

AMEE02 THERMAL & HYDRAULIC MACHINES

UNIT-1 THERMODYNAMIC EQUILIBRIUM

- 1.1 Cyclic process, enthalpy,
- 1.2 Zero, first and second laws of thermodynamics, Carnot cycle,
- 1.3 Concept of entropy, properties of steam,
- 1.4 Processes involving steam in closed and open systems, Enthalpy.
- 1.5 Vapour Pressure Cycles
- 1.6 Rankine cycle, reheat cycle,
- 1.7 Regenerative cycle

UNIT-2 STEAM

- 2.1 Turbine: Classification, impulse and reaction turbines their velocity diagrams and related calculations, work done and efficiencies, re-heat factor, staging,
- 2.2 Bleeding and governing of turbines.
- 2.3 Gas Turbine: Classification,
- 2.4 Brayton cycle, working principle of gas turbine,
- 2.5 Gas turbine cycle with intercooling, reheat and regeneration,
- 2.6 Stage and polytropic efficiencies.

UNIT-3 COMPRESSORS

- 3.1 Classification, single and multistage reciprocating compressors, isothermal and volumetric efficiencies, centrifugal and axial flow compressors, surging, choking and stalling.
- 3.2 I.C. Engines: Otto, Diesel and Dual cycles,
- 3.3 Introduction to 2-stroke and 4-stroke SI and CI engines, indicator diagram and power measurement.

UNIT-4 IMPACT OF JET

- 4.1 Introduction to hydrodynamic thrust of jet on a fixed and moving surface (flat and curve), effect of inclination of jet with the surface.
- 4.2 Hydraulic Turbines: Classification, heads and efficiencies, construction,
- 4.3 Working, work done and efficiency of impulse and reaction turbines.

UNIT-5 CENTRIFUGAL PUMP

- 5.1 Classification, construction, working, work-done,
- 5.2 Efficiencies, cavitation and priming; jet pump
- 5.3 Reciprocating Pump: Classification, construction, working, work-done, slip and coefficient of discharge.

Reference Books:

1. P.L. Ballany “Thermal Engineering” Khanna Publishers, 2003
2. R.K. Bansal “A Text Book of Fluid Mechanics and Hydraulic Machines” Laxmi Publications, 2006.