R18 Regulation *Subject code:* 2P7CA

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

B. Tech VII Semester Supplementary Examinations, July 2022

REFRIGERATION AND AIR CONDITIONING

(MECHANICAL ENGINEERING)

Maximum Marks: 70 Date:02.07.2022 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10x2M=20 Marks)

1 What are the applications of refrigeration?
2 What is the difference between a refrigerator and a heat pump??
3 Give the advantages of hermetic sealed compressor?
4 How are condensers classified?
5 What are the components of vapor absorption refrigeration system?
6 Explain the principle of steam jet refrigeration system.
7 What do you understand by effective room sensible heat factor?
8 Difference between wet bulb temperature and dry bulb temperature
9 Classify air conditioning systems
10 Distinguish sensible and latent heat loads

Part-B

Answer All the following questions. (10MX 5=50Marks)

11 A. What is the difference between a refrigerator and a heat pump? Derive an expression for the performance factor for both if they are running on reversed Carnot cycle (5M)
B. Explain the importance of superheating vapors before suction to compressor. How does it affect COP of the system(5M)

OR

12 A. Discuss the effect of sub -cooling on COP. Would you desire large sub-cooling and Why (5M)
B. Draw the refrigeration cycle on Ts diagram when the refrigerant is dry and saturated at end of compression(5M)

13 A. Describe the working of an evaporative condenser (5M)

B Give the comparison of air-cooled condenser and water-cooled condenser(5M)

OR

14 A. Explain the working principle of thermostatic expansion valve with the help of a neat diagram. (5M)

B. What are the points to be considered for selecting a condenser for a refrigeration system? (5M)

15 A. What are the differences between vapor compression and absorption refrigeration systems? (5M)

B. Describe the working of Ammonia- water system(5M)

OR

16 A. Discuss the advantages of the dense air refrigerating system over an open air refrigeration system (5M)

B. Explain the various components of Steam Jet Refrigeration system and clearly discuss the function of each component. (5M)

17 A. Write a note on industrial air conditioning and requirements (5M)

B. Explain RSHF and ADP (5M)

OR

18 A. What are the important terms in a psychometric chart? Explain th**em.** (5M)

B . What do you understand by the term cooling load? What are the factors considered in load estimation sheet for comfort application? (5M)

19 A. Differentiate among split and central air conditioning system and explain different applications of these systems. (5M)

B. What do you understand by the term cooling load? What are the factors considered in load estimation sheet for comfort application? (5M)

OR

20 Air at 40^0C DBT and 15% RH is passed through the adiabatic humidifier at the rate of 200 m^3/ min. The outlet conditions of air are 25^0C DBT and 20^0C WBT. i) Dew point temperature

ii) Relative humidity of exit air

iii) Amount of water vapor added to the air per minute. (10M)