C09–M–606A

3784

BOARD DIPLOMA EXAMINATION, (C–09)

MARCH/APRIL—2017

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 and shall not exceed *five* simple sentences.

1. Explain ice refrigeration with a neat sketch.

2. Explain the term 'ton of refrigeration'.

3. What are the advantages of vapour compression system over air refrigeration system?

4. What are the uses of analyzer and rectifier in a vapour absorption system?

5. What are the basic components of a simple vapour absorption refrigeration system?

6. What are the desirable properties of an ideal refrigerant?

7. What is the function of condenser? How do you classify condensers?

8. What are the uses of cold storage plant?

9. Why are filters used in air-conditioning system? List out different types of filters.

10. What is 'psychrometric chart'? State its uses.

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. *(a)* List out various methods of refrigeration and explain steam jet refrigeration with neat sketch. 6

(b) What are the advantages and limitations of air refrigeration? 4

12. In an ammonia refrigeration plant, temperature range is from –10 °C to 20 °C. Find the COP if vapour after compression is *(a)* 0·95 dry and *(b)* superheated to 35 °C at same pressure. Take specific heat of vapour as 2·65 kJ/kg K. The properties of ammonia are (assume that there is no subcooling) :

Temperature, °C	*Enthalpy*, kJ/kg		*Entropy*, kJ/kg K	
	Liquid	*Vapour*	*Liquid*	*Vapour*
–10	154	1450	0·8296	5·755
20	293·8	1479·8	1·3285	5·374

13. Explain the working principle of lithium-bromide-water absorption system with a neat sketch.

14. Explain the working of the following components with the help of a neat sketch : 5×2=10

(a) Vane type rotary compressor

(b) Refill type dryers

15. *(a)* Explain the working of shell and coil condenser with a neat sketch. 5

(b) Explain the working of solenoid valve with a neat sketch. 5

16. What are the different air distribution systems? Explain different arrangements in ejection system.

17. *(a)* List out various psychrometric processes. 4

(b) Describe humidification and dehumidification processes with a neat sketch. Plot the processes on psychrometric chart. 6

18. Explain the following with neat sketches : 5×2=10

(a) Central air-conditioning system

(b) Factors governing effective temperature (ET) conditions

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