Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER II (NEW) – • EXAMINATION – SUMMER 2016

Subject Code: 2722110 **Date: 31/05/2016**

Subject Name: CRYOGENIC 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.**

Q.1	**(a)**	Explain the Significance of the following terms as related to the properties of metals at cryogenic temperature. (1) Strength to Weight Ratio (2) Strength to thermal conductivity ratio	**07**
	(b)	Explain the various phenomenon taking place with Helium Super Fluid	**07**
Q.2	**(a)**	Explain in detail Cryogenic Insulation used for Cryogenic Equipment	**07**
	(b)	Differentiate (1) Vaccum and Multilayer Insulation(2) Expanded and Foam Insulations	**07**
		OR	
	(b)	Explain the following phenomenon of superconductivity. (1) Meissner effect(2) Critical Current (3) Critical Flux Density.	**07**
Q.3	**(a)**	Explain the Super Conduction motor and Space Simulation Chamber	**07**
	(b)	Describe Application of Cryogenics in food Preservation	**07**
		OR	
Q.3	**(a)**	What do you understand by isothermal-source and isobaric-source system with reference to cryogenic refrigeration system? Compare both the systems.	**07**
	(b)	Explain pre-cooled Joule-Thomsan refrigeration system.	**07**
Q.4	**(a)**	Classify Cryocoolers. Write their contribution in the field of Cryogenics. State the main parameters to be considered while designing Cryocollers.	**07**
	(b)	Describe Sorption Compressor and Electrochemical Compressor used for Cryocoolers.	**07**
		OR	
Q.4	**(a)**	Explain G-M Type Pulse tube Cryocoolers.	**07**
	(b)	Describe mass flow rate and cooling capacity of J-T Cryocoolers briefly.	**07**
Q.5	**(a)**	Importance of Inversion Curve in Cryogenic Liquefaction system with neat sketch.	**07**
	(b)	Discuss the simple Linde-Hampson system for gas liquefactions.	**07**
		OR	
Q.5	**(a)**	Write shortnote on Cascade system for liquefactions.	**07**
	(b)	With a neat sketch explain the method of fluid quality measurement.	**07**

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