

Mymensingh Polytechnic Institute.
Semester Plan, Department: Electrical Technology
Six Semester, Subject Code: (26763)
Name of the Subject: Electrical & Electronic Measurement-2

No of week	Theory	Practical	Learning Materials	Remarks
1 st	<p><u>RANGE EXTENSION OF INSTRUMENT</u></p> <p>1.1 List different types of instrument for which extension is required.</p> <p>1.2 Explain the principles and necessity for extension of instrument range.</p> <p>1.3 Describe the ammeter shunt for DC circuit.</p> <p>1.4 Deduce the relation: $1 \frac{R}{R} NR R m sh$</p> <p>1.5 Explain ammeter shunt for AC circuit.</p> <p>1.6 Describe voltmeter multiplier for DC and swamping resistance.</p> <p>1.7 Explain voltmeter multiplier for AC instrument.</p> <p>1.8 Solve the problems related to ammeter shunt & voltmeter multiplier</p>	<p><u>EXTEND RANGE OF AN AMMETER BY USING SHUNT RESISTANCE</u></p> <p>1.1 Draw the circuit diagram to determine the shunt resistance of an ammeter.</p> <p>1.2 Select and collect the tools, equipment and materials required</p> <p>1.3 Prepare the circuit according to the circuit diagram using proper equipment.</p> <p>1.4 Check the equipment setting and connection before connecting Power supply.</p> <p>1.5 Record the readings from the meter.</p> <p>1.6 Calculate the value of shunt resistance.</p> <p>1.7 Maintain the record of performed task.</p>	White board, Marker Pen, Laptop, Multimedia Projector, Charts, Real Objects	
2 nd	<p><u>INSTRUMENT TRANSFORMER</u></p> <p>2.1 Define Current transformer (CT) and Potential transformer (PT).</p> <p>2.2 Explain the working principle of Current Transformer and Potential Transformer with circuit diagram.</p> <p>2.3 State the Necessity of CT & PT.</p> <p>2.4 Describe the burdens of instrument transformer.</p> <p>2.5 Compare between instrument transformer and Power transformer.</p> <p>2.6 Describe the construction of CT & PT.</p> <p>2.7 Explain the connection and vector diagram of CT & PT with sketch.</p> <p>2.8 Outline the effect of open circuited secondary of current transformer.</p> <p>2.9 Draw the circuit diagram showing CT, PT and Watt meter for 1-phase and 3-phase load. 2.10 Describe Inductive Voltage Transformer (IVT) and Capacitive Voltage Transformer (CVT) with diagram.</p>	<p><u>EXTENSION OF RANGE OF A VOLTMETER BY USING MULTIPLIER</u></p> <p>2.1 Draw the circuit diagram for determining the resistance of voltmeter multiplier.</p> <p>2.2 Select and collect tools, materials and Volt meter required.</p> <p>2.3 Connect the tools, equipment and materials required.</p> <p>2.4 Prepare the circuit according to the circuit diagram.</p> <p>2.5 Check the circuit before connecting Power supply.</p> <p>2.6 Record the reading from the meter.</p> <p>2.7 Calculate the value of resistance of the multiplier.</p> <p>2.8 Maintain the record of performed task.</p>	White board, Marker Pen, Laptop, Multimedia Projector, Charts, