Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – WINTER • 2014

Subject Code: 162005 Date: 03-12-2014

Subject Name: Electromechanical Measurements and Instruments

Time: 02:30 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)** Explain (i)hysteresis(ii)threshold(iii)dead zone giving examples. **07**

(b) Explain the basic construction, principle of operation of PMMC type instruments and derive its torque equation. **07**

Q.2 **(a)** What is 'Standardization'? Describe the process of standardization with the help of basic slide wire potentiometer. **07**

(b) Briefly discuss primary, secondary and tertiary measurements giving examples and block diagrams. **07**

OR

(b) Write a short note on 'systematic errors' giving examples. **07**

Q.3 **(a)** Explain with example and time response of(i)step input(ii)ramp input given to a first order system giving related equations. **07**

(b) Explain in detail the Magohm bridge for measurement of High Resistance with neat diagram. **07**

OR

Q.3 **(a)** In a test temperature is measured 100 times with variations apparatus and procedures.After applying the corrections ,the results are as shown in table. **07**

Temp.,^{0}c	397	398	399	400	401	402	403	404	405
Freq. of occurence	1	3	12	23	37	16	4	2	2

Calculate (a)arithmetic mean(b)mean deviation(c)standard deviation

(b) Describe different principle of operations of capacitive transducers with the help of suitable diagrams. **07**

Q.4 **(a)** Write a short note on 'Use of load cell for Force Measurement' giving neat sketch. **07**

(b) How a shaft power can be measured? Discuss any one method giving neat sketch. **07**

OR

Q.4 **(a)** State speed measurement instruments. Explain any one in detail with schematic diagram. **07**

(b) Define (i)true value(ii)static error(iii)static correction for an instrument giving examples. **07**

Q.5 **(a)** Explain construction and working principle of thermocouple and elaborate any one application of thermocouple briefly rather than measurement of temperature. **07**

(b) Describe the functional block diagram of digital data acquisition system in detail. **07**

OR

Q.5 **(a)** Explain in detail the difficulties in measurement of high resistance. **07**

(b) Describe in detail the construction and working principle of attraction type and repulsion type moving iron instruments with neat diagrams. **07**

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