(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 2289908 Roll No.

B.TECH.

Regular Theory Examination (Odd Sem-V), 2016-17

REFRIGERATION AND AIR CONDITIONING

Time : 3 Hours *Max. Marks : 100*

SECTION - A

1. Attempt all parts. Write answer of each part in short. (10×2=20)

a) What are the components of VCRs.

b) What are the types of refrigerant

c) What are the modes of heat transfer.

d) What is sensible heating.

e) Explain I ton of refrigeration.

f) Explain latent heat.

g) Define the terms enthalpy and entropy.

h) Define compressor.

i) Define Dew point Temperature.

j) What is air conditioning.

SECTION - B

2. Attempt any five questions from this section. (5×10=50)

a) Enlist various types of air refrigeration system being employed for air craft refrigeration and briefly describe an one of them with the help of a neat labeled sketch.

b) What are the different refrigeration system used for common cooling purpose. Describe briefly any one of them.

c) Ice is formed at 0^0C from water at 200C. The temperature of the brine is -8^0C. Find out the kg of ice formed per KWh.

Assume that the refrigeration cycle used in perfect reversed carnot cycle. Take latent heat of ice 335 KJ/Kg.

d) In an absorption types of NH3 water refrigeration, the heat is supplied by steam at 3 bar, 0.9 dry. The evaporator temperature is maintained at -80C. The condenser rejects heat to cooling water available at 300C. The find the maximum C.O.P. of the system. In case of actual C.O.P. is 72% of maximum C.O.P. Find the mass refrigeration load of 30 TR.

e) State the function of the following components.

i) Absorber ii) Rectifier

iii) Analyzer iv) Generators.

f) Explain following process briefly with p-v diagram.

i) Isochoric process

ii) Isobaric process

iii) Isothermal process

iv) Adiabatic process

g) What are the advantages of food preservation? Explain in brief how refrigeration and freezes are used for food preservation.

h) Explain the working of VCRS and calculate the required expression for COP.

SECTION - C

Note : Attempt any two questions: (2×15=30)

3 Describe the operation of a boot strap air cycle system for aircraft application with help of this block diagram and temperature entropy diagram.

4. Explain the working and construction of vapour absorption cycle and what is a purpose of using analyser in vapour absorption cycle.

5. a) The pressure and temperature of air in a room is 1.01132 bar at 30^0C respectively. If the relative humidity is found to be 40% estimate the partial

pressure of water vapour, specific volume of each component, specific humidity and the dew point temperature.

b) What do you mean by Duct? Explain various types of duct system?

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