PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Summer 2018 - 19 Examination

Semester:6   Date: 07/05/2019
Subject Code: 03109356   Time:10:30pm to 01:00pm
Subject Name: Refrigeration and Air Conditioning for   Total Marks: 60
                Agricultural Engineering

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions – (15)
1. In VCR System, the effect of increase in condenser pressure ,on COP is
    (a) increase (b) decrease (c) doesn't affect (d) can't say
2. In VCR system , the lowest temperature in cycle occurs after
    (a) Compressor (b) Condenser (c) Expansion device (d) Evaporator
3. The designation of refrigerant CO_2 is
    (a) R 718 (b) R 744 (c) R 764 (d) R 717
4. The chemical formula of R150 is
    (a) CH_3Cl (b) $C_2H_4Cl_2$ (c) C_2H_4ClF (d) $CHCl_2F_2$
5. The chemical name of R170 is
    (a) Methane (b) Propane (c) Butane (d) Ethane
6. The condenser and compressor in split air condition are kept_____ the room.
7. _____ is used as a expansion device in domestic refrigerator.
8. The work requirement of reciprocating compressor is minimum when compression is ____
9. In VCR System , sub-cooling causes _____ in COP.
10. In VCR System ,decrease in evaporator pressure causes _____ in COP.
11. The RH value corresponding to ADP Temperature on Psychrometric chart is _____ %
12. Define Web Bulb Temperature.
13. Give Definition of Humidity Ratio.
14. Define the Relative Humidity
15. Define the term Degree of Saturation.

Q.2 Answer the following questions. (Attempt any three) (15)
    A) Describe simple Aqua Ammonia VAR System with neat sketch.
    B) Explain simple Li-Br Water VAR System.
    C) Write in brief about Simple VCR System with help of diagram.
    D) Explain Air Conditioning Plant and Thermal Energy Distribution System.

Q.3 A) R134a refrigeration system has evaporation and condensation temperatures, -20 ^{o}C and 40 ^{o}C (07) respectively. The refrigerant vapour is dry saturated at the suction of compressor and becomes superheated after compression. For one ton of refrigeration capacity, calculate (1) Refrigerating effect (2) Mass Flow Rate (3) Power (4) COP of the system.
    B) Write the desirable properties of ideal refrigerant. (08)
<div align="center">OR</div>
    B) Explain with neat sketch Steam-Jet Refrigeration system. (08)

Q.4 A) What are the methods of duct design? Explain any one method of duct design. (07)
<div align="center">OR</div>
    A) Explain various heat loads considered for cooling load calculations of a typical building. (07)

    B) The atmospheric air at 30°C DBT and 70 % RH enters a cooling coil at the rate of 200 m^3/min. The (08) coil DPT is 14 ^{o}C and the BF of coil is 0.1. Determine (1) The temperature of air leaving the cooling coil (2) Capacity of cooling coil in TR (3) SHF of coil.