



GANDHI SCHOOL OF ENGINEERING

BHABANDHA, BERHAMPUR

BRANCH:- ELECTRICAL ENGINEERING

SEMESTER:- 4th

SUBJECT:- ELECTRICAL MEASUREMENT & INSTRUMENTATION

NAME OF FACULTY-ER.P.P MAHUNTA &ER.BINAYAK DASH

		Topic to be taken			Actual topic taken				
SL. No	Topic/Module	No. of period	Details of the topics	Date	Topic No.	Topic Name	Date	Remarks	
1	MEASURING INSTRUMENTS	05	1.1 Define Accuracy, precision, Errors, Resolutions Sensitivity and tolerance. 1.2 Classification of measuring instruments. 1.3 Explain Deflecting, controlling and damping arrangements in indicating type of instruments. 1.4 Calibration of instruments.	13.02.2023 TO 17.02.2023	1.2 1.2 1.3 1.4	1.1 Define Accuracy, precision, Errors, Resolutions Sensitivity and tolerance. 1.2 Classification of measuring instruments. 1.3 Explain Deflecting, controlling and damping arrangements in indicating type of instruments. 1.4 Calibration of instruments.	13.02.2023 14.02.2023 15.02.2023 16.02.2023 17.02.2023		
2	ANALOG AMMETERS AND VOLTMETERS	10	2.1. Describe Construction, principle of operation, errors, ranges merits and demerits of: 2.1.1 Moving iron type instruments. 2.1.2 Permanent Magnet Moving coil type instruments. 2.1.3 Dynamometer type instruments 2.1.4 Rectifier type instruments	18.02.2023 TO 03.03.2023	2.1 2.1.1 2.1.2 2.1.3 2.1.4 2.1.5 2.2 2.3	2.1. Describe Construction, principle of operation, errors, ranges merits and demerits of: 2.1.1 Moving iron type instruments. 2.1.2 Permanent Magnet Moving coil type instruments. 2.1.3 Dynamometer type instruments 2.1.4 Rectifier type instruments 2.1.5 Induction type instruments 2.2 Extend the range of instruments	18.02.2023 19.02.2023 22.02.2023 23.02.2023 24.02.2023 27.02.2023 28.02.2023 01.03.2023 02.03.2023		

			2.1.5 Induction type instruments 2.2 Extend the range of instruments by use of shunts and Multipliers. 2.3 Solve Numerical			by use of shunts and Multipliers. 2.3 Solve Numerical	03.03.2023	
3	WATTMETERS AND MEASUREMENT OF POWER	08	3.1 Describe Construction, principle of working of Dynamometer type wattmeter. (LPF and UPF type) 3.2 The Errors in Dynamometer type wattmeter and methods of their correction. 3.3 Discuss Induction type watt meters.	05.03.2023 TO 20.03.2023	3.1 3.2 3.3	3.1 Describe Construction, principle of working of Dynamometer type wattmeter. (LPF and UPF type) 3.2 The Errors in Dynamometer type wattmeter and methods of their correction. 3.3 Discuss Induction type watt meters.	05.03.2023 09.03.2023 10.03.2023 14.03.2023 15.03.2023 16.03.2023 17.03.2023 20.03.2023	
4	ENERGYMETERS AND MEASUREMENT OF ENERGY	08	4.1 Introduction 4.2 Single Phase Induction type Energy meters – construction, working principle and their compensation & adjustments. 4.3 Testing of Energy Meters.	21.03.2023 TO 03.04.2023	4.1 4.2 4.3	4.1 Introduction 4.2 Single Phase Induction type Energy meters – construction, working principle and their compensation & adjustments. 4.3 Testing of Energy Meters.	21.03.2023 22.03.2023 23.03.2023 24.03.2023 27.03.2023 28.03.2023 03.04.2023 03.04.2023	

