



C09-M-606A

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BOARD DIPLOMA EXAMINATION, (C-09)

OCT/NOV—2015

DME—SIXTH SEMESTER EXAMINATION

REFRIGERATION AND AIR-CONDITIONING

Time : 3 hours]

[Total Marks : 80

PART—A

3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point.

1. State any three differences between open-air and closed-air refrigeration.
2. List out any six methods of refrigeration.
3. What is the function of flash chamber in a VCR system?
4. Sketch *T-* diagrams for vapour compression cycle when the vapour after compression is (a) wet, (b) dry and (c) superheated.
5. How vapour compression refrigeration system is better than the air refrigeration system?
6. Why is drier used before throttle valve or capillary tube?
7. How do you classify the compressors?

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8. Write any three differences between water-cooled and air-cooled condensers.
9. Why is filter used in air conditioning system?
10. Mention any three psychrometric processes.

PART—B

10×5=50

Instructions : (1) Answer *any five* questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. Explain the working of a Bell-Coleman refrigeration cycle with *P-V* and *T-* diagrams.

12. In a 15 TR ammonia refrigeration plant, the condensing temperature is 25 °C and evaporating temperature is -10 °C. The refrigerant is subcooled by 5 °C before passing through throttle valve. The vapour entering the compressor is dry saturated. Find (a) COP and (b) power required.

The properties of ammonia are

Temperature °C	Enthalpy, kJ/kg		Entropy, kJ/kg °k		Specific heats	
	<i>Liquid</i>	<i>Vapour</i>	<i>Liquid</i>	<i>Vapour</i>	<i>Liquid</i>	<i>Vapour</i>
25	536.35	1703.2	4.593	8.509	4.6057	2.805
-10	375.15	1669.35	4.016	8.994	—	—

13. (a) What are the differences between two-fluid and three-fluid absorption refrigeration system?

(b) Find out the ideal COP of the system in which heating, cooling and refrigeration takes place at temperatures of 110 °C, 25 °C and -12 °C respectively.

14. Write the properties of following refrigerants :

(a) Ammonia

(b) Brine

15. Describe cold storage with the help of a neat sketch.
16. (a) Explain the working of propeller fan with a neat figure.
(b) List out the applications of air conditioning.
17. (a) What is psychrometric chart? What are the uses of psychrometric chart?
(b) The atmospheric conditions are 30 °C and specific humidity of 12.5 grams/kg of air. Determine the following :
(i) Partial pressure of air
(ii) Relative humidity
(iii) DPT
18. Explain the Winter Air Conditioning System with a neat sketch.

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