

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER– III (New) EXAMINATION – WINTER 2019****Subject Code: 2130903****Date: 3/12/2019****Subject Name: Electrical Measurement and Measuring Instruments****Time: 02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		<b>MARKS</b>
<b>Q.1</b>	(a) Explain CT and PT.	<b>03</b>
	(b) Explain electro-dynamometer type wattmeter.	<b>04</b>
	(c) Explain Maxwell's inductance-capacitance bridge for measurement of inductance. Derive bridge balance equation and draw vector diagram.	<b>07</b>
<b>Q.2</b>	(a) What is a transducer? Give classifications of transducer.	<b>03</b>
	(b) Explain LVDT.	<b>04</b>
	(c) Derive the bridge balance equation of anderson's bridge and also provide advantages, dis-advantages & limitations of it.	<b>07</b>
<b>OR</b>		
	(c) Derive the bridge balance equation of hay's bridge and also provide advantages & dis-advantages of it.	<b>07</b>
<b>Q.3</b>	(a) Explain block diagram of a general telemetry system.	<b>03</b>
	(b) Explain principle of operation of thermo couple instrument.	<b>04</b>
	(c) Describe the constructional detail of attraction type moving iron instruments with help of diagram. Also derive equation of deflection if spring control is used.	<b>07</b>
<b>OR</b>		
<b>Q.3</b>	(a) State the applications of power analyzers.	<b>03</b>
	(b) Explain controlling systems used in an instrument.	<b>04</b>
	(c) Derive the equation for gauge factor of a resistive strain gauge in terms of Poisson's ratio.	<b>07</b>
<b>Q.4</b>	(a) Define the following terms: i) Accuracy, ii) Sensitivity, iii) Threshold	<b>03</b>
	(b) Explain any one pressure measurement techniques in detail.	<b>04</b>
	(c) Explain construction, working advantages and disadvantages of RTD with neat diagram.	<b>07</b>
<b>OR</b>		
<b>Q.4</b>	(a) Explain DMM with schematic diagram.	<b>03</b>
	(b) Explain the various effects with which deflecting torque is produced.	<b>04</b>
	(c) Describe digital storage oscilloscope with schematic block diagram and state its applications.	<b>07</b>
<b>Q.5</b>	(a) Define drift, sensitivity and true value.	<b>03</b>
	(b) Explain the term "Total harmonic distortion" and describe Tuned circuit harmonic analyzer.	<b>04</b>
	(c) Prove that deflection of electro-dynamometer type wattmeter is proportional to power consumed.	<b>07</b>
<b>OR</b>		
<b>Q.5</b>	(a) Explain the loss of charge method for measurements of high resistance.	<b>03</b>
	(b) Distinguish clearly between accuracy and precision.	<b>04</b>
	(c) Explain construction and working of Megger.	<b>07</b>

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