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C16-M-503**6639****BOARD DIPLOMA EXAMINATION, (C-16)****OCTOBER/NOVEMBER—2023****DME - FIFTH 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 and shall not exceed five simple sentences.

1. Write any six methods of refrigeration. ½×6
2. State the purpose of accumulator in the vapour compression system. 3
3. List the basic components of vapour compression refrigeration system. 3
4. What is the function of analyser in vapour absorption system? 3
5. Write any three differences between water cooled condenser and air cooled condenser. 3
6. What is function of expansion device in refrigeration system? 3
7. State any three differences between primary and secondary refrigerants. 3
8. Give classification of air-conditioning systems. 3
9. List out different types of filters. Why filter is used in airconditioning system? 2+1
10. What is a unitary airconditioning system? 3

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PART—B

10×5=50

- Instructions :** (1) Answer *any five* questions.
 (2) Each question carries **ten** marks.
 (3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

- 11.** Explain air refrigeration system working on Bell-Coleman cycle with P-V and T-S diagrams. 10
- 12.** The ammonia refrigeration plant works between the temperature limits of $-20\text{ }^{\circ}\text{C}$ to $35\text{ }^{\circ}\text{C}$. The working fluid ammonia is assumed to be dry saturated at the end of compression. Calculate (a) refrigeration effect and (b) COP. 10

Properties of ammonia are as follows :

Temperature, $^{\circ}\text{C}$	Enthalpy, kJ/kg		Entropy, kJ/kgK	
	Liquid, h_f	Vapour, h_g	Liquid, S_f	Vapour, S_g
-20	89.78	1420.02	0.3684	5.6244
35	347.5	1471.43	1.2821	4.9302

- 13.** Explain the working of simple vapour absorption refrigeration system with a neat diagram. 10
- 14.** Explain the working of flooded type evaporator with a neat sketch. 10
- * **15.** Explain the working of domestic refrigerator with a neat sketch. 10
- 16.** Explain the working of following with a neat sketch :
- (a) Propeller fan 5
- (b) Centrifugal 5

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17. (a) Define the following terms :

(i) Dew point

(ii) Wet bulb temperature

(iii) Humidity ratio

(b) Show the cooling and dehumidification processes on psychrometric chart and explain in detail. 3+7

18. Explain the working of winter airconditioning system with a neat sketch. 10

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