10 ME 312 APPLIED THERMODYNAMICS – II (SI UNITS)

III B.Tech I Semester

(with effect from the academic year 2012-2013)

Credits: 4

Lectures/week: 4 Hrs *Sessional Marks: 40*

University Exam:3 Hrs *End Examination Marks: 60*

UNIT-I

Reciprocating Compressors

Mechanical details – Methods of compression – shaft work and isothermal efficiency of a single stage compressor indicator diagram – effect of clearance – volumetric efficiency – losses during compression – multistage compression optimum pressure condition in two stage compression inter coolers and after coolers

UNIT - II

Rotary Compressors

Classification – positive displacement and rotary dynamic (non-positive displacement) compressors – fans – blowers and compressors – static and total head – centrifugal compressors velocity diagrams – type of impeller vanes – slip factor – diffuser isentropic efficiency – axial flow compressors – velocity diagrams – degree of reaction – isentropic efficiency

UNIT – III

Gas Turbines & Jet propulsions

Simple gas turbine cycle - open and closed cycle - constant volume cycle — constant pressure cycle – efficiency and work output – cycle with inter coolers – reheat and regeneration cycles, losses in a turbine

Jet Propulsion

Specific thrust – thermal efficiency and propulsion efficiency turbo prop – turbo jet – rocket propulsion – performance evaluation

UNIT – IV

Refrigeration

Performance and capacity of refrigeration – refrigeration cycles – vapour compression cycles – properties of common refrigerants – vapour absorption cycles

UNIT – V

Air Conditioning

Psychometry – psychometric chart – psychometric process, effective temperature - principles of air conditioning – bypass factor – simple systems for winter and summer air conditioning

TEXT BOOKS:

1. Heat Engineering : Vasandani V P and Kumar D S
2. Heat Engines : Ballaney P L

REFERENCE BOOKS:

1. Applied Thermodynamics : Eastop and Mckankey
2. Engineering Thermodynamics : Nag P K
3. Cryogenic Engineering : Russel B Scott