

GUJARAT TECHNOLOGICAL UNIVERSITY**BVOC - SEMESTER I – EXAMINATION – WINTER 2021****Subject Code:21110401****Date:19/03/2022****Subject Name:Basics of Refrigeration****Time:10:30 AM TO 12:30 PM****Total Marks:50****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		Marks
Q.1	(a) Define: Refrigeration, Refrigerant, Refrigerator, Refrigerating Effect, and Coefficient of Performance.	05
	(b) State and briefly explain the methods of Refrigeration.	05
Q.2	(a) Discuss the advantages of dense air refrigerating system over open air refrigeration system.	05
	(b) Explain in brief Carnot Cycle for refrigeration.	05
OR		
	(b) Explain units of refrigeration and define 1 Ton of Refrigeration.	05
Q.3	(a) Explain Air Refrigeration Cycle in detail.	05
	(b) Derive equation of COP for Air Refrigeration Cycle.	05
OR		
Q.3	(a) Draw schematic diagram of Bell-Coleman Cycle.	05
	(b) In a refrigeration plant working on Bell-Coleman cycle, air is compressed to 5 bar from 1 bar. Its initial temperature is 10 °C. After compression, the air is cooled up to 20 °C in a cooler before expanding back to pressure of 1 bar. Determine the theoretical C.O.P. of the plant and net refrigerating effect. Take $C_p = 1.005 \text{ KJ/kg K}$ and $C_v = 0.718 \text{ KJ/kg K}$.	05
Q.4	(a) Explain Standard Vapour Compression Refrigeration System with T-S and P-H diagram.	05
	(b) Explain effect of Sub cooling in detail.	05
OR		
Q.4	(a) Explain different methods of improving the COP of simple compression refrigeration cycle.	05
	(b) Why compression process is required in VCR system? Explain in brief.	05
Q.5	(a) Give comparison between Vapour compression and Vapour absorption refrigeration system.	05
	(b) What are the Function of following Components in VAR: 1. Absorber 2. Rectifier 3. Analyser 4. Heat Exchanger	05
OR		
Q.5	(a) Explain Construction and working of simple Ammonia-Water ($\text{NH}_3\text{-H}_2\text{O}$) vapour absorption system with neat sketch	05
	(b) What are the requirements of refrigerant-absorbent mixture to use it in vapour absorption system?	05
