Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III EXAMINATION – SUMMER 2016

Subject Code:130903 **Date:27/05/2016**

Subject Name:Electrical and Electronics Measuring Instruments

Time:10:30 AM to 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)**	Describe the construction and characteristics of a weston unsaturated cells used as emf standard.	**07**
	(b)	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.	**07**
Q.2	**(a)**	Define and explain in brief the following terms related to measurement system : (i) Accuracy (ii) Resolution (iii) Precision (iv) Sensitivity	**07**
	(b)	Describe the construction and working of a PMMC instrument. Mention the method of damping used in this instrument.	**07**
		OR	
	(b)	Explain the construction and working of thermocouple instruments.	**07**
Q.3	**(a)**	Define the terms 'current sensitivity', 'voltage sensitivity' and 'megohm sensitivity' as applied to d'Arsonval galvanometers. Explain how current sensitivity of a galvanometer can be increased?	**07**
	(b)	Give short note on extension of range of instrument.	**07**
		OR	
Q.3	**(a)**	What is a volt-ratio box? Explain briefly.	**07**
	(b)	Explain with a neat diagram working of a Synchroscope.	**07**
Q.4	**(a)**	Describe the constructional detail of single phase induction type energy meter.	**07**
	(b)	With a suitable circuit diagram explain the construction and write steps that are used for measurement of unknown emf by crompton's potentiometer.	**07**
		OR	
Q.4	**(a)**	Explain how the following adjustments are made in a single phase induction type energy meter. (i) Lag adjustment (ii) Creeping	**07**
	(b)	Describe the construction and working of a drysdale polar type potentiometer. Also discuss how is it standardized?	**07**
Q.5	**(a)**	Explain the various factors which are taken in to consideration while selecting an electronic type analog voltmeter.	**07**
	(b)	Explain the constructional details and working of a three phase electrodynamometer type power factor meter. Prove that the displacement of moving system is equal to the phase angle of the system.	**07**
		OR	

Q.5	**(a)**	Explain the circuit diagram and operation of an electronic voltmeter using a differential amplifier. Derive its equivalent circuit and find the expression for the current flowing through the meter.	**07**
	(b)	Describe the constructional details and working of a weston frequency meter.	**07**

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