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C14-M-602

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BOARD DIPLOMA EXAMINATION, (C-14)

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.  
(4) R and AC tables and psychrometric chart is permitted.

1. Define (a) refrigeration effect and (b) COP.
2. Write the advantages of vapour compression refrigeration system over air refrigeration.
3. Write the desirable properties of an ideal refrigerant.
4. How do you classify the compressors?
5. Write the desirable thermodynamic properties of refrigerant.
6. Define air-conditioning.

7. Define (a) DBT and (b) specific humidity.
8. Draw psychrometric processes on psychrometric chart.
9. What is meant by heating load in air-conditioning?
10. What are the leak testing methods?

**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) Write any five applications of refrigeration. 3  
 (b) An air-refrigeration plant working on Carnot cycle between the temperature limits of 34 °C and –10 °C requires 6.2 kW. Calculate the capacity of the plant in tons of refrigeration. 7
12. Explain the effect of subcooling and superheating of refrigerant on COP of VCR system with the help of P-H diagram. 10
13. (a) What are the differences between two-fluid and three-fluid vapour absorption systems? 6  
 (b) Write any four advantages of vapour absorption system over compression system. 4
14. Explain the evaporative condenser with a neat sketch. 10
15. Explain with a neat sketch the working of ice plant. 10
16. Classify air filters and explain about a dry-filter with a neat sketch. 10

17. The atmospheric conditions are 30 °C and specific humidity of 0.0125 kg/kg of air. Determine the following :

- (a) Partial pressure
- (b) Relative humidity
- (c) DPT
- (d) WBT
- (e) Specific enthalpy of moist air

Represent the above on the psychrometric chart. 10

18. Explain the winter air-conditioning system with the help of a neat sketch. 10

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