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C09–M–606A

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BOARD DIPLOMA EXAMINATION, (C–09)

MARCH/APRIL—2016

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. Define *(a)* refrigeration, *(b)* air-conditioning.

2. Write the advantages and disadvantages of air refrigeration.

3. List any three desirable properties of refrigerant-absorbent pair.

4. How is vapour compression system better than the air refrigeration system?

5. Write any three disadvantages of wet compression in VCR system.

6 What is the function of an evaporator in a refrigeration system?

7. What is the function of analyser in VAR system?

8. Distinguish between primary and secondary refrigerants.

9. Define air-conditioning. What are the factors to be considered for air-conditioning?

10. Mention any three psychometric 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 steam-jet refrigeration with a neat sketch.

12. Draw the line diagram of practical vapour absorption refrigeration system and explain its principle.

13. A 5-ton Freon-12 refrigeration plant has evaporated temperature of –5 °C. The condensation takes place at 32 °C and there is no undercooling. Vapour is dry and saturated, when entering the compression. Find—

(a) COP of the plant;

(b) mass flow rate of refrigerant.

Take C_p for superheated vapour as 0·615 kJ/kgK. The properties of Freon -12 are.

		Enthalpy (kJ/kg)		
Pressure Bar	*Temperature* (°C)	*Liquid*	*Vapour*	*Entropy of vapour* (kJ/kgk)
7·85	32	130·5	264·5	1·542
2·61	–5	—	249·3	1·557

14. Explain the working principle of Ice plant with a neat line diagram.

15. Explain the working of rotating blade type rotary compressor with a neat sketch.

16. *(a)* Classify air filters and explain about a dry filter with neat sketch.

(b) Explain centrifugal dust collector with the help of neat sketch.

17. *(a)* Define the following terms : 4

(i) Dry bulb temperature

(ii) Wet bulb temperature

(iii) Dew point temperature

(iv) Relative humidity

(b) A sample of air has dry and wet bulb temperature of 35 °C and 25 °C respectively. The barometric pressure is 760 mm Hg. Calculate humidity ratio, relative humidity and enthalpy of sample. 6

18. *(a)* What are the advantages of a forced draft cooling tower over natural draft cooling tower?

(b) Illustrate the working principle of central A/C system.

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