

REFRIGERATION AND AIR CONDITIONING

Sub Code	: 10ME 663	IA Marks	: 25
Hrs/week	: 04	Exam Hours	: 03
Total Lecture Hrs	: 52	Exam Marks	: 100

PART - A

UNIT - 1

Methods Of Refrigeration: Ice refrigeration, evaporative refrigeration, air refrigeration, vapour refrigeration, dry ice refrigeration, thermo electric refrigeration, pulse tube refrigeration, thermoacoustic refrigeration.

06 Hours

UNIT - 2

Gas Cycle Refrigeration: Introduction , reverse Carnot cycle, Bell Coleman cycle, advantages & dis-advantages of gas refrigeration system. Applications to aircraft refrigeration, Analysis of gas refrigeration and Numericals.

06 Hours

UNIT - 3

Multi Pressure Vapour Compression Systems: Multi stage compression, Multi evaporator systems, Cascade systems, calculation, production of solid carbon dioxide, System practices for multistage system.

07 Hours

UNIT - 4

Refrigerants: Types of Refrigerants, Comparative study of Ethane and Methane derivatives, selection of Refrigerants, Requirements of Refrigerants, Effects of lubricants in Refrigerants, substitutes of CFC Refrigerants, Mixture Refrigerants-azeotropic mixtures

07 Hours

PART - B

UNIT - 5


Equipments Used In Vapour Compression Refrigeration System: Compressors: Principle, types of compressors, capacity control. Condensers: Types and construction, Expansion devices: Types- Automatic expansion valve, Thermostatic expansion valves, capillary tube. Sizing Evaporator: Types & construction.

06 Hours

UNIT - 6

Vapour Absorption System: Common refrigerant absorbent combinations, Binary mixtures, Ammonia Water Absorption system, Actual vapour absorption cycle and its representation on enthalpy. composition diagram, calculations. Triple fluid vapour absorption refrigeration system. Water - Lithium Bromide absorption chiller.

07 Hours


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UNIT - 7

Design Conditions: Outside design conditions, choice of inside conditions, comfort chart, Choice of supply design condition.

Load Calculations And Applied Psychometrics: Internal heat gains, system heat gains, break up of ventilation load and effective sensible heat factor, Bypass factor, cooling load estimate. Psychometric calculations for cooling. Selection of Air conditioning apparatus for cooling and dehumidification, evaporative cooling.

07 Hours

UNIT - 8

Transmission And Distribution Of Air: Room Air Distribution, Friction loss in ducts, dynamic losses in ducts, Air flow through simple Duct system, Duct design.

Controls In Refrigeration And Air Conditioning Equipments: High pressure and low pressure cut out, thermostats, pilot operated solenoid valve, motor controls, bypass control-Damper motor. VAV controls.


06 Hours

TEXT BOOKS:

1. 'Refrigeration and Air-Conditioning' C. P. Arora, Tata McGraw Hill Publication, 2nd edition, 2001.
2. 'Refrigeration and Air-Conditioning' W. F. Stoecker, Tata McGraw Hill Publication, 2nd edition, 1982.
3. ASHRAE, Hand Book, 2009

REFERENCE BOOKS:

1. 'Principles of Refrigeration' Dossat, Pearson-2006.
2. 'Heating, Ventilation and Air Conditioning', McQuiston, Wiley Students edition, 5th edition 2000.
3. 'Air conditioning' PITA, 4th edition, pearson-2005
4. 'Refrigeration and Air-Conditioning' Manohar prasad
5. 'Refrigeration and Air-Conditioning' S C Arora & S Domkundwar, Dhanpat Rai Publication


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