



C16-M-503

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BOARD DIPLOMA EXAMINATION, (C-16)

OCT/NOV—2018

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. Differentiate between the refrigerator and heat pump.
2. What are the advantages of vapour compression refrigeration system over air refrigeration system?
3. State the function of flash chamber in a VCR system.
4. What is the function of dehydrator in vapour absorption refrigeration system?
5. State the function of expansion device in a refrigeration system and classify expansion devices.
6. Write any six differences between axial compressor and centrifugal compressor.
7. Write any six chemical properties of refrigerants.

- * 8. Write any six factors that affects the human comfort.
- 9. Give detailed classification of air-conditioning systems.
- 10. State the advantages of unitary air-conditioning system.

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 Carnot refrigeration cycle absorbs heat at 270 K and rejects it at 300 K.

(a) Calculate the coefficient of performance of this refrigeration cycle.

(b) If the cycle is absorbing 1130 kJ/min at 270 K, how many kJ of work is required per second?

(c) If the Carnot heat pump operates between the same temperatures as the above refrigeration cycle, what is the coefficient of performance?

(d) How many kJ/min will the heat pump deliver at 300 K if it absorbs 1130 kJ/min at 270 K?

2+3+2+3=10

12. Explain the effect of the following factors on COP of vapour compression refrigeration system with the help of T-s diagram and h-s diagram :

(a) Subcooling

(b) Superheating

(c) Condenser pressure

(d) Evaporator pressure

13. Explain the working principle of lithium bromide vapour absorption refrigeration system with neat sketch.

- * 14. Explain the working principle of flooded-type evaporator with a neat sketch.
15. Explain the construction and working principle of cold storage plant with neat sketch.
16. Explain the following with neat sketches :
- (a) Propeller fan
 - (b) Tube axial fan
 - (c) Vane axial fan
17. Show the sensible cooling and sensible heating processes on psychrometric chart. Explain in detail.
18. Explain the working principle of year-round air-conditioning system with neat sketch.

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