9th Class

➢ Physical Nature of Matter

The physical nature of matter refers to its fundamental characteristics and properties that can be observed or measured without undergoing a chemical change. These properties help describe and classify different types of matter. Here are some key aspects of the physical nature of matter:

❖ Mass:

- Amount of matter in an object.
- Measured in grams or kilograms.
- Conserved in physical processes.

❖ Volume:

- Space occupied by matter.
- Measured in cubic units.
- Influenced by temperature and pressure for gases.

❖ Density:

- Mass per unit volume.
- Calculated as Density = Mass/Volume.
- Characteristic property aiding substance identification.

❖ Shape:

- Matter exists in various shapes: solid, liquid, gas.
- Determined by particle arrangement.

❖ States of Matter:

- Solid: Definite shape and volume.
- Liquid: Definite volume, no definite shape.
- Gas: No definite shape or volume.

- Plasma, Bose-Einstein Condensate, and Fermionic Condensate under unique conditions.

❖ **Temperature:**

- Measure of average kinetic energy of particles.
- Influences state of matter and reaction rates.

❖ **Conductivity:**

- Ability to conduct electricity or heat.
- Metals are good conductors.

❖ **Magnetic Properties:**

- Attraction or repulsion to magnets.
- Depends on atomic and electron arrangement.

❖ **Solubility:**

- Ability to dissolve in a solvent.
- Often temperature-dependent.

❖ **Elasticity and Plasticity:** - Solids exhibit elasticity (return to original shape) or plasticity (permanent deformation).