

REFRIGERATION & AIR – CONDITIONING

THEORY – II

VAPOUR REFRIGERATION :

Vapour compression refrigeration system, T- Φ and P-H diagrams – Effect of under cooling and super heating – effect of suction and delivery pressure – effect of suction temperature on cycle efficiency – effect of condensing temperature on cycle efficiency – Vapour absorption refrigeration system – difference between vapour compression and absorption system – problems.

COMPRESSORS :

Types of compressor – reciprocating compressors – screw compressors – centrifugal compressor and Hermetically sealed compressors – cylinder, piston, suction and discharge valves – Compression ratio – volumetric efficiency – capacity – effect of sub-cooling and super heating on compressor performance – lubricating oils – properties – methods of lubrication – oil separator – overhauling of compressors.

EVAPORATORS, CONDENSORS, COOLING TOWERS :

Evaporators : Types of construction – surface area of evaporator – air cooling finned evaporator – liquid chilling evaporators – shell and tube cooler, dry expansion chiller, flooded chiller – plate type heat exchanger and secondary refrigeration.

CONDENSORS :

Types – air cooled – water cooled and evaporative condenser – water cooled condenser circuit – fouling rates – double tube type – shell and coil type – shell and tube type – plate type heat exchangers – condenser controls.

COOLING TOWERS :

Natural draft atmospheric spray – forced and induced draft cooling towers – selecting the proper cooling tower – installing the water pumps.

REFRIGERANT FLOW CONTROL :

Hand expansion valves – Thermostatic expansion valves – constant pressure expansion valves – capillary tubes – selection/sizing of flow control device.

AIR-CONDITIONING :

Introduction to air conditioning – requirements of human comfort – heat and moisture losses from human body – ventilation – classification about summer and winter air conditioning – recommended inside design conditions. Air cleaning and air filter – odour removal – forced evaporation humidifier – fan and blowers – Axial flow fans – centrifugal fans – duct, air control dampers diffusers and frills – and type of Insulations.

Necessity of defrosting – manual defrosting – automatic periodic defrosting – automatic hot gas defrosting.

APPLICATION OF AIR CONDITIONING AND REFRIGERATION :

Industrial application – Dairy, Brewery, Food preservation and cold storage – domestic refrigerator – commercial application of air conditioning – Window, split and central air conditioning – transport air Conditioning – installation procedures – operation and maintenance.

ELECTRIC MOTORS AND CONTROL CIRCUITS :

Type of motors used in refrigeration and air conditioning – Single phase and three phase Induction motors – hermetic motors – selection of starters & relays – thermal over load protection relay for hermetic motors – thermostat – interlocking controls – control circuit and wiring diagram – Electric motors and controls common troubles and rectification.

REFERENCE :

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