

Total No. of Questions : 6]

SEAT No. :

P509

[Total No. of Pages : 3

APR - 18/TE/Insem. - 108

T.E. (Mechanical)

REFRIGERATION & AIR CONDITION

(2015 Pattern) (Semester - II)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary.

- Q1)** a) Explain with neat sketch the working of domestic air conditioner. [4]
b) Derive the ASHRAE designation for the refrigerants R22, R134a and Ammonia. [6]

OR

- Q2)** a) Explain with neat sketch the working of an ice plant. [6]
b) Explain the recovery, recycling and reclaiming of refrigerant. [4]

- Q3)** a) Explain with diagram three fluid vapour absorption refrigeration system. [4]
b) Simple saturated vapour compression cycle using ammonia has capacity of 25 TR. Evaporator and condenser temperatures are - 5°C and 40°C respectively. Calculate [6]

- i) mass flow rate of refrigerant.
- ii) COP.

Take $C_{pv} = 2.1897 \text{ kJ/kgK}$.

Sat. Temp	h_f	h_g	s_f	s_g
°C	kJ/kg	kJ/kg	kJ/kg.K	kJ/kg.K
-5	176.9	1456.1	0.9154	5.6856
40	390.6	1490.4	1.6437	5.1558

OR

P.T.O.

Q4) a) Explain effect of superheating and sub cooling on the performance of VCC. [4]

b) A vapour absorption cycle has generator temperature 120°C , evaporator temperature is -10°C and ambient temperature is 30°C . Calculate COP. If the plant capacity is 100 TR, Calculate the fuel consumption of the plant. Take calorific value of fuel as 40 MJ/kg. [6]

Q5) A multi evaporator refrigeration system with individual compressors and an individual expansion valves using R-22 as the refrigerant as shown in Fig. 1 Neglecting undercooling of liquid and superheating of vapour refrigerant. Find [10]

i) Power required to run the system.

ii) COP.

