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5th Sem. / Mech. Engg.

ubject : REFRIGERATION AND AIR CONDITIONING

ime : 3 Hrs.

M.M. : 100

SECTION-A

Note: Very Short Answer type questions. Attempt any 15 parts. (15x2=30)

Q.1 a) Give two examples of primary and two example of secondary refrigerants.

b) Name the refrigerants which cool substances by absorbing their sensible heat. (primary or secondary).

c) Write the boiling point of R-O and R-22 refrigerants.

d) Name the principle on which domestic electro lux refrigerator works.

e) Name (three) accessories which are fitted in a simple absorption system to improve its efficiency.

f) Name the refrigerant / refrigerants commonly used in vapour absorption refrigerator.

g) How is enthalpy represented symbolically.

refrigeration system over vapour compression system.

j) Name two types of rotary compressor.

k) Define cooling tower?

l) What is use of expansion valve in refrigeration system?

m) Define saturated air

n) What is dry bulb temperature?

o) What is comfort air conditioning?

p) Define metabolic rate for a human body.

q) What is use of comfort chart?

r) Give one disadvantage of central air-conditioning.

SECTION-B

Note: Short answer type questions. Attempt any ten parts 10x4=40

Q.2 i) What are the main applications of refrigeration and air-conditioning?

ii) What are the main advantages of air refrigeration system?

iii) Explain thermo-electric refrigeration

ii) Differentiate between refrigeration and air conditioning.

iii) Name a few refrigeration methods.

iv) A machine works on reversed Carnot cycle between the temperature -8° c and T_2. If the COP of this machine is 8°03. find T_2.

v) In vapour compression system state the state of refrigerant in (a) Discharge line (b) Liquid line

vi) In vapour compression system state (a) In liquid line the refrigerant is received in it from _____ and it conveys to _____.

vii) Draw (labelled diagram) temperature entropy diagram of a vapour compression system when the vapour is wet at the end of the compression.

viii) Explain the effect of decrease in suction pressure with the help of pressure - enthalpy diagram.

ix) Name the various types of compressors used in vapour compression refrigeration system.

x) (a) Name the expansion device (b) Type of evaporator (c) Type of condenser usually used in domestic refrigerator.

xi) Give the chemical name of the following refrigerants:-

a) R-717 b) R-22 c) R-744

xii) Explain why is ammonia gas being used commercially when it is highly toxic and poisonous.

xiii) State the merits of air refrigerating system.

xiv) State during sensible heating of moist air (a) The enthalpy and (b) Relative humidity increases or decreases or remains constant.

xv) Define (a) Dew point temperature (b) Saturated air.

SECTION-C

Note: Long answer type questions. Attempt any three questions. 3x10=30

Q.3 Explain (a) Sensible heat (b) Latent heat (c) Total enthalpy of air and their units.

Q.4 Explain with a neat diagram the working of central system of air conditioning . Give its advantages and disadvantages.

Q.5 Discuss the properties of ideal refrigerants.

Q.6 What is simple vapour absorption system? Explain it principle and working with neat sketch.

Q.7 Give the reasons why actual vapour compression cycle differs from the theoretical cycle.