

2.16 30314 THEORY OF MECHANICAL ENGINEERING

UNIT-1 MECHANICAL PROPERTIES OF METALS:

1.1 Definitions

- 1.1.1 Elasticity
- 1.1.2 Plasticity
- 1.1.3 Ductility
- 1.1.4 Brittleness
- 1.1.5 Toughness
- 1.1.6 Hardness
- 1.1.7 Malleability
- 1.1.8 Fatigue

1.2 Examples of applications of above terms related to electrical engineering.

UNIT-2 BASIC CONCEPT OF THERMAL ENGINEERING:

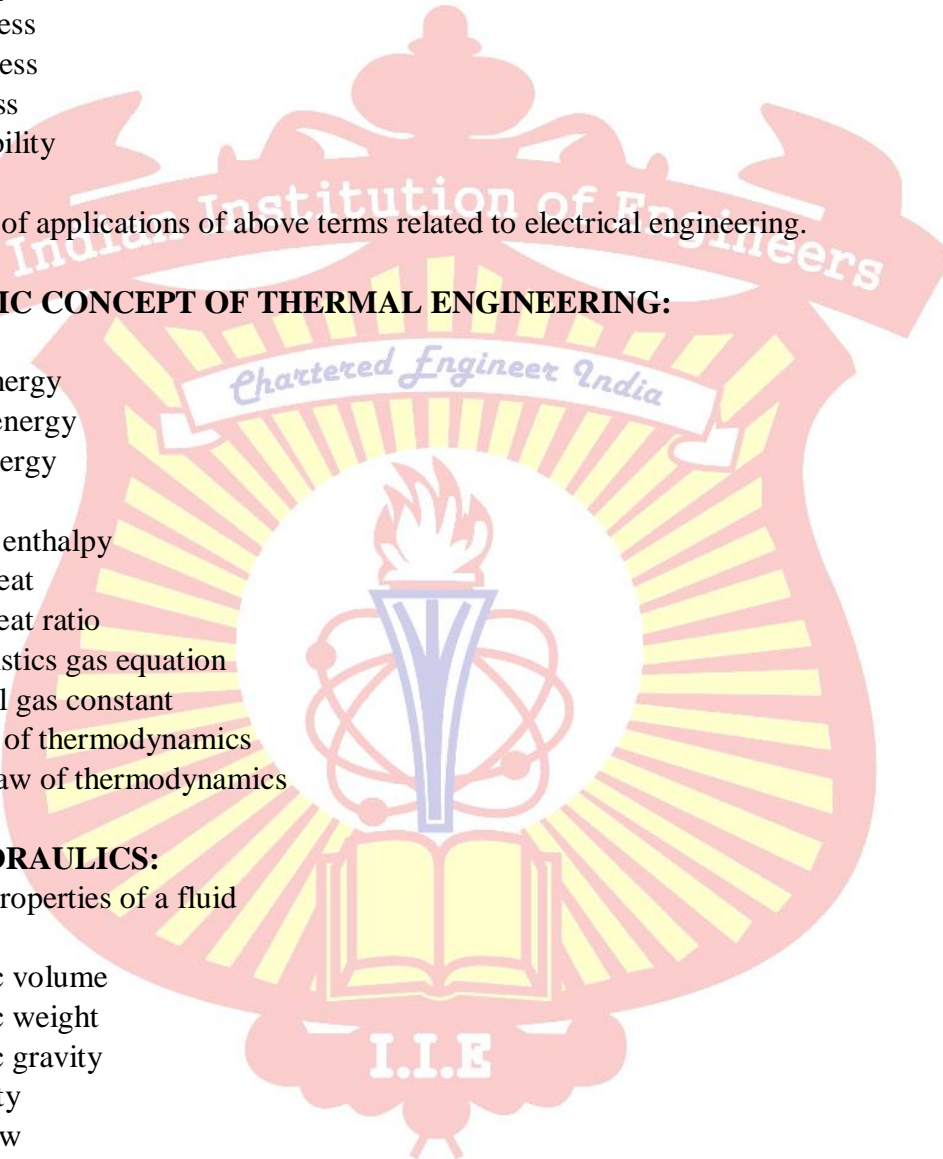
- 2.1 Energy
- 2.2 Internal energy
- 2.3 Potential energy
- 2.4 Kinetic energy
- 2.5 Heat
- 2.6 Work and enthalpy
- 2.7 Specific heat
- 2.8 Specific heat ratio
- 2.9 Characteristics gas equation
- 2.10 Universal gas constant
- 2.11 First law of thermodynamics
- 2.12 Second law of thermodynamics

