Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-III Regular / Remedial Examination December 2010

Subject code: 130903

Subject Name: Electrical & Electronics Measuring Instruments

Date: 18 /12 /2010 **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 the following terms: (1) Accuracy (2) Precision (3) Resolution (4) Drift	**04**
	(b)	The pull of an electromagnet is given by expression $P \alpha B^a A^b \mu_0^c$ Where B = flux density in air gap A = area of electromagnets μ_0 = permeability of air gap Determine values of a, b,& c from the dimensions of quantities involved	**05**
	(c)	Explain errors in single phase energy meter	**05**
Q.2	**(a)**	Explain construction & working of a D' Arsonval Galvanometer	**07**
	(b)	Draw the circuit diagram of a Crompton's Potentiometer & explain its working. Describe the steps used when measuring an unknown resistance.	**07**
		OR	
	(b)	Explain construction & working of PMMC Instrument	**07**
Q.3	**(a)**	Give classification of analog instruments	**06**
	(b)	Describe with a circuit diagram operation of an electronic voltmeter used in differential amplifier.	**08**
		OR	
Q.3	**(a)**	Explain briefly Weston Frequency Meter	**06**
	(b)	Explain True RMS Reading Voltmeter	**08**
Q.4	**(a)**	Write short notes on following (1) Absolute measurement of resistance (2) Maximum Demand Indicator	**14**
		OR	
Q.4	**(a)**	Explain with a neat diagram working of a Synchroscope	**07**
	(b)	Explain constructional details & working of an Electrodynamometer type 3-ph. p.f. meter	**07**
Q.5	**(a)**	Explain errors in Electrodynamometer type wattmeter	**04**
	(b)	Explain how power can be measured in a 3- ph circuit with the help of two wattmeter	**06**
	(c)	A 3-ph 500V motor load has a p.f of 0.4. Two wattmeters connected to measure the input. The input to be 30kW. Find the reading of each wattmeter	**04**
		OR	
Q.5	**(a)**	State advantages of Electronic Voltmeter over Conventional Voltmeter	**04**
	(b)	Derive expression for Deflecting torque of a single phase induction type meter	**05**
	(c)	In the measurement of power by a polar potentiometer the following readings were obtained Voltage across a 0.2 Ω standard resistance in series with the load = $1.46 \angle 32^0$. Voltage across a 200:1 potential divider across the line = $1.37 \angle 56^0$ V. Estimate the current, voltage, power & power factor of the load.	**05**

****