

G 631

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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2014

Seventh Semester

Branch : Mechanical Engineering / Automobile Engineering

REFRIGERATION AND AIRCONDITIONING (M, U)

(Old Scheme – Prior to 2010 Admissions)

[Supplementary]



Time : Three Hours

Maximum : 100 Marks

*Use of Refrigeration and Airconditioning tables and charts and
Steam tables are permitted.*

Part A

Answer all questions.

Each question carries 4 marks.

1. Define the COP of a refrigerator.
2. What are the advantages of air refrigeration systems?
3. What is the function of a flash intercooler provided in a multistage vapour compression refrigeration system?
4. Explain Actual vapour compressors system with the help of neat p-h diagram.
5. What is the role of Analyser and Rectifier in an absorption system refrigeration?
6. Derive the expression for COP of an ideal vapour absorption system.
7. Explain the working of a thermostatic expansion valve with a sketch.
8. Explain Direct expansion coils.
9. Write short note on the factors affecting comfort Airconditioning.
10. Write short note on the design of air duct systems.

(10 × 4 = 40 marks)

Part B

Answer all questions.

Each question carries 12 marks.

11. A Bell-Coleman refrigerator operates between pressure limits of 1 bar and 8 bar. Air is drawn from the cold chamber at 9° C, compressed and then it is cooled to 29° C before entering the

Turn over

expansion cylinder. Expansion and compression follow the law $pv^{1.35} = \text{constant}$. Calculate the theoretical Cop of the system. For air take $\gamma = 1.4$, $C_p = 1.003 \text{ kJ/kgK}$.

Or

12. Explain with the help of T.S. diagram and schematic diagram, the working of Boot strap system with evaporative cooling.
13. Describe the factors affecting the performance of a simple vapour compression system.

Or

14. A Freon-12 refrigerator is required to produce ice at 0°C from water at 20°C . The machine has a condenser temperature of 298 K while the evaporator temperature is 268 K . The relative efficiency of the machine is 50% and 6 kg of freon-12 refrigerant is circulated through the system per minute. The refrigerant enters the compressor with a dryness fraction of 0.6 specific heat of water is 4.187 kJ/kgK and the latent heat of ice is 335 kJ/Kg . Calculate the amount of ice produced in a day.
15. Draw a neat diagram of three fluid system of refrigeration (Electroflux Refrigerator) and explain its working.

Or

16. Draw a neat compact diagram of Lithium bromide water absorption refrigeration system and explain its working. List out the major fields of applications of this refrigeration system.
17. Describe the working of screw and rotary type compressors with sketch.

Or

18. Explain the working of a float valve. Compare the working of a float valve with Solenoid valve.
19. Explain in detail the factors to be taken into consideration while selecting an airconditioning system.

Or

20. Enumerate and explain the components of Cooling - load estimate.

(5 × 12 = 60 marks)

