

Advanced Refrigeration & Air-Conditioning

B.E. Sem. VIII [MECH/AUTO]

(Elective – II)

EVALUATION SYSTEM

	Time	Marks
Theory Exam	3 Hrs.	100
Practical Exam	–	–
Oral Exam	–	25
Term Work	–	25

SYLLABUS

- 1. Refrigeration cycles :** Concept of SST & SDP pressure drops.
Equipments: Compressor-Reciprocating , Centrifugal , rotary screw, Details of rating selection procedure ARI standards, capacity control methods, Condensers & evaporators-Detailed study of various types (for Halocarbon & ammonia applications), Vertical Chiller, tank & coil systems, technical selection, manufacturing details, ASME code & TEMA standards , Evaporator-compressor balance.
- 2. Refrigerant Controls:** Electrical, electronic flow control, level control, capillary, TXV's selection and installation , safety and operating controls.
Refrigerant : Properties, application, azeotropes, zeotropes, R134a, 142b, ammonia, ozone depletion Montreol protocol, TEWI factors-brines-limitations of usage
Cooling Towers: Performance & Selection
- 3.** Multistaging-booster, intertalling compounded cascading
Heat Pumps-Energy conservation, fouling factor double & single bundle condensers.
Refrigerant piping-Materials, accessories, suction discharge & liquid line sizing, single & double rises, layout, installation practice & layouts
- 4. Water Piping:**
Condenser, Cooling Tower & Chilled water piping, accessories-installation
Electrical Motors:
Types, selection IS code wiring layout, starter fuses etc.
Vapor absorption system:
Li Br water single & double stage, direct fired, manufacturers, Operation & Practical difficulties.
- 5.** Steam ejector System(in brief)
Air conditioning-Psychrometry:
Cooling load estimation for all kinds of application including low RH class room, hospitals, synthetic fibre plants etc.
- 6. Design of Air-ducts :**
Use of ductulator air handling units, selection of fins & blowers, air washers, ISI & SMACNA standards, package units.
Erection of Systems:
Foundation, details placing the system in operation, adjustment & final check, routine & seasonal maintenance, shut down & starting Trouble analysis, common service operation.

Reference Books :

1. Refrigeration-Principles & Systems (*Edward G. Pita*) John Wiley & Sons.
2. Refrigeration & Air Conditioning (*W.L.Stocche & J.W.Jons*) McGraw Hill Pvt. Ltd.
3. Air Conditioning Principles & Systemsd (*Edward G. Pita*) John Wiley & sons
4. Refrigeration & Air Conditioning (*C.P.Arora*) Tata McGraw Hill.
5. Heating , Ventilating and Air Conditionng (*Faye C. Mcquistton*) Wiley India
6. Principles of Referigeration (*Roy Dossat*) Wiley Estern ltd.

