Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – SUMMER • 2014

Subject Code: 152402 Date: 13-06-2014

Subject Name: Electrical Measurement & Electronics Instrument

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)**	Explain principle and operation of PMMC instrument. Derive torque equation for it.	**07**
	(b)	Explain the classification of Electrical and Electronics Instruments.	**07**
Q.2	**(a)**	Explain the construction and working of Electrodynamometer type instruments.	**07**
	(b)	Explain construction, principle and operation of D'Arsonval Galvanometer. Derive torque equation for it.	**07**
		OR	
	(b)	State various types of errors in potential transformer. Explain how they can be reduced.	**07**
Q.3	**(a)**	With neat diagram explain construction and operation of single phase energy meter.	**07**
	(b)	A moving coil ammeter has a fixed shunt of 0.02 ohm. With a coil resistance of R=1000ohm and a potential difference of 500mV across it, full scale deflection is obtained (a) To what shunted current does this correspond?(b)Calculate the value of R to give full scale deflection when shunted current I is (i)10A(ii)75A and (c) With what value of R is 40% deflection obtained with I=100A?	**07**
		OR	
Q.3	**(a)**	Explain the construction and characteristics of CT with its equivalent circuit and necessary phasor diagram.	**07**
	(b)	Calculate the Q factor and effective resistance of a circuit tuned to a frequency of 1.5MHz and having an effective capacitance of 150pF.In this circuit the current falls to 70.7% of its resonant value when the frequency of an emf of constant magnitude injected in series with the circuit deviates from the resonant frequency by 5kHz.	**07**
Q.4	**(a)**	Explain the classification of resistance. List the methods for measurement of low resistance. Explain Kelvin Double Bridge using circuit diagram and necessary equation.	**07**
	(b)	Explain De Sauty Bridge using necessary circuit diagram, phasor diagram and equation.	**07**
		OR	
Q.4	**(a)**	Explain Op-Amp voltage follower voltmeter.	**07**
	(b)	Explain working principle of rectifier type ammeter in detail.	**07**
Q.5	**(a)**	Give different accessories for measuring instruments. Explain 1) RF demodulator probes 2) current probes.	**07**
	(b)	Explain Maxwell's bridge with necessary diagrams.	**07**
		OR	
Q.5	**(a)**	Draw basic block diagram of a digital frequency meter. Discuss each block in details.	**07**
	(b)	Define Q factor of Inductor. Explain the working of Digital LCR Meter with neat Block diagram.	**07**

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