1. What is a sensor?

a) A device that converts physical quantities into electrical signals
b) A device that converts electrical signals into physical quantities
c) A device that stores data
d) A device that amplifies signals

Answer: a) A device that converts physical quantities into electrical signals
Explanation: A sensor is a device that detects and responds to some type of input from the physical environment, converting it into an electrical signal.

2. Which of the following is a basic component of a sensor node?

a) Processor
b) Memory
c) Transducer
d) All of the above

Answer: d) All of the above
Explanation: A sensor node typically consists of a processor for data processing, memory for storing data, and a transducer for sensing physical quantities.

3. What are some challenges associated with sensor nodes?

a) Power consumption
b) Communication range
c) Data processing capabilities
d) All of the above

Answer: d) All of the above
Explanation: Sensor nodes face challenges such as power consumption, limited communication range, and constraints on data processing capabilities.

4. Which of the following is a feature of sensors?

a) Accuracy
b) Sensitivity
c) Linearity
d) All of the above

Answer: d) All of the above
Explanation: Sensors possess various features including accuracy, sensitivity, linearity, and many others depending on their intended application.

5. Sensor resolution refers to:

a) The smallest change in input that can be detected
b) The maximum range of input the sensor can handle
c) The speed at which the sensor responds to input changes
d) The physical size of the sensor

Answer: a) The smallest change in input that can be detected
Explanation: Resolution is the smallest change in input quantity that can be detected by the sensor.

6. Which sensor class operates with continuous analog signals?

a) Analog
b) Digital
c) Scalar
d) Vector

Answer: a) Analog
Explanation: Analog sensors produce output signals that are continuous and proportional to the physical quantity being measured.

7. Digital sensors produce output signals that are:

a) Continuous
b) Discrete
c) Non-linear
d) Proportional

Answer: b) Discrete
Explanation: Digital sensors produce output signals that are discrete, typically in the form of binary values (0s and 1s).

8. Scalar sensors measure:

a) Magnitude only
b) Direction only
c) Both magnitude and direction
d) Neither magnitude nor direction

Answer: a) Magnitude only

Explanation: Scalar sensors measure only the magnitude of a physical quantity, not its direction.

9. Vector sensors measure:

a) Magnitude only
b) Direction only
c) Both magnitude and direction
d) Neither magnitude nor direction

Answer: c) Both magnitude and direction
Explanation: Vector sensors measure both the magnitude and direction of a physical quantity.

10. Which of the following is not a type of sensor?

a) Temperature sensor
b) Pressure sensor
c) Bias sensor
d) Motion sensor

Answer: c) Bias sensor
Explanation: Bias is not a type of sensor, but rather a characteristic or error associated with sensor measurements.

11. Sensor bias refers to:

a) Deviation of sensor readings from true values

b) Variation in sensor readings over time
c) Accuracy of sensor readings
d) Precision of sensor readings

Answer: a) Deviation of sensor readings from true values
Explanation: Sensor bias is the systematic deviation of sensor readings from true values.

12. Sensor drift is characterized by:

a) Sudden changes in sensor readings
b) Variation in sensor readings over time
c) Consistent deviation of sensor readings
d) Precision in sensor readings

Answer: b) Variation in sensor readings over time
Explanation: Sensor drift is the gradual change or variation in sensor readings over time.

13. Hysteresis error in sensors refers to:

a) Inaccuracy due to non-linear response
b) Variation in sensor readings over time
c) Consistent deviation of sensor readings
d) Sudden changes in sensor readings

Answer: a) Inaccuracy due to non-linear response
Explanation: Hysteresis error occurs when a sensor’s output value depends not only on its current input but also on its past inputs, leading to non-linear response.

14. Quantization error occurs in:

a) Analog sensors
b) Digital sensors
c) Scalar sensors
d) Vector sensors

Answer: b) Digital sensors
Explanation: Quantization error arises in digital sensors due to the discrete nature of their output values.

15. An actuator is a device that:

a) Converts electrical signals into physical quantities
b) Converts physical quantities into electrical signals
c) Stores data
d) Amplifies signals

Answer: a) Converts electrical signals into physical quantities
Explanation: An actuator is a device that receives electrical signals and converts them into physical actions or quantities.

16. Which type of actuator uses fluid power to generate motion?

a) Hydraulic
b) Pneumatic
c) Electrical
d) Thermal/magnetic

Answer: b) Pneumatic
Explanation: Pneumatic actuators use compressed air to generate motion.

17. Electrical actuators convert electrical energy into:

a) Mechanical energy
b) Thermal energy
c) Magnetic energy
d) Fluid power

Answer: a) Mechanical energy
Explanation: Electrical actuators convert electrical energy into mechanical energy to produce motion.

18. Soft actuators are characterized by their:

a) Rigid structure
b) Flexibility
c) Large size
d) Complexity

Answer: b) Flexibility
Explanation: Soft actuators have a flexible structure, allowing them to deform or change shape in response to stimuli.

19. Mechanical actuators utilize which form of energy for generating motion?

a) Electrical

b) Fluid
c) Thermal
d) Mechanical

Answer: d) Mechanical
Explanation: Mechanical actuators generate motion using mechanical energy, often through mechanisms such as gears, levers, or cams.

20. Which type of actuator utilizes temperature or magnetic fields to produce motion?

a) Hydraulic
b) Pneumatic
c) Electrical
d) Thermal/magnetic

Answer: d) Thermal/magnetic
Explanation: Thermal/magnetic actuators use temperature changes or magnetic fields to produce motion.

Related posts:

1. Introduction to Information Security
2. Introduction to Information Security MCQ
3. Introduction to Information Security MCQ
4. Symmetric Key Cryptography MCQ
5. Asymmetric Key Cryptography MCQ
6. Authentication & Integrity MCQ
7. E-mail, IP and Web Security MCQ