UNIT-3 HYDRAULICS:

- 3.1 Physical properties of a fluid
 - 3.1.1 Density
 - 3.1.2 Specific volume
 - 3.1.3 Specific weight
 - 3.1.4 Specific gravity
 - 3.1.5 Viscosity
- 3.2 Pascal's law

UNIT-4 PRESSURE MEASURING DEVICES:

- 4.1 Manometers
 - 4.1.1 Simple manometers
 - 4.1.2 Differential manometers
 - 4.1.3 Inverted 'U' tube
- 4.2 Pressure gauges



4.3 Continuity equation

UNIT-5 BERNAULLI'S THEOREM:

5.1 Energy of a fluid

5.1.1 Pressure energy

5.1.2 Velocity energy

5.1.3 Datum energy

5.2 Venturimeter & its uses

UNIT-6 PUMPS:

6.1 Types of pumps

6.2 Centrifugal pump

6.3 Reciprocating pump

6.4 Their relative advantages and performance

UNIT-7 TURBINE:

7.1 Working principles and types of water turbines

7.2 Selection of turbines

7.3 Brief idea of turbine

7.3.1 Pelton wheel turbine

7.3.2 Francis turbine

UNIT-8 PROPERTIES OF STEAM:

8.1 Generation of steam at constant pressure

8.2 Enthalpy of water wet steam

8.3 Enthalpy of dry saturated steam

8.4 Dryness fraction

8.5 Superheated steam

8.6 Latent enthalpy

8.7 Enthalpy of steam

8.8 Specific volume

8.7 External work during evaporation

8.8 Internal content enthalpy

8.9 Internal energy of steam

8.10 Use of steam table

8.11 Simple numerical problems

UNIT-9 BOILERS:

