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| **Discipline: MECHANICAL** | **Semester: 5th** | **Name of the Teaching Faculty: ER. LITU BEHERA**  **Lecturer Mechanical** |
| **Subject:**  **REFRIGERATION AND AIR CONDITIONING** | **No. of days/per week class allotted:**  **4** | **Semester From date: 01/07/2024**  **To date:08/11/2024**  **No of weeks: 15** |
| **Week** | **Class Day** | **Theory Topics:** |
| **1st** | **1st** | AIR REFRIGERATION CYCLE. 1.1 Definition of refrigeration and unit of refrigeration. |
| **2nd** | 1.2 Definition of COP, Refrigerating effect (R.E ) |
| **3rd** | 1.3 Principle of working of open and closed air system of refrigeration. |
| **4th** | 1.3.1 Calculation of COP of Bell-Coleman cycle and numerical on it. |
| **2nd** | **1st** | SIMPLE VAPOUR COMPRESSION REFRIGERATION SYSTEM 2.1 schematic diagram of simple vapors compression refrigeration system’ |
| **2nd** | 2.2 Types 2.2.1 Cycle with dry saturated vapors after compression. 2.2.2 Cycle with wet vapors after compression. 2 |
| **3rd** | .2.3 Cycle with superheated vapors after compression. 2.2.4 Cycle with superheated vapors before compression. 2.2.5 Cycle with sub cooling of refrigerant |
| **4th** | 2.2.6 Representation of above cycle on temperature entropy and pressure enthalpy diagram 2.2.7 Numerical on above (determination of COP,mass flow) |
| **3rd** | **1st** | VAPOUR ABSORPTION REFRIGERATION SYSTEM 3.1 Simple vapor absorption refrigeration system |
| **2nd** | 3.2 Practical vapor absorption refrigeration system |
| **3rd** | 3.3 COP of an ideal vapor absorption refrigeration system 3.4.Numerical on COP |
| **4th** | Revision of Chapter-3 |
| **4th** | **1st** | Previous year question solutions |
| **2nd** | REFRIGERATION EQUIPMENTS 4.1 REFRIGERANT COMPRESSORS 4.1.1 Principle of working and constructional details of reciprocating and rotary compressors |
| **3rd** | 4.1.2 Centrifugal compressor only theory 4.1.3 Important terms. 4.1.4 Hermetically and semi hermetically sealed compressor. |
| **4th** | 4.2 CONDENSERS 4.2.1 Principle of working and constructional details of air cooled and water cooled condenser |
| **5th** | **1st** | 4.2.2 Heat rejection ratio. 4.2.3 Cooling tower and spray pond. 4.3 EVAPORATORS 1.6.1 Principle of working and constructional details of an evaporator. |
| **2nd** | 1.6.2 Types of evaporator. 1.6.3 Bare tube coil evaporator, finned evaporator, shell and tube evaporator. |
| **3rd** | Revision of Chapter-4 |
| **4th** | Previous year question solutions |

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| **6th** | **1st** | 5.1 EXPANSION VALVES 5.1.1 Capillary tube |
| **2nd** | 5.1.2 Automatic expansion valve |
| **3rd** | 5.1.3 Thermostatic expansion valve 5.2 REFRIGERANTS |
| **4th** | 5.2.1 Classification of refrigerants |
| **7th** | **1st** | 5.2.2 Desirable properties of an ideal refrigerant. |
| **2nd** | 5.2.3 Designation of refrigerant. |
| **3rd** | 5.2.4 Thermodynamic Properties of Refrigerants. |
| **4th** | 5.2.5 Chemical properties of refrigerants. |
| **8th** | **1st** | 5.2.6 commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717 |
| **2nd** | 5.2.7 Substitute for CFC |
| **3rd** | 5.3 Applications of refrigeration 5.3.1 cold storage |
| **4th** | 5.3.2 dairy refrigeration |
| **9th** | **1st** | 5.3.3 ice plant |
| **2nd** | 5.3.4 water cooler |
| **3rd** | 5.3.5 frost free refrigerator |
| **4th** | Revision of Chapter-5 |
| **10th** | **1st** | Previous year question solutions |
| **2nd** | PSYCHOMETRICS &COMFORT AIR CONDITIONING SYSTEMS 6.1 Psychometric terms |
| **3rd** | 6.2 Adiabatic saturation of air by evaporation of water |
| **4th** | 6.3 Psychometric chart and uses. |

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| **11th** | **1st** | 6.4 Psychometric processes |
| **2nd** | 6.4.1 Sensible heating and Cooling |
| **3rd** | 6.4.2 Cooling and Dehumidification |
| **4th** | 6.4.3 Heating and Humidification |
| **12th** | **1st** | 6.4.4 Adiabatic cooling with humidification |
| **2nd** | 6.4.5 Total heating of a cooling process |
| **3rd** | 6.4.6 SHF, BPF, |
| **4th** | 6.4.7 Adiabatic mixing |
| **13th** | **1st** | 6.4.8 Problems on above. |
| **2nd** | 6.5 Effective temperature and Comfort chart |
| **3rd** | Revision of Chapter-6 |
| **4th** | Previous year question solutions |
| **14th** | **1st** | AIR CONDITIONING SYSTEMS 7.1 Factors affecting comfort air conditioning. . |
| **2nd** | 7.2 Equipment used in an air-conditioning. |
| **3rd** | 7.3 Classification of air-conditioning system |
| **4th** | 7.4 Winter Air Conditioning System |
| **15th** | **1st** | 7.5 Summer air-conditioning system. |
| **2nd** | 7.6 Numerical on above |
| **3rd** | Revision of Chapter-7 |
| **4th** | Previous year question solutions |