5	MEASUREMENT OF SPEED, FREQUENCY AND POWER FACTOR	07	<p>5.1 Tachometers, types and working principles</p> <p>5.2 Principle of operation and construction of Mechanical and Electrical resonance Type frequency meters.</p> <p>5.3 Principle of operation and working of Dynamometer type single phase and three phase power factor meters.</p>	<p>04.04.2023 TO 13.04.2023</p>	<p>5.1 5.2 5.3</p>	<p>5.1 Tachometers, types and working principles</p> <p>5.2 Principle of operation and construction of Mechanical and Electrical resonance Type frequency meters.</p> <p>5.3 Principle of operation and working of Dynamometer type single phase and three phase power factor meters.</p>	<p>04.04.2023 05.04.2023 06.04.2023 10.04.2023 11.04.2023 12.04.2023 13.04.2023</p>	
6	MEASUREMENT OF RESISTANCE, INDUCTANCE & CAPACITANCE	08	<p>6.1 Classification of resistance</p> <p>6.1.1. Measurement of low resistance by potentiometer method. .</p> <p>6.1.2. Measurement of medium resistance by wheat Stone bridge method.</p> <p>6.1.3. Measurement of high resistance by loss of charge method.</p> <p>6.2 Construction, principle of operations of Megger & Earth tester for insulation resistance and earth resistance measurement respectively.</p> <p>6.3 Construction and principles of Multimeter. (Analog and Digital)</p> <p>6.4 Measurement of inductance by Maxwell's Bridge method.</p> <p>6.5 Measurement of capacitance by Schering Bridge method</p>	<p>17.04.2023 TO 03.05.2023</p>	<p>6.1 6.1.1 6.1.2 6.1.3 6.2 6.3 6.4 6.5</p>	<p>6.1 Classification of resistance</p> <p>6.1.1. Measurement of low resistance by potentiometer method. .</p> <p>6.1.2. Measurement of medium resistance by wheat Stone bridge method.</p> <p>6.1.3. Measurement of high resistance by loss of charge method.</p> <p>6.2 Construction, principle of operations of Megger & Earth tester for insulation resistance and earth resistance measurement respectively.</p> <p>6.3 Construction and principles of Multimeter. (Analog and Digital)</p> <p>6.4 Measurement of inductance by Maxwell's Bridge method.</p> <p>6.5 Measurement of capacitance by Schering Bridge method</p>	<p>17.04.2023 18.04.2023 19.04.2023 20.04.2023 21.04.2023 26.04.2023 27.04.2023 28.04.2023 29.04.2023 01.05.2023 02.05.2023 03.05.2023</p>	

7	SENSORS AND TRANSDUCER	09	<p>7.1. Define Transducer, sensing element or detector element and transduction elements.</p> <p>7.2. Classify transducer. Give examples of various class of transducer.</p> <p>7.3. Resistive transducer</p> <p>7.3.1 Linear and angular motion potentiometer.</p> <p>7.3.2 Thermistor and Resistance thermometers.</p> <p>7.3.3 Wire Resistance Strain Gauges</p> <p>7.4. Inductive Transducer</p> <p>7.4.1 Principle of linear variable differential Transformer (LVDT)</p> <p>7.4.2 Uses of LVDT.</p> <p>7.5. Capacitive Transducer.</p> <p>7.5.1 General principle of capacitive transducer.</p> <p>7.5.2 Variable area capacitive transducer.</p> <p>7.5.3 Change in distance between plate capacitive transducer.</p> <p>7.6. Piezo electric Transducer and Hall Effect Transducer with their applications.</p>	<p>04.05.2023 TO 15.05.2023</p>	<p>7.1</p> <p>7.2</p> <p>7.3</p> <p>7.3.1</p> <p>7.3.2</p> <p>7.3.3</p> <p>7.4</p> <p>7.4.1</p> <p>7.4.2</p> <p>7.5</p> <p>7.5.1</p> <p>7.5.2</p> <p>7.5.3</p> <p>7.6</p>	<p>7.1. Define Transducer, sensing element or detector element and transduction elements.</p> <p>7.2. Classify transducer. Give examples of various class of transducer.</p> <p>7.3. Resistive transducer</p> <p>7.3.1 Linear and angular motion potentiometer.</p> <p>7.3.2 Thermistor and Resistance thermometers.</p> <p>7.3.3 Wire Resistance Strain Gauges</p> <p>7.4. Inductive Transducer</p> <p>7.4.1 Principle of linear variable differential Transformer (LVDT)</p> <p>7.4.2 Uses of LVDT.</p> <p>7.5. Capacitive Transducer.</p> <p>7.5.1 General principle of capacitive transducer.</p> <p>7.5.2 Variable area capacitive transducer.</p> <p>7.5.3 Change in distance between plate capacitive transducer.</p> <p>7.6. Piezo electric Transducer and Hall Effect Transducer with their applications.</p>	<p>04.05.2023</p> <p>05.05.2023</p> <p>08.05.2023</p> <p>09.05.2023</p> <p>10.05.2023</p> <p>11.05.2023</p> <p>12.05.2023</p> <p>15.05.2023</p>	
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8	OSCILLOSCOPE	05	8.1. Principle of operation of Cathode Ray Tube. 8.2. Principle of operation of Oscilloscope (with help of block diagram). 8.3. Measurement of DC Voltage & current. 8.4. Measurement of AC Voltage, current, phase & frequency.	16.05.2023 TO 18.05.2023	8.1 8.2 8.3 8.4	8.1. Principle of operation of Cathode Ray Tube. 8.2. Principle of operation of Oscilloscope (with help of block diagram). 8.3. Measurement of DC Voltage & current. 8.4. Measurement of AC Voltage, current, phase & frequency.	16.05.2023 17.05.2023 18.05.2023	
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