Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code: 2721007 Date: 31/05/2016

Subject Name: Low Temperature Measurement & Instrumentation

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 Significance of measurement briefly. Also explain in detail about Fundamental stages of measuring systems.	**07**
	(b)	Define : Sensitivity, Hysteresis, Repeatibility, Accuracy, Dead Zone, Threshold, Sensitivity	**07**
Q.2	**(a)**	List down the types of Errors that can occur during measurement. Discuss in detail about Systematic errors in measurement.	**07**
	(b)	Explain the working principle of piezoelectric transducer with neat sketch. Also state the method of calibration of transducers.	**07**
		OR	
	(b)	Explain the 3He Melting curve thermometer with neat sketch and clearly stating it's merits and demerits.	**07**
Q.3	**(a)**	Classify the flow measuring devices and explain Ultrasonic flow meter.	**07**
	(b)	List down the techniques for vacuum measurements. Discuss in detail about Mc Leod gauge for vacuum measurements.	**07**
		OR	
Q.3	**(a)**	Discuss in detail about Piezo electric Transducer for Pressure measurement. Also state its Advantages and Dis-Advantages.	**07**
	(b)	List down the various methods of cryogenic fluid flow measurement. Discuss in detail Turbine flow meters with neat sketch.	**07**
Q.4	**(a)**	Explain in detail about Sound measurement technique using Microphones.	**07**
	(b)	Discuss in detail with neat sketch about the concept thermometry for low temperature. Classify all the technique in brief.	**07**
		OR	
Q.4	**(a)**	State various methods used for density measurement write a note on density measurement by differential pressure (D/p) transmitter methods.	**07**
	(b)	Enlist the techniques used for Cryogenic Liquid Level measurements. Explain in detail about Movable Electric Resistance Liquid Level gauge.	**07**
Q.5	**(a)**	Explain working principles of (i) Noise thermometer (ii) Infrared thermometer with neat sketch.	**07**
	(b)	Write short note on fiber optics sensors.	**07**
		OR	
Q.5	**(a)**	Describe in brief about Electric noise measurement techniques.	**07**
	(b)	Explain ultrasonic techniques used for non destructive testing.	**07**

****