

Roll No.

5th Sem. / Mech. Engg.
Subject : Refrigeration and Air Conditioning

Time : 3 Hrs.

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M.M. : 100

SECTION-A

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

- Q.1
- How much is the heat removable capacity of 1 tone (ITR) refrigerator in one minute.
 - Which has higher C.O.P.
 - Domestic refrigerator
 - Domestic air conditioner.
 - Which has less C.O.P. vapour compression system or air refrigeration.
 - On which cycle air refrigerator works.
 - State whether the refrigerant is wet, super heated as it leaves the compressor.
 - State the boiling temperature of ammonia refrigerant.
 - State on which side a condenser is used i.e. higher or low pressure side of a refrigerating system.
 - Define dry bulb temperature and wet bulb temperature.

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- What happens to the dry bulb temperature during sensible heating of air. (increases or decreases)
- In which refrigeration system three fluids absorption system is used.
- The tubes of shell and tube condenser are made of _____ for ammonia refrigeration system.

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- State the function of accumulator in vapour compression system.
- Define latent heat.
- State the function of expansion valve in refrigeration system.
- How are refrigerants broadly classified.
- In which component of the refrigeration system heat is rejected by the refrigerant.
- In shell and coil condenser _____ flows in the coil and _____ in the shell.
- In refrigeration system which device is connected between receiver and evaporator.

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SECTION-B

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

- Q.2 i) A refrigerating machine working on Carnot cycle operate between 77°C and 13°C. Find its C.O.P. and write its units if any.

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- ii) Define air conditioning. How does it differs from refrigeration.
- iii) Differentiate between C.O.P. and efficiency.
- iv) Discuss advantages of air refrigeration over vapour compression system. •
- v) Write boiling point of ammonia and R_{12} . •
- vi) Discuss the properties of R-717.
- vii) Discuss the function of evaporator in a refrigerating system. HSBTEonline.com
- viii) What do you know of hermetically sealed compressors.
- ix) Differentiate between heating and humidification and cooling and dehumidification processes.
- x) Name the accessories filled in a simple absorption system to improve its efficiency.
- xi) State the overall effect of super heating vapours in a vapour compression system. •
- xii) Differentiate between open and closed air refrigeration systems. •
- xiii) Write the units of the following terms:-
 - i) Specific humidity and ii) Relative humidity
 - iii) Mass flow rate. ✓
- xiv) State the principle on which a capillary tube works. HSBTEonline.com
- xv) Enlist any four refrigeration methods.

SECTION-C

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

- Q.3 Enlist the various factor which effect the performance of vapour compression system and explain the effect of suction pressure with the help of p-H diagram. (decrease in suction).
- Q.4 Compare vapour compression and vapour absorption refrigeration systems. •
- Q.5 Differentiate between primary and secondary refrigerants. Give examples of each one. Also write the chemical name of the following R-11, R-12 and R-717. HSBTEonline.com
- Q.6 Explain a capillary tube giving its principle, internal diameter, normal length, use etc. Also state why it is preferred to other throttling devices in house hold refrigerators.
- Q.7 Write short notes on :-
 - a) Evaporative condenser (working and diagram)
 - b) Draw a psychrometric chart showing different lines.

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