Register No.:

935

April 2023

Time - Three hours
(Maximum Marks: 100)

N.B.
1. Answer all questions under Part-A. Each question carries 3 marks.
2. Answer all the questions either (A) or (B) in Part-B. Each question carries 14 marks.
3. Standard Refrigeration tables are permitted.

PART - A

1. What is C.O.P of refrigerator?
2. What is a cooling tower?
3. Define the term refrigeration effect.
4. What are the uses of flash chamber?
5. What is a solenoid valve?
6. Define freeze drying?
7. What is relative humidity?
8. What is by pass factor?
9. Differentiate between fan and blower.
10. What is conduction heat load?

PART - B

11. (a) A Refrigerator is supplied with 10000 kg of fruits at a temperature of 20°C. The fish is to be cooled to -11°C for preserving it for a long period without deterioration. The cooling take place in 9.5hrs. The specific heat of fruits is 2.95 kJ/kgK above freezing point and 1.29 kJ/kgK below freezing point which is -3°C. The latent heat of freezing is 231.34 kJ/kg. Find the refrigerating capacity.

(Or)

(b) (i) Explain the construction and working principle of shell and tube type water cooled condenser with a neat sketch.(7)
(ii) Explain dry expansion evaporator with neat sketch.(7)

[Turn over....

12. (a) An ammonia vapour compression refrigerator has an effective swept volume of 0.312 m^3 per minute. Condensation and evaporation takes place at 30°C respectively. There is no under cooling and the gas temperature after compression is 52°C taking C_p for the superheated vapour as 2.95KJ/kgK. Determine
(i) The dryness fraction of the vapour as it enters the compressor.
(ii) The rate of circulation of ammonia in kg per minute.
(iii) The rate of extraction of heat in kJ/min.
(iv) The heat rejected in the condenser per minute.

(Or)

(b) Explain solar absorption refrigeration system with neat sketch.

13. (a) Explain the construction and working of automatic expansion valve with a neat sketch.

(Or)

(b) Explain the following:
(i) Cold storage (ii) Dairy refrigeration (iii) Ice cream cabinets.

14. (a) Explain any four psychrometric processes with neat sketch.

(Or)

(b) The air at 75% RH and 32°C DBT enters a cooling coil at the rate of 110m^3/min. The coil dew point temperature is 15°C and its BPF is 0.1. Find:
(i) Temperature of air leaving the cooling coil.
(ii) Amount of water vapour removed per min.
(iii) Capacity of the cooling coil in TR and KW.
(iv) S.H.F. of the process.

15. (a) (i) Explain the working of air washer dehumidifier with a neat sketch.(10)
(ii) What are the different types of insulating materials used for air - conditioning?(4)

(Or)

(b) An air - conditioned room is maintained at 27°C DBT and 50% RH when ambient conditions are 40°C DBT and 27°C WBT. The room sensible heat gain is 14 kW. The air enters the conditioned hall at 7°C DBT and saturated. Find,
(i) Volume of moist air supplied to the space in m^3/min.
(ii) Latent heat gain in the room in kW.
(iii) Cooling load of the air washer in kW if 30 % of the airsupplied to the room is fresh air and remaining 70 % is recirculated.
