Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E –Ist SEMESTER–EXAMINATION – JULY- 2012

Subject code: 711004N **Date: 13/07/2012**

Subject Name: Elements of Cryogenic Engineering

Time: 2:30 pm – 05:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Define cryogenics. Discuss the importance of its.	**07**
	(b)	Discuss the change in any three mechanical properties at cryogenic temperature.	**07**
Q.2	**(a)**	Describe the salient features of super insulation. How all the modes of heat transfer are reduced to bare minimum for super insulation?	**07**
	(b)	Explain the following effect for helium II: i) Second sound ii) Fountain effect iii) superfluidity effect	**07**
		OR	
	(b)	Briefly discuss the insulation for small capacity liquid nitrogen laboratory dewar and large cryogenic storage vessels for liquid nitrogen.	**07**
Q.3	**(a)**	Describe with neat sketch thermodynamic Liquid-level gauge used in cryogenic service. What are the limitations of this gauge?	**07**
	(b)	Write note on fluid quality measurement.	**07**
		OR	
Q.3	**(a)**	Explain turbine flow meter.	**07**
	(b)	Write an exhaustive note on thermocouple thermometry in cryogenic range of temperatures.	**07**
Q.4	**(a)**	Write note on space simulation chamber.	**07**
	(b)	Discuss the applications of cryogenic in biology and medicine field. .	**07**
		OR	
Q.4	**(a)**	Write note on superconducting motor and gyroscopes.	**07**
	(b)	Explain cryogenic application in Rocket propulsion systems.	**07**
Q.5	**(a)**	Briefly mention steps to prevent accidents in cryogenic plants.	**07**
	(b)	Discuss the applications of cryogenics in food and organ preservation	**07**
		OR	
Q.5	**(a)**	Explain the safety aspects involve in cryogenic plants and equipments.	**07**
	(b)	Discuss about the physical and chemical hazards in cryogenic.	**07**

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