Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. Sem. - V - Examination – June- 2011

Subject code: 152402

Subject Name: Electrical Measurements & Electronics Instruments

Date:22/06/2011 **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 Precision, accuracy, resolution and fidelity, and give classification of measuring instruments on the basis of operating principle.	**07**
	(b)	Why the instrument transformers are used ? Explain the effect of secondary winding Burden on errors in CT.	**07**
Q.2	**(a)**	Explain Maxwell's bridge with necessary diagrams.	**07**
	(b)	A PMMC instrument has FSD of 100μA and a coil resistance of 1K. Calculate the required shunt resistance value to convert the instrument into an ammeter with (1)FSD=100mA & (2)FSD=1A.	**07**
		OR	
	(b)	Derive dimensions for charge, current and EMF using ε (permittivity) as forth fundamental dimension.	**07**
Q.3	**(a)**	Three resistors have the following ratings: R1=37±5% Ω, R2= 75±5% Ω, R3= 50±5% Ω. Determine the magnitude and limiting error in ohm and in percent of the resistance of these resistances connected in series.	**07**
	(b)	Give comparison of PMMC and MI instruments.	**07**
		OR	
Q.3	**(a)**	What is the importance of damping in measuring instruments ? Explain various means to provide damping torque.	**07**
	(b)	Explain various types of errors which occurs in measurement.	**07**
Q.4	**(a)**	Give construction and working of 1-Ø induction type energy meter	**07**
	(b)	Explain Op-Amp voltage follower voltmeter.	**07**
		OR	
Q.4	**(a)**	Explain two wattmeter method for measurement of power in poly phase system.	**07**
	(b)	Explain rectifier type ammeter.	**07**
Q.5	**(a)**	Derive the expression for the measurement of unknown resistance with the help of Wheatstone bridge.	**07**
	(b)	Explain Dual-slope integrator type digital voltmeter	**07**
		OR	
Q.5	**(a)**	Explain the sources of errors in measuring instruments.	**07**
	(b)	Explain the effect of Open Secondary in a Current Transformer.	**07**

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