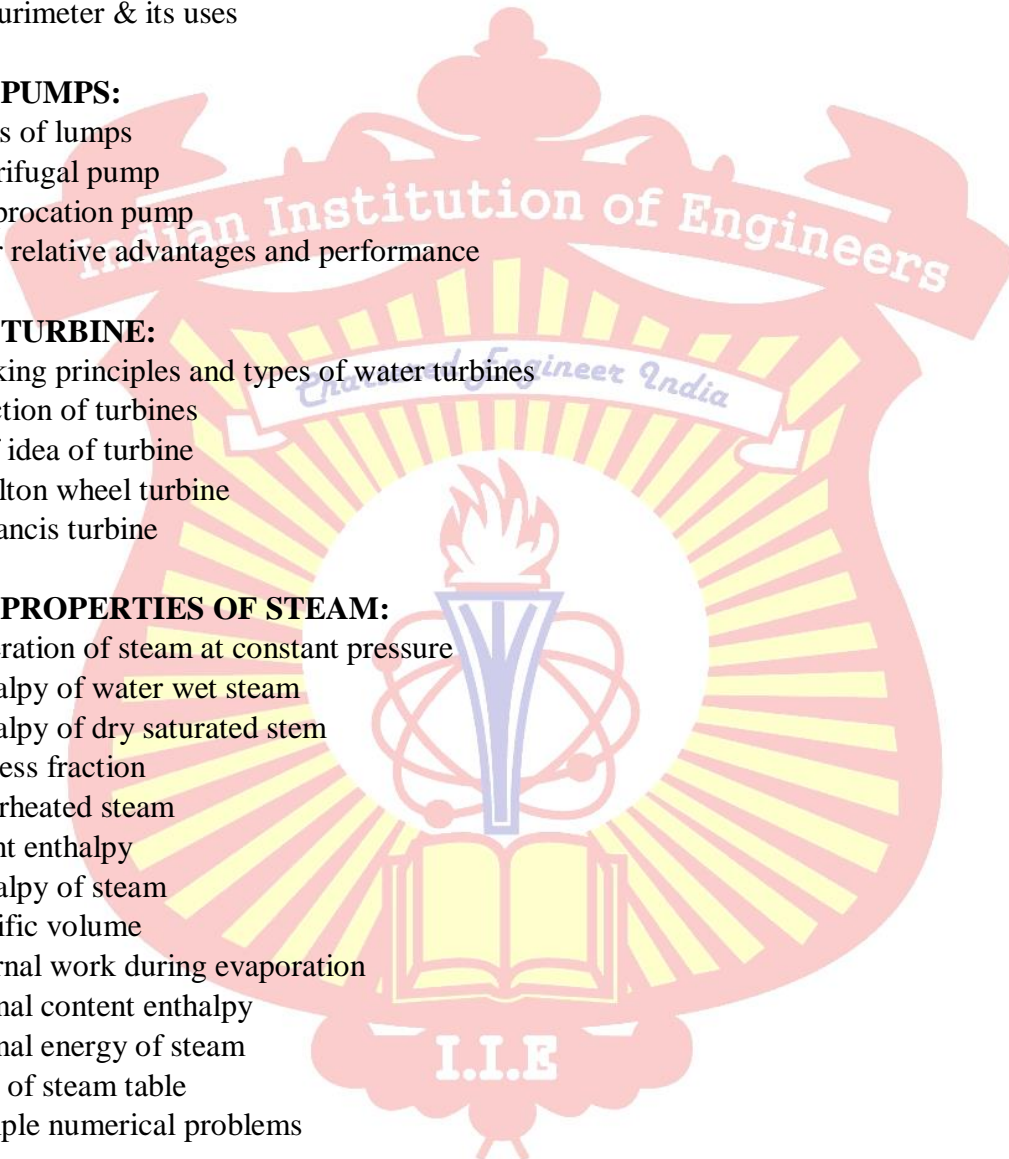
9.1 Classification of boilers

9.2 Working of common boilers

9.2.1 Babcox and Wilcox

9.2.2 Chichram boiler

9.3 Boiler mounting and their accessories



9.4 Introduction to modern high pressure boiler for thermal power station (Lamont boiler, weffler boiler, Benson boiler and Velox boiler).

UNIT-10 STEAM TURBINES:

- 10.1 Introduction
- 10.2 Types of steam turbine
- 10.3 Working principle of steam turbine
- 10.4 Uses and advantages of steam turbine

UNIT-11 I.C. ENGINES:

- 11.1 I.C. engine cycle (otto, diesel)
- 11.2 Working principle of
 - 11.2.1 Two stroke petrol and diesel
 - 11.2.2 Four stroke petrol and diesel

UNIT-12 TRANSMISSION:

- 12.1 Belt drive
- 12.2 Rope drive
- 12.3 velocity ratio
- 12.4 Tension ratio
- 12.5 Effect of centrifugal tension
- 12.6 Application of these drives

UNIT-13 LUBRICATION:

- 13.1 Object of lubrication
- 13.2 Different methods of lubrication
- 13.3 Properties of lubricants

Reference Books:

1. Thermodynamics & Heat Power Engg. Mathur & Mehta
2. Thermal Engg. P.L. Ballaney
3. Hydraulics & Hyd. Machines Khurmi
4. Strength of Materials G.C.Singh
5. Heat Engines Pande & Shah