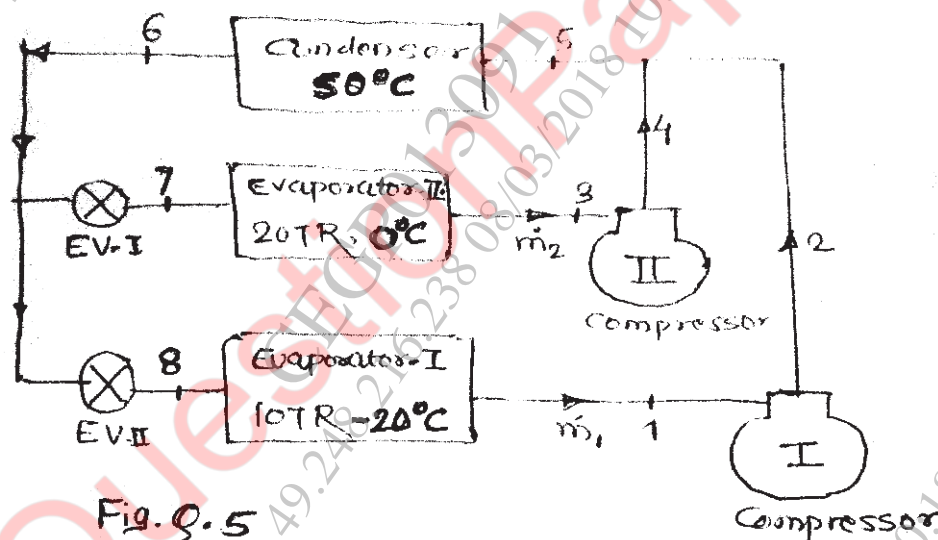
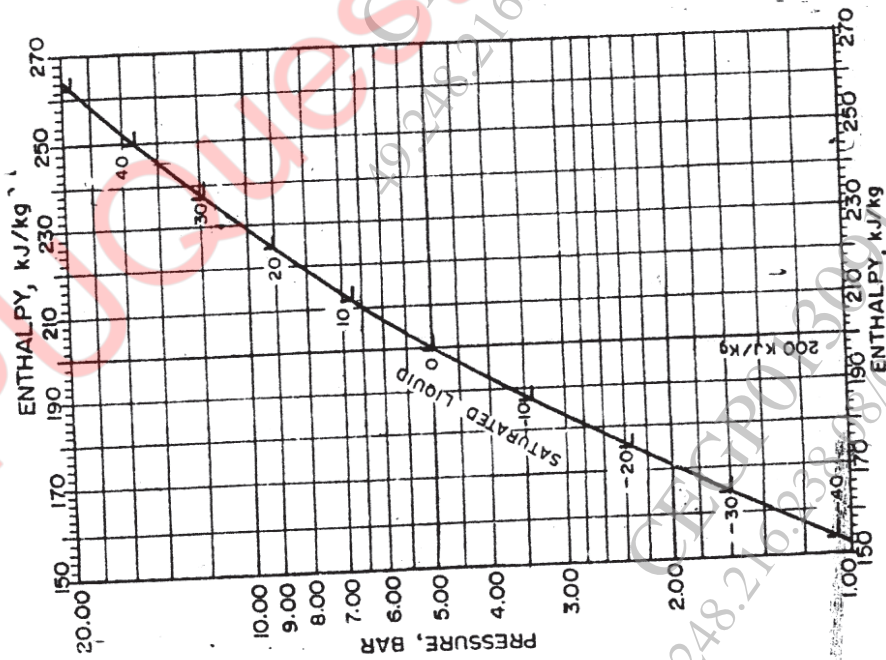
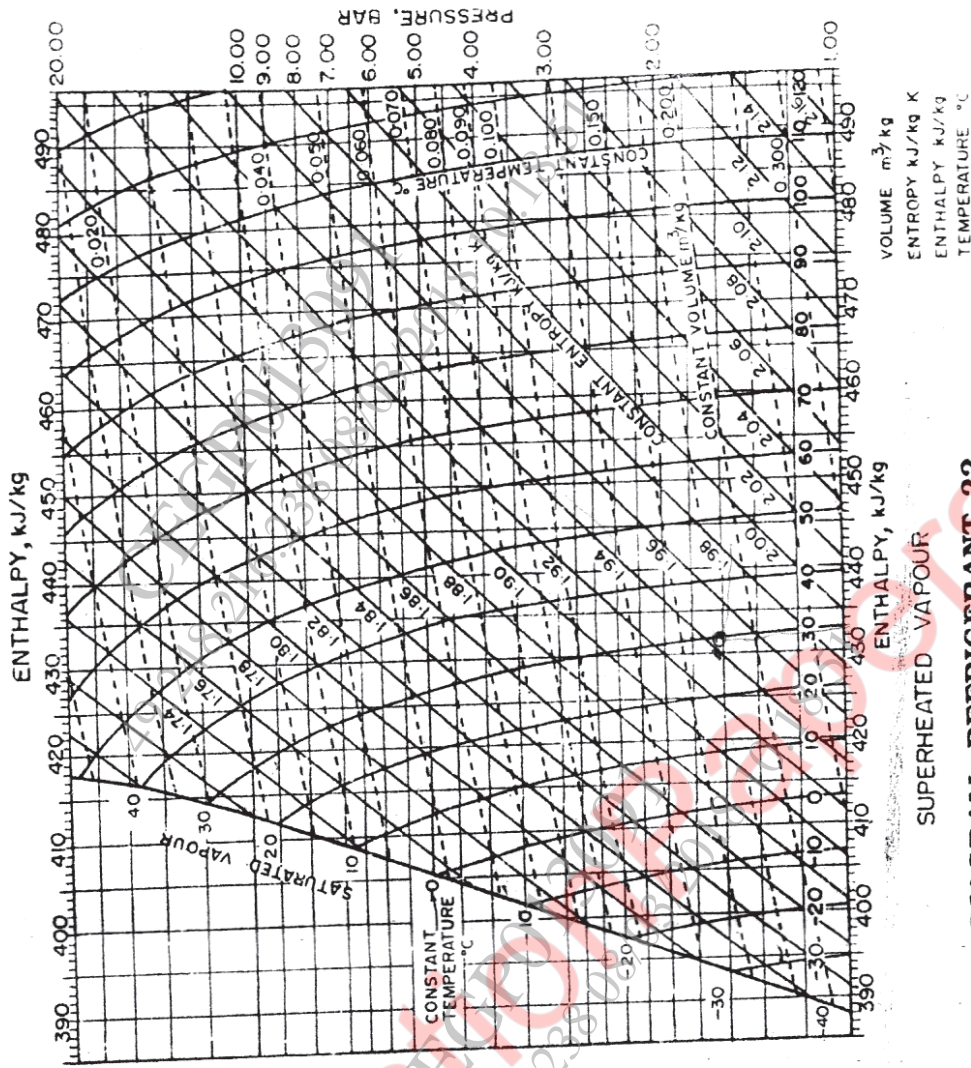


Fig.1 for Q.5

OR

Q6) a) Explain Cascade refrigeration system with schematic and p-h diagram. [6]

b) Explain with p-h diagram a Linde-Hampson cycle. [4]



REFRIGERANT 22
ENTHALPY - PRESSURE



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