## Module 1



**Syllabus : Basic Knowledge :** Carnot refrigerator, Carnot heat pump, Coefficient of performance, Reversed carnot cycle and its limitation. Effect of temperature and pressure on COP of the cycle.

**Refrigerants :** Classification, Designation, Selection of refrigerant, Physical and chemical properties of refrigerants, Secondary refrigerants.

**Syllabus : Thermal Comfort Conditions :** Selection of inside design conditions, thermal comfort, heat balance equation for a human being, factors affecting thermal comfort, Effective temperature, comfort chart and factors governing effective temperature, selection of outside design conditions.

**Cooling Load Estimation : RSHF, ERSHF and GSHF**

Introduction, Components of cooling load Different heat sources Various load Estimation. Design of air conditioning system. Building survey and economic aspect used in design.



**Module 4**



**Syllabus : Duct :** Classification of ducts, duct material, pressure in ducts, flow through duct, pressure losses in duct Air flow through simple duct system, Equivalent diameter, Methods of duct system design

**Air Handling Unit :** Introduction to Fan coil unit, Types of fans used air conditioning applications, Fan laws, Filters supply and return grills, Sensors.

**Module 5**



**Syllabus : HVACR and Components :** Working of reciprocating, screw and scroll compressors, working of air cooled and water cooled and evaporative condensers, Working of DX, Flooded and Forced feed evaporators, Expansion devices Capillary tube, TXV, EXV, Type of insulation materials.

**Module 6**

**Chapter 11 : Applications of HVAC and R Systems 11-1 to 11-21**

**Syllabus :** Ice plant, Food storage plants, dairy and food processing plants, freeze drying, A/c in textile, Printing pharmaceutical industry and Hospitals, cold chain Technology, Transport air conditioning, Solar refrigeration.



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