KERALA AGRICULTURAL UNIVERSITY
B.Tech.(Agrl. Engg.) 2022 & Previous admissions
V Semester Final Examinations - January 2025

Fape.3105 **Refrigeration and Air Conditioning (2+1)** **Marks: 50**
Time: 2 hours

I **Answer the following** **(10x1=10)**

1. Which law of Thermodynamics also called concept of Temperature?
2. One Tonn of refrigeration in kW?
3. Summer air conditioning systems follows which psychometry process?
4. Designation of Inorganic Refrigerant water is?

Fill in the blanks

5. Subcooling effect in VCR cycle .....(Increase/Decrease) the COP of the system.

State True or False

6. Efficiency of Carnot cycle is always 100 %.
7. In vapour absorption refrigeration systems generally use scroll type compressor.
8. Evaporator is the indoor unit of summer air conditioning systems.
9. Ammonia is not used as refrigerants in domestic appliances due to its toxic and inflammable nature.
10. Relative humidity of moist air represents the moisture absorbing capacity of air.

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

1. Explain the reverse Carnot cycle with suitable diagram.
2. Describe the steam jet refrigeration system.
3. What is wet bulb depression?
4. Describe the specific humidity of moist air.
5. Explain about the adiabatic saturation of moist air process.
6. Explain the working of humidifiers.
7. Describe the method of measurement of wet bulb temperature.

III **Answer ANY FIVE of the following** **(5x4=20)**

1. Explain the different types of compressors used in refrigeration systems.
2. Explain the working principle of Vapour absorption refrigeration systems with suitable diagram.
3. Describe any five thermophysical properties of refrigerants.
4. The working temperature in evaporator and condenser coils are -30 °C and 32 °C respectively. If the actual refrigerator has a coefficient of performance (COP) of 0.75 times of maximum COP. Find the power input for refrigeration capacity (RC) of 5 kW.
5. The degree of saturation of air at 30 °C is 24% and total atmospheric pressure is 100 kPa. The saturation pressure of vapour at 30 °C is 4 kPa. Then find relative humidity and specific humidity of air.
6. Describe the air distribution systems in air conditioning systems with suitable diagrams.
7. Explain about the cooling load calculations for summer air conditioning systems/cold storages.

IV **Write an essay on ANY ONE of the following** **(1x10=10)**

1. Explain the working principle of Vapour compression refrigeration cycle with each component's governing equations and diagrams.
2. Describe the different types of air conditioning systems in detail with their practical applications.

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