

4. Specific enthalpy
5. Vapour Density
- (b) Explain in brief the following : (07)
(1) Filters
(2) Humidifiers used in air conditioning systems.
- Q-4 Attempt all questions (14)**
(a) A cold storage plant is required to store 20 tonnes of fish. The fish is supplied at a temperature of 30°C. The specific heat of fish above freezing point is 2.93 kJ/kg K. The specific heat of fish below freezing point is 1.26 kJ/kg K. The fish is stored in cold storage which is maintained at – 8°C. The freezing point of fish is – 4°C. The latent heat of fish is 235 kJ/kg. If the plant requires 75 kW to drive it, find (12)
(a) The capacity of the plant, and
(b) Time taken to achieve cooling.
Assume actual C.O.P. of the plant as 0.3 of the Carnot C.O.P.
(b) What do you understand by ‘cryogenics’? (02)
- Q-5 Attempt all questions (14)**
(a) Name three refrigerants that are commonly used in commercial refrigerants. Discuss their relative merits and demerits. (06)
(b) Explain Bell column cycle on P-V and T-S. List process involved. (06)
(c) What is the difference between a refrigerator and a heat pump? (02)
- Q-6 Attempt all questions (14)**
(a) A rectangular section 60 × 40 cm size made of sheet metal is used to carry 100 m³/min of air having a density of 1.2 kg/m³. Find the equipment diameter of circular duct if (07)
(a) Quantity carried if same in both the cases,
(b) If the same velocity in both cases if same.
Also find the pressure loss per 100 meter length of duct.
Take $f = 0.015$ for sheet metal.
(b) List the sources of sensible and latent heat gain in a Sedan car? (04)
(c) What are the factors that affect the heat transfer capacity of an evaporator? (03)
- Q-7 Attempt all questions (14)**
(a) Explain Boot-strap air evaporative cooling system with neat diagram. (06)
(b) What are different methods used for design of the ducts and explain any one. (06)
(c) What is aspect ratio? How does it effect on the performance of air conditioning? (02)
- Q-8 Attempt all questions (14)**
(a) Explain in brief testing, diagnosis and trouble shooting of automobile air conditioning system. (06)
(b) Explain automobile air cooling system with neat sketch. (06)
(c) Draw a neat sketch of Induced Draft Cooling Towers. (02)

