AMSB03 THERMODYNAMICS

UNIT-1 COMBUSTION OF FUEL

1.1 Introduction, Mass fraction and Mole Fraction, Symbols for Elements and Compounds,

1.2 Combustion Equations of Gaseous Fuels, Theoretical or Minimum Mass of Air Required for Complete Combustion,

1.3 Theoretical or Minimum Volume of Air required for Complete Combustion, Excess Air Supplied, Air Fuel ratio, Analysis of products of combustion, Combustion Equations,

1.4 Volumetric analysis of products, Conversion of volumetric analysis to gravimetric analysis, Volume Fraction,

1.5 Conversion of volumetric Analysis into Mass Analysis or Gravimetric Analysis,

1.6 Conversion of Mass Analysis into Volumetric Analysis, Mass of Carbon in Fuel Gases, The analysis of Fuel Gas, The Orsat Apparatus.

UNIT-2 ENTROPY

2.3 Introduction, Entropy as a property, The Second Law, Analysis for Entropy, Clausius Inequality, Change of entropy in an irreversible process,

2.4 Change of Entropy for Ideal Gas and Pure Substance,

2.5 Change of Entropy of a perfect gas during Various Thermodynamics Processes, Change of Entropy during Constant Process (or Isobaric Process),

2.6 Change of Entropy during Constant Temperature Process (or Isothermal process), Change of Entropy during

2.7 Reversible Adiabatic Process (or Isentropic Process), Change of Entropy during Plytropic Process (pv^n = Constant).

UNIT-3 AIR COMPRESSOR

3.1 Introduction, Uses of Compressed air for industries, Types of Air Compressors, Capacity Control of Compressor,

3.2 Types of compressor valves, Work done by Reciprocating Air Compressor with Clearance Volume,

3.3 Effect of Clearance on volumetric efficiency,

3.4 Condition for maximum efficiency in two stage compression with intercooling.

UNIT-4 IC ENGINE

4.1 Introduction, Classification of I.C. Engines, Fuel Supply System for S.I. and C.I. Engine, Ignition Systems of Petrol Engines,

4.2 Fuel Injection system for Diesel Engines, Cooling Systems for I.C. Engines, Lubrication System for I.C. Engines,

4.3 Governing of internal combustion engines, Main Components of I.C. Engines,

4.4 Reciprocating Internal Combustion Engines, Four-Stroke cycle, Two-stroke cycle.

UNIT-5 IC ENGINE TESTING & PERFORMANCE

5.1 Indicated Power, Measurement of friction power, Indicated mean Effective Pressure,

5.2 Measurement of fuel consumption, Energy balance of an I.C. Engine,
5.3 Determination of mechanical, Thermal and Relative efficiency.

UNIT-6 STEAM PROCESS

6.1 Introduction, Thermodynamics Processes of Vapour, Enthalpy – Entropy or H-S Chart or Mollier Diagram,
6.2 Measurement of dryness-fraction of steam, Bucket or Barrel Calorimeter,
6.3 BOILER, Introduction, Classification of Boilers, Boiler Mountings and Accessories,
6.4 Equivalent Evaporation, Boiler Efficiency, Heat Losses in a Boiler, Heat Balance Sheet, Boiler Draught.

UNIT-7 VAPOUR POWER CYCLE

7.1 Introduction, The Carnot cycle, the ideal Rankine Cycle,
7.2 Factors affecting the performance of Rankine cycle.

UNIT-8 AIR STANDARD CYCLE

8.1 Introduction, Otto Cycle, Diesel Cycle, Dual Combustion Cycle,
8.2 Comparison of Otto, Diesel Dual Cycle,
8.3 Air and Fuel-vapour mixtures Concept of air fuel Cycle.

Reference Books:

1. Engineering Thermodynamics by M Achuthan
2. Thermodynamics: Kinetic Theory and Statistical Thermodynamics by F W Sears and G L Salinger
3. Fundamentals of Engineering Thermodynamics by M J Moran and H N Shapiro.