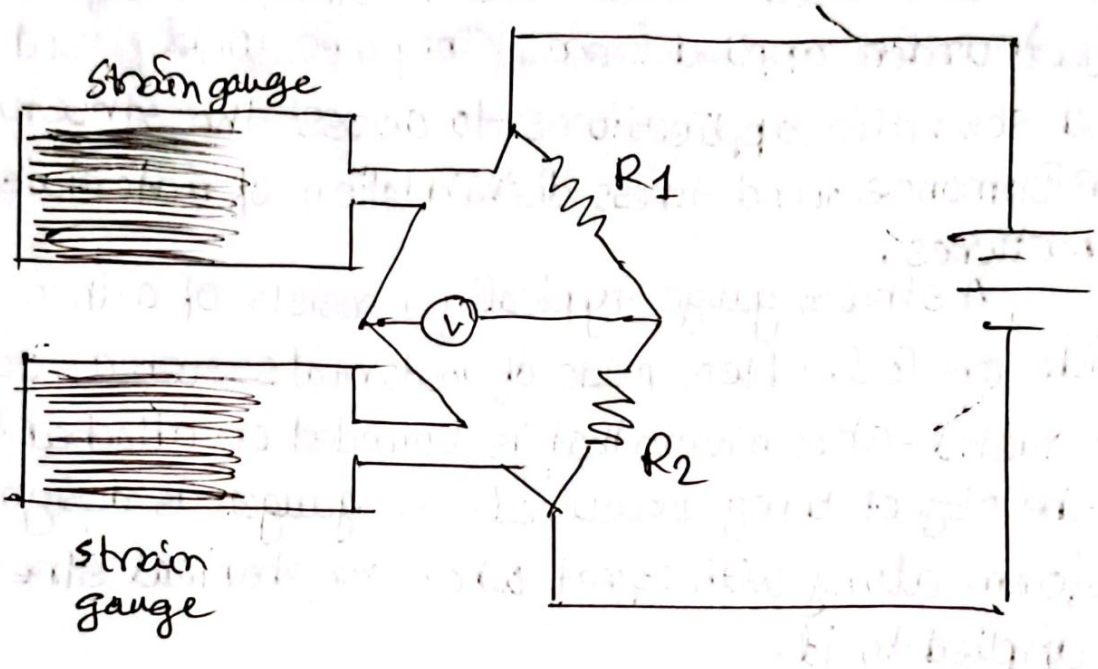
Ans: Strain gauge :

Strain gauges, also known as strain gages or strain sensors are devices used to measure the strain or deformation of an object under applied forces. They are widely used in engineering and scientific applications to assess the structural integrity, performance, and stress distribution of materials and structures,

A strain gauge typically consists of a thin metallic wide or foil, often made of materials such as constantan or nickel-chromium, that is bounded or attached to the surface of the object being measured. The gauges is designed to deform along with object when mechanical stress or strain is applied to it.

When the object experiences deformation, the strain gauge undergoes a corresponding change in length or shape, This alteration in the gauge's geometry leads to a change in its electrical resistance. The strain gauge operates on the principle of the piezoresistive effect, where the electrical resistance of certain materials changes in response to mechanical strain. To measure the strain, the strain gauge is connected to a wheatstone bridge circuit, which consists of several resistors, including the strain gauge itself. The wheatstone bridge configuration allows for highly sensitive measurement of small changes in resistance. As strain is applied to the gauge, it causes an imbalance in

the bridge circuit. resulting in an output voltage that can be correlated to the applied force or str

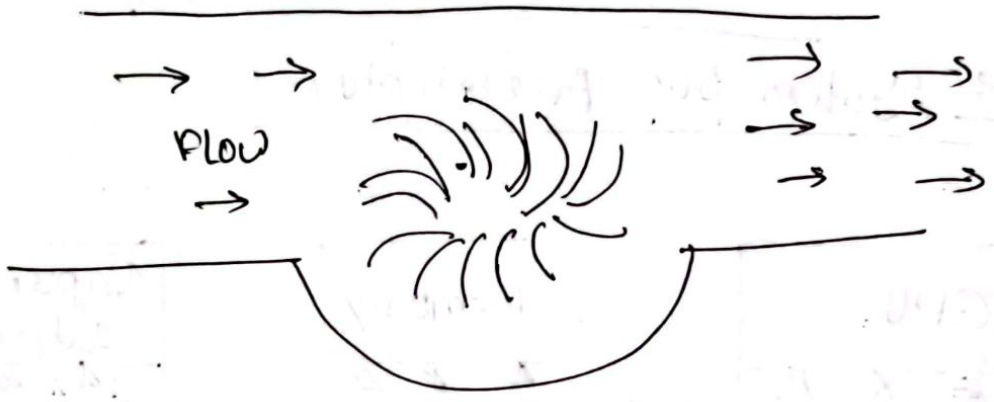


Strain gauges offer several advantages, such as hi sensitivity advantages, such as high sensitivity, accur and versatility. They can be used to measure varia types of strains, including tensile, compressive, an shear strains. Strain gauges find applications in field like structural engineering, aerospace, automoti bio mechanices. and material testing, where pre strain measurement are necessary for desig analysis, and quality control purposes.

