R18 Regulation *Subject code:2P7CA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VII Semester Supplementary Examinations, December 2024

REFRIGERATION & AIR CONDITIONING

(ME)

Maximum Marks: 70 Date:10.01.2025 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)		CO	Bloom Tx
1	Define the refrigeration process and what is tonne of refrigeration	1	L1
2	List out the various processes in Vapor compression refrigeration cycle	1	L1
3	What is the purpose of a compressor in Vapor compression refrigeration cycle	2	L1
4	Mention the various functions of an expansion device	2	L1
5	What is the function of an absorber in vapor absorption refrigeration system	3	L1
6	What is the basic function of compressor in vapour compression refrigeration system	3	L1
7	Define dry bulb temperature and wet bulb temperature	4	L1
8	What is meant by Sensible cooling	4	L1
9	What are the methods of obtaining humidification and dehumidification	5	L1
10	What is meant by dehumidification	5	L1
	Part-B		
Answer All the following questions. (5X10M=50Marks)		CO	Bloom Tx
11	a) With the help of neat sketches, differentiate between heat engine, refrigerator and heat pump. [5M] b) With the help of T-S and P-h diagrams explain the effect of sub-cooling in vapor compression refrigeration cycle. [5M]	1	L2
	OR		
12	1.5 KW per tonne of refrigeration is required to maintain the temperature of -40^0C in the refrigerator. If the refrigeration cycle works on Carnot cycle determine i) COP of the cycle ii) Temperature of the sink iii) Heat rejected to the sink per tonne of refrigeration iv) Heat supplied and EPR if the cycle is used as a heat pump. [10M]	1	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 polytropic compression. [5M]	2	L2

	b) Differentiate between the air cooled and water-cooled condensers.[5M]		
	OR		
14	a) What are the factors that affect the heat transfer capacity of an evaporator. [5M] b) With the help of a neat sketch describe the working of a thermostatic expansion valve. [5M]	2	L2
15	a) Explain the working of the Vapour absorption system. [5M] b) Derive the expression for the coefficient performance of an ideal vapour absorption system. [5M]	3	L2
	OR		
16	Draw a neat diagram of lithium bromide water absorption system and explain its working. [10M]	3	L2
17	a) Explain the following i) Cooling with adiabatic humidification ii) Heating and humidification [5M] b) What are the factors affecting optimum effective temperature. [5M]	4	L2
	OR		
18	a) What are the different factors considered in load estimation sheet for comfort application. [5M] b) What is a fog ? Show on psychometric chart when two air stream yield fogged state of air. [5M]	4	L2
19	a) Explain the various industrial application of air conditioning system. [5M] b) Describe unitary and central air conditioning system. [5M]	5	L2
	OR		
20	a) Mention the various advantages and disadvantages of Steam humidifiers. [5M] b) Describe a centrifugal fan with the help of a neat sketch. [5M]	5	L2