Chapter 8: Parts of Robots

1. Difference Between Humans and Robots

Feature	Humans	Robots
Intelligence	Natural (biological brain)	Artificial (programmed logic)
Movement	Controlled by muscles and brain	Controlled by motors and controllers
Learning Ability	Can learn and adapt over time	Learns with AI/machine learning (if programmed)
Emotions	Have feelings and emotions	Do not possess emotions
Energy Source	Food and oxygen	Electrical, hydraulic, or pneumatic power

2. Essential Parts of Robots

A robot is made up of several components that allow it to perform tasks, move, sense the environment, and make decisions.

1. Manipulator

- Acts like a robot's **arm**.
- Helps in moving, lifting, or controlling objects.

2. End Effector

- The **tool** attached to the manipulator (e.g., gripper, welding torch).
- Directly interacts with the environment.

3. Locomotion Device

- Enables robot movement from one place to another.
- **Types of Actuation**:
  - **Electric**: Uses motors.
  - **Hydraulic**: Uses pressurized fluids.
  - **Pneumatic**: Uses compressed air.

4. Controller

- The **brain** of the robot.
- Executes instructions and processes sensor input.
- May have:
  - **Simple Control**: For basic tasks.
  - **Strong Sensory Input**: For advanced tasks and decision-making.

5. Sensor

- Collects data from the environment (e.g., temperature, light, distance).
- Helps the robot to **sense and react** to surroundings.

6. Power Supply

- Provides energy required for functioning.
- Examples: **Battery**, **electric current**, **fuel cells**.