

Total No. of Questions :6]

SEAT No. :

P15

TE/Insem./APR-18

[Total No. of Pages : 2

T.E. (Mechanical)

302049 : REFRIGERATION AND AIR CONDITIONING

(2015 Pattern) (Semester II)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.
- 4) Use of calculator is allowed.
- 5) Assume suitable data if necessary.

Q1) a) Compare evaporative cooler with air conditioning. [6]

b) Describe selection of environment friendly refrigerant. [4]

OR

Q2) a) Discuss the necessity of phasing out of CFC refrigerants. [4]

b) Explain the working of ice plant with neat sketch. [6]

Q3) a) A VCR plant operates between evaporator and condenser temperature at -15°C and 40 °C respectively. The refrigerant is dry and saturated at the section. Discharge temperature of refrigerant is 98°C. The bore and stroke of compressor are 85 mm each. It runs at 750 rpm with volumetric efficiency of 82%. The liquid enters expansion valve at 32°C. Calculate COP, mass flow rate of refrigerant. ($C_{p_{liq}}=1.62\text{KJ/KgK}$, $C_{p_{gas}}=0.96\text{KJ/Kgk}$) [6]

Saturation temperature °C	V_g (m ³ /kg)	h_f kJ/kg	h_g kK/kg	S_f kJ/kgK	S_g kJ/kgK
-15	0.24	43.4	458.7	0.18	1.742
40	0.043	131	468.6	0.48	1.567

P.T.O.

- b) Compare vapour compression refrigeration system with vapour absorption system. [4]

OR

- Q4)** a) Explain aqua ammonia vapour absorption system with schematic diagram. [4]
b) Draw and explain actual vapour compression cycle in detail. [6]

- Q5)** a) Explain the limitations of the single stage vapour compression refrigeration system for production of low temperature. [4]
b) Explain multi evaporator refrigeration system with all the evaporators at same temperature and derive equation for COP of the system. [6]

OR

- Q6)** a) What is cryogenics? Give any four applications of cryogenics. [4]
b) Explain working of Cascade refrigeration system with P-h diagram. [6]