

Code No: C9101

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M.Tech I Semester Examinations, March/April 2011

REFRIGERATION

(HEATING VENTILATION & AIR CONDITING)

Time: 3hours

Max. Marks: 60

Answer any five questions

All questions carry equal marks

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- 1.a) Sketch and explain the working of vapour-compression system with $p-h$ and $T-\theta$ diagrams.
- b) What is effect of condensing temperature and Evaporating temperature of COP and refrigerating effect? Explain. [12]
- 2.a) Describe with a neat sketch of two-stage cascade system with $p-h$ diagram.
- b) What are the advantages of multi-stage refrigeration system and what is its effect of evaporating temperature? [12]
- 3.a) Describe with a neat sketch the working of Lithium-bromide vapour absorption systems.
- b) In an absorption type refrigeration the heat is supplied to NH_3 generator by condensing steam at 2 bar and 90% dry. The temperature to be maintained in the refrigerator is -5°C . The temperature of the atmosphere is 30°C . Find the maximum COP possible of the refrigerator. If the refrigeration load is 20 tons and actual COP is 70% of maximum COP, find the mass of steam required per hour. [12]
4. Explain the following with a sketch:
- Air refrigeration system
 - Steam-Jet refrigeration system
 - Thermo-electric refrigeration system
 - Vertex tube. [12]
- 5.a) Briefly discuss the industrial refrigeration.
- b) What type of refrigeration is adopted in chemical industry? Explain in detail. [12]
6. Discuss in detail the following:
- Daily plants
 - Petroleum refineries. [12]
- 7.a) Differentiate between primary and secondary refrigerants.
- b) What are the thermodynamics properties of a refrigerant? Explain. [12]
8. Write short notes on:
- Methods of improving COP of vapour compression system.
 - Dry ice system
 - Electrolux-Refrigerator. [12]
