

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III(New) • EXAMINATION – WINTER 2016****Subject Code:2130903****Date:06/01/2017****Subject Name:Electrical Measurement and 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.

		MARKS
Q.1	Short Questions	14
	1 Define true value.	
	2 Define resolution.	
	3 Define drift.	
	4 Define sensitivity.	
	5 List out the various methods of providing damping torque in an indicating instrument	
	6 State application of instrumentation amplifier.	
	7 List out different errors in wattmeter.	
	8 What is Guard circuit?	
	9 State methods for measurement of high resistances.	
	10 Define energy.	
	11 State application of strip chart recorder.	
	12 What is a wave analyzer?	
	13 Define telemetry.	
	14 Define active transducer.	
Q.2	(a) Explain two wattmeter method used to measure power of a 3-phase balanced load.	03
	(b) Describe the various types of errors in measurement system.	04
	(c) Describe the constructional detail of an attraction type moving iron instrument with help of diagram. Derive the equation for deflection if spring control is used.	07
OR		
	(c) Prove that deflection of electro-dynamometer type wattmeter is proportional to power consumed.	07
Q.3	(a) Describe the construction and working of thermocouple instrument.	03
	(b) Explain the electro-dynamometer type wattmeter.	04
	(c) Draw the circuit of a Kelvin's Double Bridge used for measurement of low resistance. Derive the condition for balance.	07
OR		
Q.3	(a) Define the terms "Indicating instruments", "Recording instruments" and "Integrating instruments". Give suitable example for each case.	03
	(b) Draw neat sketch of single phase electro-dynamometer type power factor meter. Explain its working.	04
	(c) Derive the expression for bridge sensitivity for a Wheatstone Bridge with equal arms. Find also the expression for current through the galvanometer for small unbalance.	07
Q.4	(a) Explain working principal of Q meter.	03
	(b) Describe how to make extension of range of voltmeter.	04
	(c) Derive the equations of balance for Anderson bridge. Draw the phasor diagram for conditions under balance.	07

OR

- Q.4** (a) Explain with diagram, the bonded type of strain gauge. **03**
(b) Explain the function of following component in induction type energy meter. **04**
(i) Driving system (ii) Moving system (iii) Breaking system (iv) Counting mechanism
(c) Derive the equations of balance for Owen's bridge. Draw the phasor diagram for conditions under balance. **07**
- Q.5** (a) Explain the working of digital volt meter with schematic block diagram. **03**
(b) What are the different types of telemetry system? Explain any one system. **04**
(c) Explain the construction and principle of working of a linear variable differential transformer (L.V.D.T). **07**

OR

- Q.5** (a) Describe digital storage oscilloscope with schematic block diagram. **03**
(b) Explain the term "Total harmonic distortion" and describe Tuned circuit harmonic analyzer. **04**
(c) Explain the principle of operation and construction of RTD. **07**
