TE 2. Unit 9.2. **SURNAME NAME GROUP**

Task 1: Match each sensor characteristic on the left with its correct classification on the right.

Term	Definition
1. **Sensor**	A. A device that converts energy from one form to another; all sensors and actuators are transducers
2. **Actuator**	B. A representation of physical information in the form of voltage, current, frequency, or pulse width
3. **Processor**	C. The resulting action, data, or control signal produced by a system after processing
4. **Transducer**	D. A device that measures a physical phenomenon and converts it into an electrical signal
5. **Conversion**	E. A device that converts electrical energy into mechanical motion or physical effect
6. **Output**	F. A digital circuit that executes instructions to process input signals and generate control outputs
7. **Electrical signal**	G. The transformation of a physical quantity into an electrical quantity, or analog signal into digital data

Task 2: Complete the sentences using the correct terms from the word bank:

actuator, transducer, detection, processor, conversion, passive

1. The three stages of how a sensor works are _____, _____, and output.

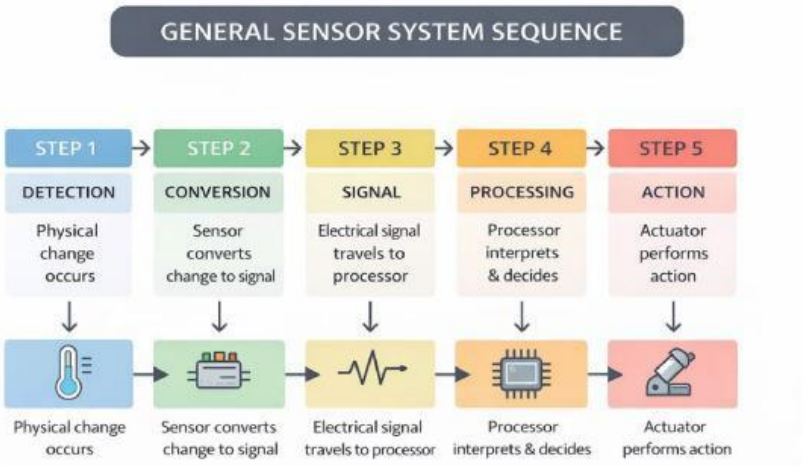
2. A _____ is a complete system that includes a sensor, processor, and actuator working together.

3. The _____ interprets the electrical signal and decides what action to take.

4. A _____ sensor requires external power to function properly.

5. The _____ is the component that performs the physical action based on the processor's command.

Task 3: Sequence the Process



A smoke detector system works through several steps. Number them in the correct order (1–5)

Description	Order
A. The processor receives the electrical signal	
B. Smoke particles are detected in the air	
C. The alarm sounds to alert people	
D. The sensor converts smoke detection into an electrical signal	
E. The processor activates the alarm (actuator)	

Task 4: Read each scenario and identify which stage (Detection, Conversion, or Output) is failing.

1. Scenario A: A humidity sensor correctly detects high moisture in a room and converts it to an electrical signal, but the dehumidifier never turns on. Which stage is failing?

2. Scenario B: A light sensor in a parking lot detects darkness but produces no electrical signal. The lights remain off. Which stage is failing?

3. Scenario C: A proximity sensor in an elevator detects a person approaching but sends a corrupted signal, causing the doors to open at the wrong time. Which stage is failing?

Task 5: Match each real-world scenario with the most appropriate sensor type.

Scenario	Sensor Type
1. A smartphone automatically rotates its screen when you turn it sideways	A. Temperature sensor
2. A refrigerator maintains a constant cold temperature inside	B. Motion sensor
3. An industrial conveyor belt stops when it detects overweight packages	C. Pressure sensor
4. A smart home system turns on lights when someone enters a dark room	D. Acceleration sensor
5. An aircraft measures altitude changes during flight	E. Load sensor

Task 6: Complete the table by filling in the missing information for each sensor.

Sensor Type	Power Requirement	Output Type	Real-World Application
Thermistor		Analog	_____control in ovens
Hall effect sensor	Active	Digital	Detecting _____ fields in door locks
Strain gauge			Monitoring _____in aircraft wings
LDR (photoresistor)		Analog	Measuring _____levels in automatic street lights
Capacitive sensor	Active		Touchscreen detection in _____-

Task 7. Read the text "Smart Parking Systems" and do the tasks.

Smart cities use sensors to solve everyday problems. One example is smart parking. In traditional parking, drivers waste time searching for empty spaces, which increases traffic and pollution. Smart parking systems use sensors to fix this problem.

Smart parking systems use two types of sensors: motion sensors and pressure sensors. Motion sensors detect when a car enters or leaves a parking space. Pressure sensors detect the weight of a parked car. When a car parks in a space, the pressure sensor sends a signal to a central system. The system displays available parking spaces on a mobile app. Drivers can see which spaces are empty and drive directly to them.

This simple technology saves time and reduces pollution. Drivers spend less time searching for parking. Less driving means less traffic and cleaner air. Smart parking systems also help city planners understand parking patterns and plan better transportation solutions.

However, smart parking systems have challenges. Installing sensors in every parking space is expensive. Sensors can fail in bad weather or when covered with dirt. Despite these challenges, many cities are adopting smart parking because the benefits outweigh the costs.

Read the statements and decide if they are True or False.

____ Smart parking systems use only motion sensors.

_____ Pressure sensors detect the weight of a parked car.

_____ Smart parking increases traffic and pollution.

_____ Drivers use a mobile app to find available parking spaces.

Choose the correct option (A-C).

1. What is the main problem that smart parking systems solve?

A. Parking is too cheap

B. There are too many cars in the city

C. Drivers waste time searching for empty spaces

2. What do motion sensors detect in smart parking?

A. The weight of a parked car

B. When a car enters or leaves a parking space

C. The color of the car

3. How does smart parking reduce pollution?

A. By making cars electric

B. By preventing all driving

C. By reducing the time drivers spend searching for parking

4. What signal does the pressure sensor send?

A. A signal to a central system

B. A sound alarm

C. A text message to the driver

5. What information does the mobile app show drivers?

A. The price of parking

B. Available parking spaces

C. The weather forecast