Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VII EXAMINATION – WINTER 2025

Subject Code:3171919 Date:18-11-2025

Subject Name:Cryogenics Engineering

Time:10:30 AM TO 01:00 PM Total Marks:70

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)**	What do you mean by cryogenics engineering?	**03**
	(b)	Explain Type I and Type II superconductors.	**04**
	(c)	Discuss variations of Mechanical properties of material at Cryogenic temperature.	**07**
Q-2	**(a)**	Discuss physical hazards and its prevention.	**03**
	(b)	Explain the concept of ortho-hydrogen and para-hydrogen.	**04**
	(c)	Explain why MLI is better insulation than other insulation for cryogenics?	**07**
		OR	
	(c)	Discuss the unusual properties of liquid Helium-II.	**07**
Q-3	**(a)**	What is FOM?	**03**
	(b)	What are isothermal and isobaric source refrigeration cycles?	**04**
	(c)	Explain Precooled Linde Hampson system.	**07**
		OR	
Q-3	**(a)**	Describe principle of liquefaction.	**03**
	(b)	Discuss vacuum insulation.	**04**
	(c)	Explain J-T refrigeration system.	**07**
Q-4	**(a)**	How cryogenics is useful in biology?	**03**
	(b)	Explain the terms (i) Transition temperature and (ii) Critical current of superconductors.	**04**
	(c)	Discuss the application of cryogenics in various industrial applications.	**07**
		OR	
Q-4	**(a)**	Explain super conductive motors.	**03**
	(b)	Explain the mechanism of insulation in (a) Opacified powder insulation (b) Evacuated powder and fibrous insulation	**04**
	(c)	Discuss application of cryogenics in food preservation.	**07**
Q-5	**(a)**	Explain transfer of cryogenic fluid.	**03**
	(b)	Write the desirable features of regenerative heat exchanger of Philips refrigerator.	**04**
	(c)	Explain the storage equipment for cryogenic fluids.	**07**

OR

Q-5	**(a)**	Explain Metallic resistance thermometer used for cryogenic temperature measurement.	**03**
	(b)	Explain the importance of heat exchanger in cryogenics system.	**04**
	(c)	Explain construction and working of Turbine flow meter with figure.	**07**
