KERALA AGRICULTURAL UNIVERSITY

B.Tech (Agrl.Engg.) 2014 Admission

Vth Semester Final Examination-January-2017

Cat. No: **Phpt.3104.** Marks: **50.00**

Title: **Refrigeration and Air Conditioning(2+1)** Time: **2 hours**

I **Fill up the blanks/Define/Answer the following** **(10x1=10)**

1. COP of refrigeration is defined as the ratio of ----------
2. The thermodynamic cycle used by the air refrigeration system is ----------
3. The thermodynamic process used for expansion processes in vapour compression cycle is ----------
4. What are the four major parts of a vapour compression refrigeration unit
5. Production of very low temperature is known as ---------- Engineering
6. What is Psychrometric chart ----------
7. Define sensible heat factor
8. What is the difference between room sensible heat factor and grand sensible heat factor.
9. What is meant by aspect ratio in the duct design
10. Write any one method to reduce humidity in air

II **Write short notes/answers on any FIVE of the following** **(5x2=10)**

1. What is the difference between a refrigerator and heat pump?
2. Write some applications of refrigeration in food preservation.
3. What is meant by dry and wet compression?
4. Write some application of cryogenic refrigeration system.
5. What is by-pass factor of a cooling coil?
6. Write some applications of air conditioning in industries.
7. What is infiltered air?

III **Write short answers on any FIVE** **(5x4=20)**

1. Explain Bell Colemen cycle for refrigeration and derive an expression for COP.
2. Explain vapour compression refrigeration system with T-S and P-H diagram and write expression for COP.
3. Explain the method and effect of under cooling in vapour compression refrigeration system.
4. Explain automatic expansion device with the help of a neat sketch.
5. Explain Electrolux refrigeration system.
6. Write some method to reduce pressure drop in a duct design.
7. Explain steam jet refrigeration with the help of a neat sketch.

IV **Write essay on any ONE** **(1x10=10)**

1. An office for seating 30 occupants is to be maintained at 22°C DBT and 55% RH. The outdoor conditions are 36°C DBT and 27°C WBT. The various loads in the office are: Solar heat gain 8500W, sensible heat gain per occupant 83W, Latent heat per occupant 100W, Lighting load 2500W, Sensible heating load from other sources 12000W, Infiltration load 15m^3/minute. Assuming 40% fresh air and 60% re-circulated air passing through the evaporator coil and ADP of the coil is 8 degree centigrade. Find capacity of the plant and mass flow rate of air.
2. Explain Lithium-bromide absorption refrigeration system with the help of a neat sketch. Compare the system with vapour compression refrigeration system.

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