

**6639**  
**BOARD DIPLOMA EXAMINATION**  
**MARCH/APRIL - 2019**  
**DIPLOMA IN MECHANICAL ENGINEERING**  
**REFRIGERATION & AIR-CONDITIONING**  
**FIFTH SEMESTER EXAMINATION**

**Time: 3 Hours**

**Total Marks: 80**

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

*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. A reversed Carnot cycle refrigeration system works between the temperature limits of 40°C and -5°C. Calculate the COP of the system
2. What is the effect of undercooling on the following  
 (a) Compressor work                      (b) COP
3. State the purpose of flash chamber and accumulator in the vapour compression refrigeration system
4. Differentiate between the two fluid and three fluid refrigeration system
5. What is the function of drier in refrigeration system?. List out different types of driers
6. Draw the sketch of Shell and Tube evaporator
7. State any four applications of refrigeration
8. What is the comfort chart? What information can read from comfort chart
- \* 9. Draw the sketch of viscous air filter
10. Mention the advantages of unitary air conditioning system

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

*Note 1: Answer any five questions and each 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. Explain an Air Refrigeration System based on Bell-Coleman cycle. Indicate the cycle on P-V diagram

\*

[WWW.MANARESULTS.CO.IN](http://WWW.MANARESULTS.CO.IN)

12. The ammonia refrigeration plant works between the temperature limits of  $-15^{\circ}\text{C}$  to  $30^{\circ}\text{C}$ . The working fluid ammonia is assumed to be dry saturated at the end of compression. Calculate  
 (a) Refrigerating effect (b) COP

Temperature, $^{\circ}\text{C}$	Enthalpy, KJ/Kg		Entropy, KJ/KgK	
	Liquid, $h_f$	Vapour, $h_g$	Liquid, $S_f$	Vapour, $S_g$
$-15^{\circ}\text{C}$	112.2	1424.9	0.4564	5.5423
$30^{\circ}\text{C}$	322.6	1468.1	1.2017	4.9809

13. Explain the working of vapour absorption refrigeration system with the help of neat sketch
14. Explain the working of thermostatic expansion valve with the help of neat sketch.
15. (a) Explain the primary and Secondary refrigerants in details  
 (b) Explain the Thermodynamic properties of refrigerants
16. Explain the following duct systems  
 (a) Loop Perimeter duct system.  
 (b) Radial Perimeter duct system
17. The atmospheric conditions of air are specified by Dry bulb temperature is  $30^{\circ}\text{C}$  and humidity ratio is 15gms/Kg of air. Determine (a) Partial pressure of water vapour (ii) Relative humidity
18. Explain the following air conditioning systems with neat sketches  
 (a) Year Round Air conditioning system.  
 (b) Unitary Air conditioning system

- xxx -

\*

\*