

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 : **07**
(i) Accuracy (ii) Resolution (iii) Precision (iv) Sensitivity
- (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 electro-dynamometer 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**
