Basic Electrical Components



 Running represents resistance, the stop sign indicates opposition,
 electricity signifies electrical usage, and a brick wall represents blocking current.



a. A "cap" represents capacitor, a box represents charge storage, electricity indicates its function, and the circular arrows show charging and discharging cycles.



a. "ID" sounds like "Ind", a plow resembles coil windings, electricity shows its purpose, and the loop symbolizes inductance.



b. "Di" from dice, an arrow to indicate one-way direction, a plug to show electrical connectivity, and a bulb to represent electricity flow.



a. A light bulb shows illumination, electricity signifies operation, signal waves indicate emission, and a star represents brightness.



a. Fire represents overload protection, a link shows connection, a timer indicates reaction time, and a stop sign shows breaking the circuit.



a. A relay runner symbolizes relay switching, repeat arrows indicate switching behavior, electricity signifies electrical operation, and a speaker represents activation.



a. A house for "Rec", an arrow for DC conversion, a ruler for precision, and electricity to represent power supply.



a. Lifting weight shows power transformation, a car represents movement of energy, electricity is its core function, and a box represents the transformer casing.



a. A battery emoji directly represents it, electricity shows energy, time shows storage, and the recycle sign represents charging and discharging.



• A house (Sil), a game controller (Controlled), an arrow (Rectifier), and electricity.



• A camera (light), a train (Trans), electricity (power), and a cycle arrow (switching).

Electrical Machines



- Battery represents DC (Direct Current) supply.
- Car symbolizes motion (motors are used in vehicles).
- Rotating arrows indicate mechanical rotation.
- **Gear** represents mechanical components inside the motor.
- Explanation: A DC motor converts direct current (DC) electrical energy into mechanical motion using electromagnetic principles.



- **Electricity** represents power generation.
- Rotating arrows indicate the cyclic motion of an AC generator's rotor.
- **House** symbolizes power supply for homes.
- Gear represents mechanical components used to generate electricity.
- Explanation: An AC Generator (Alternator) converts mechanical energy into
 AC electricity using electromagnetic induction.

- Ruler/scale represents measurement and voltage regulation.
- **Up arrow** shows that voltage is increased.
- Lifting weight symbolizes an increase (stepping up voltage).
- **Electricity** represents electrical transformation.
- **Explanation:** A **Step-Up Transformer** increases voltage from the primary winding to the secondary winding while reducing current.

- **Brush symbol** represents brushes used in traditional motors.
- No sign means brushless (BLDC motors don't use brushes).
- Rotating arrows indicate mechanical rotation.
- Gear represents mechanical components in the motor.
- Explanation: A Brushless DC Motor (BLDC) uses electronic commutation instead of mechanical brushes, leading to higher efficiency and reliability.

16. Induction Motor - 🚜 + 🔄 + 🐡 + 🔸

- Plow represents industrial/agricultural use (induction motors are common in machines).
- Rotating arrows indicate rotor movement.
- **Gear** symbolizes the mechanical system inside the motor.
- **Electricity** represents power supply.
- Explanation: An Induction Motor operates using electromagnetic induction and is commonly used in industries due to its robustness and reliability.

- Microscope represents small-scale components.
- Chip (CD/DVD) represents a processing unit.
- Computer symbolizes computing power.
- Brain represents intelligence and processing capabilities.
- Explanation: A Microprocessor is a small, integrated circuit (IC) that processes instructions in electronic devices and computers.

18. Microcontroller - 🔬 + 🙉 + 🕂 + 🔙

- Microscope represents small size.
- Game controller symbolizes control functionalities.
- **Electricity** indicates electrical operations.
- **Computer** represents its use in embedded systems.
- **Explanation:** A **Microcontroller** is a small **computer on a single chip** that includes a processor, memory, and input/output peripherals.



- Nose symbolizes sensing capability.
- Signal waves represent data output.
- **Electricity** represents electronic sensors.
- **Knob** indicates adjustable measurement.
- **Explanation:** A **Sensor** detects changes in the environment (temperature, pressure, motion, etc.) and converts them into electrical signals.

Electrical and Electronics Engineering Subjects



- **Knob ₹** → Represents manual and automatic control.
- Cycle □ → Indicates feedback loops for system stability.
- **Electricity** → Represents electrical/electronic control.

Explanation:

Control systems manage and regulate the behavior of dynamic systems using **feedback mechanisms** (e.g., automatic temperature control in ACs or speed control in motors).



- Sun 😂 → Represents solar energy (solar panels).
- Wind · Symbolizes wind turbines generating electricity.
- **Electricity →** Clean energy output.

Explanation:

Renewable energy refers to **sustainable energy sources** (solar, wind, hydro, biomass) that reduce dependence on fossil fuels and **lower environmental impact**.

- **Gear** ♦ Represents mechanical movement in machines.
- **Rotation** ③ → Symbolizes the working principle of motors and generators.
- Electricity
 → Represents electrical input/output.

Explanation:

Electrical machines include **motors**, **generators**, **and transformers** that convert electrical energy into mechanical energy (motors) or vice versa (generators).

- **Binary 0/1** → Represents digital logic (ON/OFF states).
- **Switch** ≥ → Symbolizes switching operations in circuits.
- Logic Gates → The foundation of digital electronics.

• **Computer** ■ → Digital systems designed using logic circuits.

Explanation:

Switching Theory & Logic Design (STLD) focuses on digital circuits, Boolean algebra, and logic gates used in processors, memory devices, and automation systems.

- 24. Power Systems + + + + + +
 - **Electricity** → Represents power generation and transmission.
 - **Power Plant** $\stackrel{!}{\downarrow}_{l}$ → Produces electrical energy (thermal, hydro, nuclear, etc.).
 - **High Voltage Tower** → Transmits electricity over long distances.

Explanation:

Power systems focus on the **generation, transmission, and distribution** of electrical energy, ensuring **stable and reliable power supply** to consumers.