Ans to the Qus No: 03 (5)

Ans: Paddle wheel method:

Paddle wheel work is a process involving friction in which the volume of the system does not change at all, and still work is done on the system



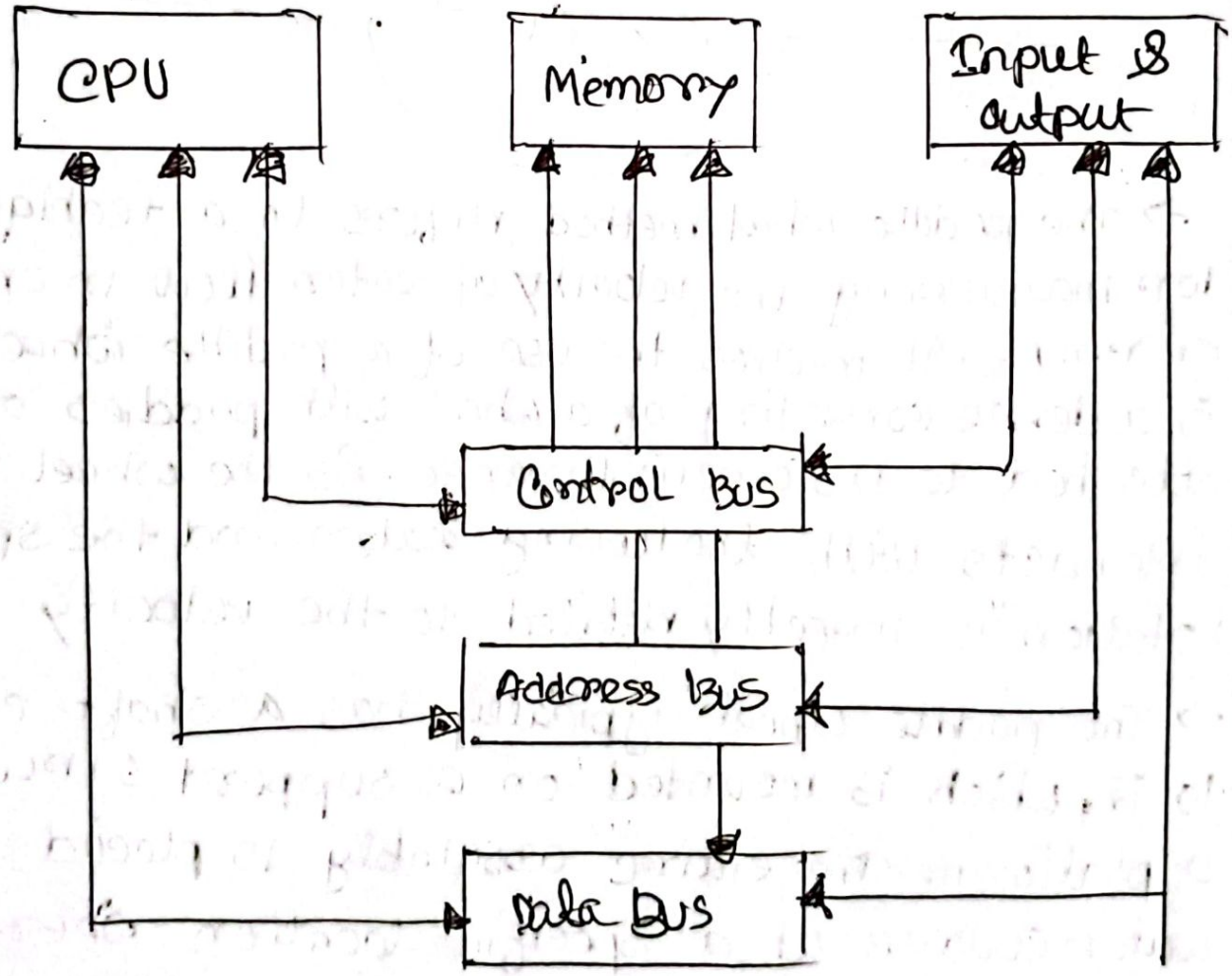
→ The paddle wheel method refers to a teehique used for measuring the velocity of water flow in open channels or rivers. It involves the use of a paddle wheel. which is a device consisting of a wheel with paddles or blades attached to its circumference. As the wheel rotates, it interacts with the flowing water. and the speed of rotation is directly related to the velocity of the wate

→ The paddle wheel typically has a shaft connected to it, which is mounted on a support structure or a platform. The entire assembly is placed in the water course at a specific location where the velocity is to be measured. The paddle wheel is aligne such that its axis of rotation is perpendicular to

the flow direction of the water.
→ When the water flows past the paddle whe the force of the moving water pushes against the paddles or blades causing the wheel to rot The rotation speed is proportional to the wate velocity with higher speeds resulting in faster rotation.

Ans to the Qus NO: 05 (a)

Ans: System bus Architecture:



System Bus

Peripheral adapter: A peripheral adapter also known as an interface adapter, is a device or component that allows peripheral devices to connect and communicate with a computer system. It serves as an intermediary between the computer and peripheral enabling the exchange of data and control signals.

Ans to the Qus No: 05(b)

Ans: Priority Interrupt: