6639

BOARD DIPLOMA EXAMINATIONS

OCT/NOV-2019

DME – FIFTH SEMESTER

REFRIGERATION & AIR CONDITIONING

Time:3 hours   Max. Marks: 80

PART – A   **3 X 10 = 30**

Instructions: 1. *Answer **all** questions.*
2. *Each question carries **Three** Marks.*
3. *Answer should be brief and straight to the point and should not exceed Five simple sentences.*

1.   Write any six methods of refrigeration.

2.   List out basic components of vapour compression refrigeration system and their functions.

3.   Represent vapour compression cycle on T-S and P-H diagrams when the vapour is wet at the end of compression.

4.   Write any three desirable properties of refrigerant absorbent pair.

5.   What are the functions of compressor in a refrigeration system?

6.   Compare water cooled Condenser with air cooled condenser.

7.   What is an Azeotrope. List out any two Azeotropes.

8.   Define the term air conditioning and write human comfort conditions.

9.   State the purpose of grills. List out different types of grills.

10.   State the advantage of central air conditioning system.

Instructions: 1. *Answer any **Five** questions*
2. *Each question carries **TEN** Marks.*
3. *Answer should be comprehensive and Criteria for*
    Valuation is the content but not the length of the answer.

11. In a Bell- Coleman refrigeration pant, air is drawn into the cylinder of the
compressor at a pressure of 1 bar and temperature -5^0C and is comprssed
isentropically to 5 bar at which it is cooled to 15^0C, it is then expanded in an
expansion cylinder to 1 bar and discharged into a refrigerating plant
chamber. If the law of expansion is $PV^{1.2}$=C, find the net work done on the
air per kg of air and the coefficient of performance of the refrigeration plant.
Take specific heat of air at constant pressure as 1.0035kJ/kg K. take γ =1.4
and R=0.287kJ/kg k for air.

12. An ideal vapour compression refrigerator using Freon-12 operators between
temperature limits of -10^0Cand 35^0C. the refrigerant leaves the compressor
dry and saturated. There is no under cooling of the liquid refrigerant . The
rate of flow of refrigerant through the unit is 100kg/hr. calculate the
refrigerating effect per kg of refrigerant, the COP and the capacity of the
plant. Use the data given in the below table.

Saturated Temperature (^{0}C)	Enthalpy kJ/kg		Entropy kJ/kg K	
	Liquid	Vapour	Liquid	Vapour
35	69.61	204.95	------	0.6945
-10	26.16	185.52	0.1051	0.7108

13. Draw a neat diagram of Lithium Bromide water absorption refrigeration system and explain its working .

14. a)what are the functions of thermostatic expansion valve?

b) Draw a neat sketch of solenoid valve and explain its working.

15. a) Define refrigerant. List out the common primary refrigerants.

b) Draw a neat sketch of water cooler and explain its working.

16. Describe any two types of duct systems employed to supply conditioned air to outlets.

17. 900 kg/hr. of return air at DBT 24^{0}C and RH 60% mixes with 100 kg/hr.of fresh air of DBT 40^{0}C and RH 30%. Calculate the final condition of this mixture.

18. Explain with a neat sketch, the working principle of summer air conditioning when Climate is Hot and Dry outdoor conditions.