Sub Code	
: 06 ME 43	
IA Marks	
: 25	
Hrs/week	
: 04	
Exam Hours	
: 03	
Total Lecture	**Hrs**

: 52

Exam Marks

: 100

PART – A

UNIT 1:□□□□□□□□□□□□□□□□

Combustion thermodynamics: Theoretical (Stoichiometric) air for combustion of fuels. Exce ss air, mass balance, actual combustion.

Exhaust gas analysis.

A/F ratio.

Energy balance for a chemical reaction, enthalpy of formation, enthalpy and internal energy of combustion.

Combustion efficiency.

7 Hours

UNIT 2:□□□□□□□□□□□□□□□□

Gas Power Cycles: Air standard cycles; Carnot, Otto, Diesel, Dual and Stirling cycles, P-v and T-s diagrams, description, efficiencies and mean effective pressures. Comparison of Otto and

Diesel cycles.

6 Hours

UNIT 3:□□□□□□□□□□□□□□□□

Gas turbines and Jet Propulsion: Classification of Gas Turbines, Analysis of open cycle gas turbine cycle. Advantages and Disadvantages of closed cycle. Methods to improve thermal efficiency. Jet propulsion and Rocket propulsion.

6 Hours

UNIT 4:□□□□□□□□□□□□□□□□

Vapour Power Cycles: -Carnot vapour power cycle, drawbacks as a reference cycle. Simple Rankine cycle; description, T – s diagram, analysis for performance. Comparison of Carnot and Rankine cycles. Effects of pressure and temperature on Rankine cycle performance.

Actual vapour power cycles. Ideal and practical regenerative Rankine cycles, open and closed

feed water heaters. Reheat Rankine cycle.

7 Hours

PART – B

UNIT 5:□□□□□□□□□□□□□□□□

Reciprocating Compressors: - Operation of a single stage reciprocating compressors. Work input through P – v diagram and steady state steady flow analysis. Effect of clearance and volumetric efficiency. Adiabatic, isothermal and mechanical efficiencies. Multi-stage compressor, Saving in work, optimum intermediate pressure, inter-cooling, minimum work for compression.

7 Hours

UNIT 6:□□□□□□□□□□□□□□□□

Refrigeration: -Vapour compression refrigeration system; description, analysis, refrigerating effect, capacity, power required, units of refrigeration, COP. Refrigerants and their desirable properties. Air cycle refrigeration; reversed Carnot cycle, reversed Brayton cycle. Vapour absorption refrigeration system. Steam jet refrigeration.

7 Hours

UNIT 7:

Psychrometrics: - Atmospheric air and psychrometric properties; Dry bulb temperature, wet bulb temperature, dew point temperature; partial pressures, specific and relative humidifies and the relation between the two Enthalpy and adiabatic saturation temperature. Construction and Use of psychrometric chart. Analysis of various processes; heating, cooling, dehumidifying and humidifying. Adiabatic mixing of stream of moist air. Summer and winter air - conditioning.

6 Hours

UNIT 8:

I.C. Engines: Testing of two-stroke and four-stroke SI and CI engines for performance, related numerical problems, heat balance, Morse test.

6 Hours

Text Books:

1. **Basic and Applied Thermodynamics** by P.K.Nag, Tata McGraw Hill Pub. Co., 2002.

2. **Fundamental of Classical Thermodynamics** by G.J. Van Wylen and R.E.Sonntag, Wiley Eastern.

Reference Books:

1. **Thermodynamics -An Engineering Approach** by Yunus, A.Cenegal and Michael A.Boles, Tata McGraw Hill Pub. Co., 2002

2. **Applied Thermodynamics** by R.K.Hegde and Niranjan Murthy, Sapna Book House, 2005.

Scheme of Examination:

One Question to be set from each chapter. Students have to answer any FIVE full questions out of EIGHT questions, choosing at least 2 questions from part A and 2 questions from part B.