

November 2022

Time - Three hours
(Maximum Marks: 75)

- [N.B.]** 1. Q.No. 8 in PART - A and Q.No. 16 in PART - B are compulsory. Answer any FOUR questions from the remaining in each PART - A and PART - B.
2. Answer division (a) or division (b) of each question in PART - C.
3. Each question carries 2 marks in PART - A, 3 marks in Part - B and 10 marks in PART - C.]

PART - A

1. What are the advantages of using hermetically sealed compressors?
2. What is the basic principle of condensers?
3. Define the terms (i) Refrigeration effect and (ii) COP
4. Discuss about the desirable properties of refrigerants.
5. Define sensible heat factor and by pass factor.
6. What do you mean by infiltration air load?
7. What is an air handling unit?
8. What is a comfort chart?

PART - B

9. State the laws of heat transfer.
10. Write about the working of an evaporator.
11. What are the effects of super heating and under cooling on COP?
12. State the applications of magnetic refrigeration systems.
13. Write about CFC refrigerants.
14. What are the uses of insulating materials in air conditioners?
15. Write about chilled water system.
16. Write about Variable refrigerant flow.

[Turn over.....

PART - C

17. (a) Explain the construction and working of a rotary compressor with neat sketches.

(Or)

- (b) Discuss about the types of cooling towers with neat sketches.

18. (a) Explain the principle of working of vapour compression refrigeration system with neat sketches. Analyse its performance using T-s and p-h charts.

(Or)

- (b) Explain the uses of flash chamber and accumulator with suitable examples.

19. (a) Explain the construction and working of (i) automatic expansion valve and (ii) thermostatic expansion valve with neat sketches.

(Or)

- (b) Explain about the process of ice making.

20. (a) Discuss about centrifugal dust collector with a neat sketch.

(Or)

- (b) Explain the construction and working of a window air conditioner system.

21. (a) Explain the classification of dust systems with neat sketches.

(Or)

- (b) The cross section of the main air supply duct of an air conditioning system is 800 mm X 600 mm. It carries 300 m³ / min of standard air. The duct is branched into two ducts of cross section 600 mm X 500 mm and 600 mm X 400 mm each. If the mean velocity in the larger branch is 450 m/min, then find (a) mean velocity of air in the main duct and the smaller branch and (b) mean velocity pressure in all the three ducts. Assume the mass density of standard air as 1.2 kg/m³.
