प्रो. m.v. jewale

MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Tech. (Agril. Engg.)

Semester	: VI (New)	Term : II	Academic Year : 2015-16
Course No.	: APE 368	Title : **Refrigeration and Air Conditioning**	
Credits	: 2 (1+1)		
Day & Date	: Tuesday, 26.04.2016	Time : 09.00 to 11.00	Total Marks : 40

Note : 1. Solve **ANY EIGHT** questions from **SECTION "A"**.
2. All questions from **SECTION "B"** are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1   1.5 kW per tonne of refrigeration is required to maintain the temperature of -40^0C in the refrigeration. If refrigeration cycle works on Carnot cycle, determine:

a) Coefficient of performance of the cycle

b) Temperature of the sink

c) Heat rejected to the sink per tonne of refrigeration.

d) Energy performance ratio, if the cycle is used as heat pump.

Q.2   Explain in detail heat engine, refrigerator and heat pump.

Q.3   Differentiate between

1) Humidification and dehumidification

2) Sensible cooling and sensible heating

Q.4   Explain in detail the mechanism of simple vapour compression refrigeration system.

Q.5   What do you mean by evaporative refrigeration system? Explain the method of making artificial snow.

Q.6   a) What are the different equipments /parts used in an air conditioning systems. Write their functions.

b) What do you mean by the term heat stroke?

Q.7   a) State the advantages of vapour absorption refrigeration system over compression refrigeration system.

b) Explain in brief the term air stratification.

Q.8   On a particular day, atmospheric air was found to have a dry bulb temperature of 30^0 C and bulb temperature of 18^0 C. The barometric pressure was observed to be 756 mm of Hg. Using steam tables, determine

1) Relative humidity   2) Specific humidity   3) Dew point temperature

Q.9   a) Explain the secondary refrigerant–brine.

b) Discuss in brief the physical properties of refrigerant.

(P.T.O.)

Q.10 In an ammonia vapour compression system, the pressure in evaporator is 2 bar. Ammonia at exit is 0.85 dry and at entry its dryness fraction is 0.19. During compression, the work done per kg of ammonia is 150 kJ. Calculate the C.O.P. and the volume of vapour entering the compressor per minute, if the rate of ammonia circulation is 4.5 kg/min. The latent heat and specific volume at 2 bar are

1325 kJ/kg and 0.54 m^3/kg respectively.

SECTION "B"

Q.11 Do as directed.

1) Define – Degree of saturation.

2) What is aqua ammonia?

3) Give full form of ASHRAE.

4) State the Dalton's law of partial pressure.

Q.12 State True or False.

1) The boiling point of ideal refrigerant should be high at atmospheric pressure.

2) At atmospheric pressure, sublimation temperature of dry ice is 10^0 C.

3) Evaporator is placed in high pressure side of vapour compression refrigeration system.

4) Sensible heat factor is same as sensible heat ratio.

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