



Regulation R18

Subject code: 2P7CA

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VII Semester Supplementary Examinations, April 2024

REFRIGERATION & AIR CONDITIONING

(Mechanical Engineering)

Maximum Marks: 70

Date: 23.04.2024 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 10 questions. Answer any 5 questions 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 Distinguish between Heat Engine and Refrigerator.
- 2 List out the various processes in Vapor compression refrigeration cycle
- 3 What is the function of a condenser in a refrigeration system
- 4 What are the properties of ideal refrigerant?
- 5 What is the function of an absorber in vapor absorption refrigeration system
- 6 What is the meaning of air conditioning?
- 7 Define relative humidity
- 8 What is meant by Sensible cooling
- 9 What is the function of a filter in an air conditioning system
- 10 What is meant by dehumidification?

Part-B

Answer all the questions

(5X10M=50Marks)

- 11 A Carnot refrigerator operates between the temperatures of -500°C and 500°C . Determine COP of the refrigerator. If the COP is to be made 4 by changing the temperatures such that increase or decrease in upper temperature is equal to decrease or increase in lower temperature, determine the new temperatures. [10]
OR
- 12 Explain actual vapour compression cycle with help of T-S diagram. [10]
- 13 Explain with a neat sketch the working principle of Evaporative condenser. [10]
OR
- 14 a) What are the factors that affect the heat transfer capacity of an evaporator. [5]
b) With the help of a neat sketch describe the working of a thermostatic expansion valve. [5]
- 15 Explain the working of Ammonia-Hydrogen refrigerator. [10]
OR
- 16 Draw a neat line diagram of Electrolux refrigerator and explain its working principles. What is the important role of hydrogen in this refrigeration system? [10]

- 17 a) Explain the Grand Sensible Heat Factor (GSHF). [5]
b) What are the factors affecting optimum effective temperature. [5]
OR
- 18 a) Explain the cooling load. [3]
b) A room has a sensible heat gain of 26 KW and a latent heat gain of 8 KW and it has to be maintained at 26°C DBT and 50%RH. 180m³/min of air is delivered to the room. Determine the state of supply air. [7]
- 19 Differentiate between Central, District and Unitary air-conditioning systems. [10]
OR
- 20 Explain the centrifugal fan with the help of a neat diagram. [10]