

THS

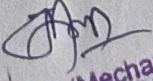
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|--------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Discipline :<br><b>MECHANICAL<br/>ENGG</b> | Semester<br>: 5th                                             | Name of the Teaching Faculty : <b>MUKESH KUMAR DALEI</b>                                                                                                     |
| Subject: <b>RAC</b>                        | No. of<br>days/per<br>week<br>class<br>allotted:<br><b>04</b> | No. of Weeks: <b>15</b>                                                                                                                                      |
| Week                                       | Class<br>Day                                                  | Theory / Practical Topics                                                                                                                                    |
| 1 <sup>ST</sup>                            | 1 <sup>ST</sup>                                               | <b>AIR REFRIGERATION CYCLE.</b><br>Definition of refrigeration and unit of refrigeration.                                                                    |
|                                            | 2 <sup>ND</sup>                                               | Definition of COP, Refrigerating effect (R.E )                                                                                                               |
|                                            | 3 <sup>RD</sup>                                               | Principle of working of open and closed air system of refrigeration                                                                                          |
|                                            | 4 <sup>TH</sup>                                               | Calculation of COP of Bell-Coleman cycle and numerical on it                                                                                                 |
| 2 <sup>ND</sup>                            | 1 <sup>ST</sup>                                               | Calculation of COP of Bell-Coleman cycle and numerical on it                                                                                                 |
|                                            | 2 <sup>ND</sup>                                               | <b>SIMPLE VAPOUR COMPRESSION REFRIGERATION SYSTEM</b><br>schematic diagram of simple vapors compression refrigeration system                                 |
|                                            | 3 <sup>RD</sup>                                               | Types<br>Cycle with dry saturated vapors after compression.                                                                                                  |
|                                            | 4 <sup>TH</sup>                                               | Cycle with wet vapors after compression.                                                                                                                     |
| 3 <sup>RD</sup>                            | 1 <sup>ST</sup>                                               | Cycle with superheated vapors after compression                                                                                                              |
|                                            | 2 <sup>ND</sup>                                               | Cycle with superheated vapors before compression.                                                                                                            |
|                                            | 3 <sup>RD</sup>                                               | Cycle with sub cooling of refrigerant                                                                                                                        |
|                                            | 4 <sup>TH</sup>                                               | Representation of above cycle on temperature entropy and pressure enthalpy diagram                                                                           |
| 4 <sup>TH</sup>                            | 1 <sup>ST</sup>                                               | Numerical on above (determination of COP, mass flow)                                                                                                         |
|                                            | 2 <sup>ND</sup>                                               | Numerical on above (determination of COP, mass flow)                                                                                                         |
|                                            | 3 <sup>RD</sup>                                               | Numerical on above (determination of COP, mass flow)                                                                                                         |
|                                            | 4 <sup>TH</sup>                                               | <b>VAPOUR ABSORPTION REFRIGERATION SYSTEM</b><br>Simple vapor absorption refrigeration system                                                                |
| 5 <sup>TH</sup>                            | 1 <sup>ST</sup>                                               | Practical vapor absorption refrigeration system                                                                                                              |
|                                            | 2 <sup>ND</sup>                                               | COP of an ideal vapor absorption refrigeration system                                                                                                        |
|                                            | 3 <sup>RD</sup>                                               | Numerical on COP.                                                                                                                                            |
|                                            | 4 <sup>TH</sup>                                               | Numerical on COP.                                                                                                                                            |
| 6 <sup>TH</sup>                            | 1 <sup>ST</sup>                                               | Numerical on COP.                                                                                                                                            |
|                                            | 2 <sup>ND</sup>                                               | Numerical on COP.                                                                                                                                            |
|                                            | 3 <sup>RD</sup>                                               | <b>REFRIGERATION EQUIPMENTS</b><br><b>REFRIGERANT COMPRESSORS</b><br>Principle of working and constructional details of reciprocating and rotary compressors |
|                                            | 4 <sup>TH</sup>                                               | Centrifugal compressor only theory<br>Important terms                                                                                                        |
| 7 <sup>TH</sup>                            | 1 <sup>ST</sup>                                               | Hermetically and semi hermetically sealed compressor.                                                                                                        |
|                                            | 2 <sup>ND</sup>                                               | <b>CONDENSERS</b><br>Principle of working and constructional details of air cooled and water cooled condenser                                                |
|                                            | 3 <sup>RD</sup>                                               | Heat rejection ratio.                                                                                                                                        |

