494 Register No.:

October 2018

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.

(4) Use of refrigeration tables and psychrometric charts are permitted]

PART – A

1. Define one ton of refrigeration.
2. Write the difference between natural and forced draught cooling towers.
3. What is meant by under cooling?
4. Write any two properties of SO_2 as refrigerant.
5. What is meant by freeze drying?
6. Define the term sensible heat factor.
7. What is meant by heat reclaim?
8. Name the three fluids used in electrolux system.

PART – B

9. An inventor claims to have developed a refrigerating machine maintains the space at -10°C. While operating at the room where the temperature is 20°C and has a COP of 9. Justify the claim is correct of not.
10. State and explain Fourier law of heat conduction.
11. Explain the effects of varying the condenser pressure.
12. Compare vapour compression system with vapour absorption system.
13. Write briefly about primary and secondary refrigerant.
14. What is meant by sensible heating? Show the process on a skeleton psychrometric chart.

15. Write short notes on infiltration air load.

16. Explain briefly VRF systems.

PART – C

17. (a) Explain with a neat sketch, the construction and working of evaporative condenser.

(Or)

(b) Explain in detail with a suitable sketch, the construction and working of forced circulation dry expansion type evaporator.

18. (a) An ammonia refrigerator works between -10°C and 38°C. It works under simple saturated cycle. C_p for liquid =4.75kJ/kgK, C_p for vapour=3.00kJ/kgK. Using the refrigeration tables, calculate (i)Power per ton of refrigeration. (ii)COP.

(Or)

(b) Explain with a neat sketch, the construction and working of solar absorption refrigeration system.

19. (a) Explain the working of thermostatic expansion valve with a neat sketch.

(Or)

(b) Explain with a neat sketch, the storage type water cooler.

20. (a) The atmospheric air at 30°C DBT and 75% RH enters a cooling coil at the rate of 100 m^3/min. The coil dew point temperature is 14°C and bypass factor is 0.1. Determine: (i) Temperature of air leaving the cooling coil (ii) Capacity of the cooling coil in TR. (iii) Amount of water vapour removed per min (iv) SHF for the process.

(Or)

(b) Explain with a neat sketch, the construction and working of window air conditioner.

21. (a) Explain in detail about the various heat loads that are considered in cooling load calculation.

(Or)

(b) Explain in detail about the equal pressure drop method of duct design.
