

BLACK DIAMOND SCHOOL OF ENGINEERING, JHARSUGUDA

LESSON PLAN

Session (2022-2023)

Discipline: Mechanical Engg.	Semester: 5 th , Winter/2022	Name of the Faculty: Basudev Mishra Lecturer
Subject: Refrigeration and Air Conditioning	No of Days/week: 04	Start Date: 14/09/2022 End Date: 21/01/2023

Week	Class Day	Theory Topics
1st	1 st	Concept of refrigeration and unit of refrigeration.
	2 nd	Definition of COP, Refrigerating effect (R.E)
	3 rd	Principle of working of open and closed air system of refrigeration.
	4th	Calculation of COP of Bell-Coleman cycle and Problem Solving.
2nd	1 st	Schematic diagram of simple vapors compression refrigeration system
	2 nd	Cycle with dry saturated vapors after compression
	3 rd	Cycle with wet vapors after compression.
	4th	Cycle with superheated vapors after compression.
3rd	1 st	Cycle with superheated vapors before compression
	2 nd	Cycle with sub cooling of refrigerant
	3 rd	Representation of above cycle on temperature entropy and pressure enthalpy diagram. Problem solving (determination of COP, mass flow)
	4th	Practice Test/Assignment

Week	Class Day	Theory Topics
4th	1 st	Working principle of Simple vapor absorption refrigeration system
	2 nd	Working principle of Practical vapor absorption refrigeration system
	3 rd	COP of an ideal vapor absorption refrigeration system Problem solving on COP
	4th	Refrigerant compressors, Working Principle of working and constructional details of reciprocating and rotary compressors.
5th	1 st	Centrifugal compressor, Hermetically and semi hermetically sealed compressor.
	2 nd	Principle of working and constructional details of air cooled and water cooled condenser.
	3 rd	Heat rejection ratio. Cooling tower and spray pond
	4th	Class Test/Assignment
6th	1 st	Recap/Summerize
	2 nd	Principle of working and constructional details of an evaporator.
	3 rd	Types of evaporator. Bare tube coil evaporator.
	4th	Finned evaporator, shell and tube evaporator.
7th	1 st	Function of expansion valves Working of Capillary tube
	2 nd	Working principle of Automatic expansion valve
	3 rd	Working principle of Thermostatic expansion valve
	4th	Recap/Summerize
8th	1 st	Classification of refrigerants
	2 nd	Desirable properties of an ideal refrigerant.
	3 rd	Designation of refrigerant.
	4th	Thermodynamic Properties of Refrigerants.
9th	1 st	Chemical properties of refrigerants.
	2 nd	Commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717
	3 rd	Applications of refrigeration
	4th	Class Test/Assignment

Week	Class Day	Theory Topics
10th	1 st	Recap/Summerize
	2 nd	Working details of cold storage
	3 rd	Substitute for CFC
	4 th	Ice plant and dairy refrigeration
11th	1 st	Working principle of water cooler
	2 nd	Recap/Summerize
	3 rd	Discussion about frost free refrigerator.
	4 th	Psychometric terms
12th	1 st	Adiabatic saturation of air by evaporation of water.
	2 nd	Class Test/Assignment
	3 rd	Recap/Summerize
	4 th	Psychometric chart and uses.
13th	1 st	Psychometric processes
	2 nd	Sensible heating and Cooling
	3 rd	Cooling and Dehumidification
	4 th	Heating and Humidification
14th	1 st	Adiabatic cooling with humidification, Total heating of a cooling process SHF, BPF,
	2 nd	Adiabatic mixing, Problem solving.
	3 rd	Effective temperature and Comfort chart.
	5 th	Factors affecting comfort air conditioning. Equipment used in an air-conditioning.
	1 st	Classification of air-conditioning system, Winter Air Conditioning System
	2 nd	Summer air-conditioning system. Numerical on above

15th	3 rd	Revision and Question discussion
	4th	Revision and Question discussion.