



C09-M-606A

3784

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)		Entropy of vapour (kJ/kgk)
Pressure Bar	Temperature ($^{\circ}\text{C}$)	Liquid	Vapour	
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.
