



C09-M-606 A

3784

BOARD DIPLOMA EXAMINATION, (C-09)

SEPTEMBER/OCTOBER - 2020

DME—SIXTH SEMESTER EXAMINATION

REFRIGERATION AND AIR-CONDITIONING

Time : 3 hours ]

[ Total Marks : 80

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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 and shall not exceed *five* simple sentences.

1. Define refrigeration.
2. Show Carnot refrigeration cycle on  $P$ - $V$  and  $T$ - $S$  diagrams.
3. List out the basic components of vapour compression refrigeration system.
4. What are the effects of wet compression?
5. Mention the advantages of vapour absorption refrigeration system over VCR system.
6. How are refrigerants basically classified? Mention two examples for each.
7. Write any three differences between water-cooled condensers and air-cooled condensers.
8. What are the various types of evaporators?

- \* 9. State any three factors that affect the effective temperature.
10. Define the terms DBT and WBT.

**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 Bell-Coleman air refrigeration cycle with the help of  $P$ - $V$  and  $T$ - $S$  diagrams.
12. An ammonia refrigeration plant is working on VCR cycle between the temperature limits  $-15\text{ }^{\circ}\text{C}$  and  $30\text{ }^{\circ}\text{C}$ . The refrigerant is dry and saturated vapour at the end of compression. Determine (a) refrigeration effect and (b) COP of the system.

Use the following table for the properties of ammonia :

Temperature ( $^{\circ}\text{C}$ )	Liquid enthalpy, $h_f$ (kJ/Kg)	Vapour enthalpy, $h_g$ (kJ/Kg)	Liquid entropy, $S_f$ (kJ/KgK)	Vapour entropy, $S_g$ (kJ/KgK)
$-15\text{ }^{\circ}\text{C}$	112.17	1424.919	0.4564	5.5423
$30\text{ }^{\circ}\text{C}$	322.57	1468.09	1.2017	4.9809

13. Explain about the working of lithium-bromide VAR system with the help of a neat diagram.
14. Discuss about the working of solenoid valve with a neat diagram.
15. Explain about the working of water cooler with a neat diagram.
16. Explain about the loop perimeter and radial duct systems with neat diagrams.
- \* 17. List out various psychrometric processes. Explain any two of them.
18. Explain about the working of window air conditioner with a neat sketch.

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