

# **Summary :**

## **1. Basics of Thermodynamics**

- Definition of thermodynamics
- Types of systems (open, closed, isolated)
- Thermodynamic properties and equilibrium
- Zeroth law of thermodynamics
- Temperature, pressure, specific volume
- Reversible and irreversible processes
- Energy, work, and heat

## **2. First Law of Thermodynamics**

- Conservation of energy principle
- Internal energy and enthalpy
- Applications to closed and open systems
- Flow energy and steady flow processes

## **3. Second Law of Thermodynamics**

- Limitations of the first law
- Heat engines and refrigerators
- Carnot cycle
- Entropy and its physical meaning
- Clausius inequality

## **4. Steam and Boilers**

- Properties of steam
- Boilers: types and working principles
- Boiler performance and efficiency
- Draught systems
- Condensers and steam cycles

## **5. Steam Turbines and Power Plants**

- Working of steam turbines
- Rankine cycle
- Power plant layout and efficiency improvements

## **6. Internal Combustion Engines (I.C. Engines)**

- Types of engines (SI and CI engines)
- Working cycles (Otto and Diesel cycles)
- Engine performance parameters
- Fuel systems and combustion

## **7. Gas Power Cycles and Gas Turbines**

- Air standard cycles
- Brayton cycle
- Gas turbine working and applications

## **8. Transmission of Power**

- Belts, ropes, chains
- Gear trains
- Power transmission efficiency

## **9. Clutches, Brakes and Dynamometers**

- Types and working principles
- Energy dissipation in braking systems
- Measurement of power

## **10. Engineering Mechanics Basics**

- Centre of gravity and centroid
- Moment of inertia
- Simple stresses and strains
- Principal stresses

## **11. Heat Transfer (in some editions)**

- Modes of heat transfer
- Conduction, convection, radiation
- Heat transfer through walls and cylinders

## **12. Machine Tools and Manufacturing Basics**

- Casting, welding, machining
- Basic manufacturing processes
- ou une **fiche de révision chapitre par chapitre**
- ou même des **questions probables d'examen** 👍