Registration No:

Total Number of Pages : 02 M.TECH
AR-18
M.TECH 1ST SEMESTER EXAMINATIONS(BACK), NOV/DEC 2019
ADVANCED REFRIGERATION ENGINEERING
Branch: TE, MTEPC1020

Time: 3 Hours   Max Marks : 70
The figures in the right hand margin indicate marks.
PART-A   (10 X 2=20 MARKS)
1. Answer the following questions.
a) Name a refrigerant which works as Primary, Secondary as well as tertiary refrigerant.

b) What is the use of air washer?

c) Explain why sudden expansion causes cooling.

d) Differentiate between Relative humidity and Specific humidity.

e) Write atleast one advantage and disadvantage of capillary tube over expansion valve.

f) Discuss the advantages of compound compression with intercooler over single stage

compression.

g) Define the term by-pass factor.

h) What is a power fluid in a thermostatic expansion valve?

i) What is dry ice?

j) What is the difference between WBT and DBT called?
PART-B   (5 X 10=50 MARKS)
Answer any five questions from the following.

Q.2.
a) Write the working principle of a thermostatic expansion valve.
b) Discuss the balancing point of compressor and capillary tube.

Q.3.
a) Explain with neat schematic diagram the working principle of dry ice manufacturing.
b) Explain the liqueification of air.

Q.4.
a) The amount of air supplied to an air conditioned hall is 300m³/min. The atmospheric
conditions are 35°C DBT and 55% RH. The required conditions are 20°C DBT and 60% RH.
Find out the sensible heat and latent heat removed from the air per minute. Also find sensible heat
factor for the system.
b) A mixture of dry air and water vapor is at a temperature of 21°C under a total pressure of 736

mm Hg. The dew point temperature is 15°C. Find:

(i) Partial pressure of water vapor

(ii) Relative humidity

(iii) Degree of saturation

(iv) Specific humidity

Q.5.
a) Derive an expression for the COP of a Thermo-electric refrigeration system.
b) Why Multi-staging is required for low temperature refrigeration system?

Q.6.
a) Derive an expression for optimal inter stage pressure of a two stage compression refrigeration system.
b) Discuss the method of producing liquid nitrogen?

Q.7.
a) Discuss different methods of intercooling.
b) Derive an expression for the COP of a Thermoelectric refrigeration system

Q.8. Write short notes on

a) Fouling factor
b) Cooling Tower

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