Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–II • EXAMINATION – WINTER 2013

Subject Code: X20902 Date: 23-12-2013

Subject Name: Electrical Measurement I & II

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)**	Derive the dimensions of a) e.m.f., b) magnetic flux density, c) electric flux density, d) current density, e) permeability, f) permittivity, g)resistivity in L,M,T,I system of dimensions.	**7**
	(b)	Explain construction and working of PMMC instruments.	**7**
Q.2	**(a)**	Describe the constructional details and working of the electrodynamometer type instrument. How dynamometer type instrument is used as an ammeter, voltmeter and wattmeter?	**7**
	(b)	Explain construction and working of DArsonval Galvanometer with neat sketch.	**7**
		OR	
	(b)	Show that in two wattmeter method of power measurement for 3-Ø balanced load system, the total power consumed is the sum of reading of two watt meters.	**7**
Q.3	**(a)**	Explain working principle of Slide wire D.C. potentiometer. Also explain how it is standardized.	**7**
	(b)	Derive the torque equation for induction type single phase energy meter.	**7**
		OR	
Q.3	**(a)**	Explain Maxwell's inductance capacitance bridge with connection diagram and phasor diagram also state balance condition for the same.	**7**
	(b)	Describe working of low voltage Schering bridge. Derive equation of capacitance and dissipation factor	**7**
Q.4	**(a)**	Describe Wein's Bridge and derive the expression of frequency in terms of its parameters.	**7**
	(b)	Draw the circuit of Kelvin's double bridge used for measurement of low resistance. Derive the condition for balance.	**7**
		OR	
Q.4	**(a)**	State the methods for measurement of high resistance and Explain the construction and working of meggar.	**7**
	(b)	Describe De Sauty's Bridge and derive the equation for the same.	**7**
Q.5	**(a)**	Draw the equivalent circuit and phasor diagram of a current transformer. Derive the expression for ratio and phase angle errors.	**7**
	(b)	Draw the circuit of a Wheatstone bridge and derive the condition of balance.	**7**
		OR	
Q.5	**(a)**	Draw the circuit diagram of a Crompton's potentiometer and explain its working.	**7**
	(b)	Describe the construction and operation of 1-Ø induction type energy meter.	**7**

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