

**3784**  
**BOARD DIPLOMA EXAMINATION, (C-09)**  
**MARCH/APRIL - 2019**  
**DIPLOMA IN MECHANICAL ENGINEERING**  
**REFRIGERATION & AIR CONDITIONING**  
**SIXTH SEMESTER EXAMINATION**

**Time: 3 Hours****Total Marks: 80**

**PART - A (10 x 3 = 30 Marks)**

*Note 1: Answer all questions and each question carries 3 marks*

*2: Answers should be brief and straight to the point and shall not exceed 5 simple sentences*

1. Represent the Reversed Carnot cycle on P-V and T- $\phi$  diagrams.
2. Air is compressed from 1.2 bar to 6 bar in a refrigeration system working on reversed Brayton cycle. Calculate the COP of the system. Assume isentropic compression and expansion. Take  $\gamma = 1.4$ .
3. Why is the ammonia water absorption system so popular?
4. Represent the VCR system on P-H diagram.
5. Write any three differences between two fluid & 3 fluid VAR systems.
6. What are the advantages of hermetically sealed compressors?
7. What are the functions of thermostatic expansion valve?
8. What is the function of thermostat in domestic refrigerator?
9. Differentiate between heating and cooling coils used in A/C.
10. Define a) Psychrometry b) Relative humidity

**PART - B (5 x 10 = 50 Marks)**

*Note 1: Answer any five questions and each question carries 10 marks*

*2: The answers should be comprehensive and the criteria for valuation is the content but not the length of the answer*

11. What quantity of ice at  $-5^{\circ}\text{C}$  can be made per hour by a refrigeration system whose capacity is 1.2 TR. The ice is to be made from water at  $20^{\circ}\text{C}$ . Specific heat of ice = 2.1 KJ/kgK, Latent heat of ice = 336 KJ/kgK and Specific heat of water = 4.2 KJ/kgK.
12. a) What are the advantages and disadvantages of Vapour absorption refrigeration system over Vapour compression refrigeration system.  
b) Find out the ideal COP of the system in which heating, cooling and refrigeration takes place at temperatures of  $100^{\circ}\text{C}$ ,  $30^{\circ}\text{C}$  and  $-15^{\circ}\text{C}$  respectively.
13. Explain the effects of a) superheating b) sub cooling of refrigerant on the performance of vapour compression refrigeration system.
14. Write short notes on Freon-12 and Freon-22.
15. Explain the working of evaporative condenser with neat diagram and write its advantages and disadvantages.
16. a) Illustrate the working of Propeller fan.  
b) List out the applications of air conditioning?

17. a) List out various psychrometric processes.  
b) Explain in detail the process of cooling and humidification with a neat sketch.
18. a) Describe the working of an air cooler with a neat sketch.  
b) Explain forced draft cooling tower with a neat sketch.

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