Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – III • EXAMINATION – WINTER 2012

Subject code: 731001 **Date: 30/12/2012**

Subject Name: Low Temperature Measurement and Instrumentation

Time: 10.30 am – 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)**	Define static characteristics of an instrument. Also state the difference between (i) Accuracy and Precision (ii) (ii) Span and Range (iii) Dead zone and Dead time	**07**
	(b)	Classify the types of various types of thermometers. Explain working of platinum wire resistance thermometer with neat sketch.	**07**
Q.2	**(a)**	Explain the 3He Melting curve thermometer with neat sketch. Also state merits and demerits of the same.	**07**
	(b)	Explain the working principle of piezoelectric transducer with neat sketch. Also state the method of calibration of transducers.	**07**
		OR	
	(b)	Classify the different types of transducers and explain the working of LVDT with neat sketch stating clearly merits and demerits.	**07**
Q.3	**(a)**	Explain how the capacitance level sensor is used for level measurement with neat sketch? Explain calibration of level measuring instruments.	**07**
	(b)	What are the different errors occurs in measurement? Explain each in detail. Also suggest the precautions to rectify the same.	**07**
		OR	
Q.3	**(a)**	Classify the flow measuring devices and explain (i) Ultrasonic flow meter. (ii) Electromagnetic flow meters.	**07**
	(b)	Explain the working principle of orifice and veturi flow meter and state the applications of the same.	**07**
Q.4	**(a)**	Explain McLeod Gauge for vacuum measurement. State its range, applications and merits and demerits.	**07**
	(b)	Enlist various techniques for sound measurement. Explain how the sound is measured with microphones.	**07**
		OR	
Q.4	**(a)**	Explain different types of sensors through which the pressure measurement is	**07**
Q.4	**(b)**	State various methods used for density measurement write a note on density measurement by differential pressure (D/p) transmitter methods.	**07**
Q.5	**(a)**	Explain working principles of (i) Noise thermometer (ii) Infrared thermometer with neat sketch.	**07**
	(b)	Write a short note on radiography as a non- destructive testing method.	**07**
		OR	
Q.5	**(a)**	Explain the calibration of temperature measuring devices. Also state errors and precautions in temperature measurement.	**07**
	(b)	Explain ultrasonic techniques used for non destructive testing.	**07**

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