23-24 5TH

GOVERNMENT POLYTECHNIC, KORAPUT

DEPARTMENT OF MECHANICAL ENGINEERING

Discipline: MECHANICAL ENGG	Semester: 5TH	Name of the Teaching Faculty: MANORAMA SAHABU.
Subject: REFRIGERATION AND AIR CONDITIONING	No. of days/per week class allotted: 04	Semester From date: 01/08/23 To Date: 30/11/23 No. of Weeks: 15

COURSE OUTCOMES

CO1. Explain the working of open & closed air system of air refrigeration system
CO2. Describe the working and construction of compressor, Condenser, evaporator, expansion valve used for air conditioning and refrigeration.
CO3. Explain Vapor Compression refrigeration system.
CO4. Explain Vapor Absorption refrigeration system.
CO5. Compare different refrigerants properties.
CO6. Describe equipment for air conditioning.
CO7. Explain the cooling load for the given requirement.

WEEK	CLASS DAY	THEORY TOPIC
1ST	1	**1. AIR REFRIGERATION CYCLE** Definition of refrigeration and unit of refrigeration
	2	Definition of COP, Refrigerating effect (R.E)
	3	Principle of working of open and closed air system of refrigeration
	4	Calculation of COP of Bell-Coleman cycle
2ND	1	Numerical on it
	2	**2. SIMPLE VAPOUR COMPRESSION REFRIGERATION SYSTEM**
	3	Schematic diagram of simple vapors compression refrigeration system
	4	Types Cycle with dry saturated vapors after compression
3RD	1	Cycle with wet vapors after compression
	2	Cycle with superheated vapors after compression
	3	Cycle with superheated vapors before compression
	4	Cycle with sub cooling of refrigerant
4TH	1	Representation of above cycle on temperature entropy and pressure enthalpy diagram
	2	Numerical on above (determination of COP, mass flow)
	3	Numerical on above (determination of COP, mass flow)
	4	**3. VAPOUR ABSORPTION REFRIGERATION SYSTEM**
5TH	1	Simple vapor absorption refrigeration system
	2	Simple vapor absorption refrigeration system
	3	Practical vapor absorption refrigeration system
	4	Practical vapor absorption refrigeration system
6TH	1	COP of an ideal vapor absorption refrigeration system
	2	Numerical on COP

	3	**4. REFRIGERATION EQUIPMENTS** REFRIGERANT COMPRESSORS Principle of working and constructional details of reciprocating and rotary compressors
	4	Centrifugal compressor only theory Important terms.
7TH	1	Hermetically and semi hermetically sealed compressor.
	2	CONDENSERS Principle of working and constructional details of air cooled and water cooled condenser
	3	Heat rejection ratio
	4	Cooling tower and spray pond
8TH	1	EVAPORATORS Principle of working and constructional details of an evaporator
	2	Types of evaporator Bare tube coil evaporator, finned evaporator, shell and tube evaporator
	3	**5.REFRIGERANT FLOW CONTROLS, REFRIGERANTS & APPLICATION OF REFRIGERANTS** EXPANSION VALVES Capillary tube
	4	Automatic expansion valve Thermostatic expansion valve
9TH	1	REFRIGERANTS Classification of refrigerants
	2	Desirable properties of an ideal refrigerant
	3	Designation of refrigerant
	4	Thermodynamic Properties of Refrigerants
10TH	1	Chemical properties of refrigerants. Commonly used refrigerants, R-11, R-12, R-22, R-134a. R-717
	2	Commonly used refrigerants, R-11, R-12, R-22, R-134a. R-717 5.27 Substitute for CFC
	3	Applications of refrigeration Cold storage Dairy refrigeration
	4	Ice plant Water cooler Frost free refrigerator
11TH	1	**6.PSYCHOMETRICS &COMFORT AIR CONDITIONING SYSTEMS** Psychometric terms
	2	Adiabatic saturation of air by evaporation of water
	3	Psychometric chart and uses Psychometric processes
	4	Sensible heating and Cooling
12TH	1	Cooling and Dehumidification Heating and Humidification
	2	Adiabatic cooling with humidification
	3	Total heating of a cooling process
	4	SHF, BPF Adiabatic mixing
13TH	1	Problems on above
	2	Effective temperature and Comfort chart

	3	**7. AIR CONDITIONING SYSTEMS** Introduction
	4	Factors affecting comfort air conditioning
14TH	1	Equipment used in an air-conditioning
	2	Equipment used in an air-conditioning
	3	Classification of air-conditioning system
	4	Classification of air-conditioning system
15TH	1	Winter Air Conditioning System
	2	Summer air-conditioning system
	3	Numerical on above
	4	REVISION Class

LEARNING RESOURCES:

01. C.P Arrora Refrigeration And Air Conditioning Tmh

02. R.S.Khurmi &J.K.Gopta Refrigeration And Air Conditioning S.Chand

03. P.L Ballany Refrigeration And Air Conditioning Khanna Publisher

04. Domkundra And Arora Refrigeration And Air Conditioning Dhanpat Ray And Sons

04/8/23

Sign.of the Faculty concerned

04/8/23

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