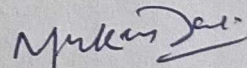
|                  |                 |                                                                                          |
|------------------|-----------------|------------------------------------------------------------------------------------------|
|                  | 4 <sup>TH</sup> | Cooling tower and spray pond.                                                            |
|                  |                 | <b>EVAPORATORS</b>                                                                       |
| 8 <sup>TH</sup>  | 1 <sup>ST</sup> | Principle of working and constructional details of an evaporator.                        |
|                  | 2 <sup>ND</sup> | Types of evaporator.                                                                     |
|                  | 3 <sup>RD</sup> | Bare tube coil evaporator, finned evaporator, shell and tube evaporator.                 |
|                  |                 | <b>REFRIGERANT FLOW CONTROLS,<br/>REFRIGERANTS &amp; APPLICATION OF<br/>REFRIGERANTS</b> |
|                  |                 | <b>EXPANSION VALVES</b>                                                                  |
|                  |                 | Capillary tube                                                                           |
|                  |                 | Automatic expansion valve                                                                |
|                  |                 | Thermostatic expansion valve                                                             |
|                  | 4 <sup>TH</sup> | <b>REFRIGERANTS</b>                                                                      |
|                  |                 | Classification of refrigerants                                                           |
| 9 <sup>TH</sup>  | 1 <sup>ST</sup> | Desirable properties of an ideal refrigerant.                                            |
|                  |                 | Designation of refrigerant.                                                              |
|                  | 2 <sup>ND</sup> | Thermodynamic Properties of Refrigerants.                                                |
|                  |                 | Chemical properties of refrigerants.                                                     |
|                  | 3 <sup>RD</sup> | commonly used refrigerants, R-11, R-12, R-22, R-134a, R-717                              |
|                  | 4 <sup>TH</sup> | Substitute for CFC                                                                       |
| 10 <sup>TH</sup> | 1 <sup>ST</sup> | Applications of refrigeration                                                            |
|                  |                 | cold storage                                                                             |
|                  | 2 <sup>ND</sup> | dairy refrigeration                                                                      |
|                  | 3 <sup>RD</sup> | ice plant                                                                                |
|                  |                 | water cooler                                                                             |
|                  | 4 <sup>TH</sup> | frost free refrigerator                                                                  |
| 11 <sup>TH</sup> | 1 <sup>ST</sup> | <b>PSYCHOMETRICS &amp; COMFORT AIR CONDITIONING<br/>SYSTEMS</b>                          |
|                  |                 | Psychometric terms                                                                       |
|                  | 2 <sup>ND</sup> | Adiabatic saturation of air by evaporation of water                                      |
|                  |                 | Psychometric chart and uses.                                                             |
|                  | 3 <sup>RD</sup> | Psychometric processes                                                                   |
|                  |                 | Sensible heating and Cooling                                                             |
|                  | 4 <sup>TH</sup> | Cooling and Dehumidification                                                             |
|                  |                 | Heating and Humidification                                                               |
| 12 <sup>TH</sup> | 1 <sup>ST</sup> | Adiabatic cooling with humidification                                                    |
|                  |                 | Total heating of a cooling process                                                       |
|                  | 2 <sup>ND</sup> | SHF, BPF,                                                                                |

|                  |                 |                                               |
|------------------|-----------------|-----------------------------------------------|
|                  |                 | Adiabatic mixing                              |
|                  | 3 <sup>RD</sup> | Problems on above.                            |
|                  | 4 <sup>TH</sup> | Problems on above.                            |
| 13 <sup>TH</sup> | 1 <sup>ST</sup> | Problems on above.                            |
|                  | 2 <sup>ND</sup> |                                               |
|                  |                 | Effective temperature and Comfort chart       |
|                  | 3 <sup>RD</sup> | <b>AIR CONDITIONING SYSTEMS</b>               |
|                  |                 | Factors affecting comfort air conditioning. . |
|                  | 4 <sup>TH</sup> | Equipment used in an air-conditioning         |
| 14 <sup>TH</sup> | 1 <sup>ST</sup> | Classification of air-conditioning system     |
|                  | 2 <sup>ND</sup> |                                               |
|                  |                 | Winter Air Conditioning System                |
|                  | 3 <sup>RD</sup> | Summer air-conditioning system.               |
|                  | 4 <sup>TH</sup> | Numerical on above                            |
| 15 <sup>TH</sup> | 1 <sup>ST</sup> | Numerical on above                            |
|                  | 2 <sup>ND</sup> | Numerical on above                            |
|                  | 3 <sup>RD</sup> | Numerical on above                            |
|                  | 4 <sup>TH</sup> | Numerical on above                            |

#### Learning Resources:

01. REFRIGERATION AND AIRCONDITIONING BY C.P ARRORA, TMH
02. REFRIGERATION AND AIRCONDITIONING BY R.S.KHURMI & J.K.GOPTA, S.CHAND
03. REFRIGERATION AND AIRCONDITIONING BY P.L BALLANY, KHANNA PUBLISHER
04. REFRIGERATION AND AIRCONDITIONING BY DOMKUNDRA ANDARORA, DHANPAT RAY AND SONS

  
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