R18 Regulation *Subject code: 2P7CA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VII Semester Supplementary Examinations, November 2023

REFRIGERATION AND AIR CONDITIONING

(Mechanical Engineering)

Maximum Marks: 70 Date:11.12.2023 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	Define the refrigeration process and what is tonne of refrigeration.	L1
2	Define the Coefficient of performance of a refrigerator.	L1
3	Draw the T-S diagram of actual vapour compression cycle.	L2
4	Write the effect of suction pressure in a actual vapour compression system?	L1
5	Mention various components used in Vapor absorption refrigeration system.	L2
6	What are the main advantages of vapor absorption system over vapor compression refrigeration system?	L1
7	Define dry bulb temperature and wet bulb temperature.	L1
8	What is meant by Sensible heating?	L1
9	List out the various components used in air conditioning.	L2
10	What is meant by dehumidification?	L1
	Part-B	
Answer All the following questions.	(5X10M=50Marks)	
11	a) With the help of neat sketches, differentiate between heat engine, refrigerator and heat pump. [5] b) With the help of T-S and P-h diagrams explain the effect of sub-cooling in vapor compression refrigeration cycle. [5]	L1 L1
	OR	
12	Explain actual vapour compression cycle with help of T-S diagram. [10]	L2
13	a) With the help of P-V and T-S diagrams derive an expression for the work done by a reciprocating compressor during isentropic compression. [5] b) Differentiate between the mechanical draft cooling towers and forced draft cooling towers. [5]	L2 L2
	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]	L1 L2

15	a) Write down the various advantages of Vapour absorption refrigeration system over Vapour compression refrigeration system. [5] b) With the help of a neat sketch explain the working of Ammonia-Hydrogen refrigerator. [5]	L2 L2
	OR	
16	Draw a neat diagram of lithium bromide water absorption system and explain its working. [10]	L2
17	a) Explain the following i) Room Sensible Heat Factor (RSHF) [3] ii) Grand Sensible Heat Factor (GSHF) [2] b) What are the factors affecting optimum effective temperature. [5]	L2 L1 L1
	OR	
18	a) What are the different factors considered in load estimation sheet for comfort application. [5] b) What is a fog? Show on psychometric chart when two air stream yield fogged state of air. [5]	L1 L1
19	a) Explain the various industrial application of air conditioning system. [5] b) Describe unitary and central air conditioning system. [5]	L2 L2
	OR	
20	a) Mention the various advantages and disadvantages of Steam humidifiers. [5] b) Describe a centrifugal fan with the help of a neat sketch. [5]	L2 L3