

3. THERMAL PHYSICS

Learning Objectives

At the end of this lesson, students will be able to

- ❖ Understand the concept of heat and temperature
- ❖ Know the absolute scale of temperature
- ❖ Understand the thermal energy and the thermal equilibrium
- ❖ Classification of expansion of substances
- ❖ Know the fundamental laws of gases
- ❖ Distinguish between real gas and ideal gas
- ❖ Derive the ideal gas equation
- ❖ Solve the numerical problems

Important Notes and Results:

Though the SI unit of heat energy is joule, there are some other commonly used units.

- **Calorie:** *One calorie is defined as the amount of heat energy required to rise the temperature of 1 gram of water through 1°C.*
- **Kilocalorie:** *One kilocalorie is defined as the amount of heat energy required to rise the temperature of 1 kilogram of water through 1°C.*
- Coefficient of cubical expansion of some materials

S.No.	Name of the material	Coefficient of cubic expansion (K^{-1})
1	Aluminium	7×10^{-5}
2	Brass	6×10^{-5}
3	Glass	2.5×10^{-5}
4	Water	20.7×10^{-5}
5	Mercury	18.2×10^{-5}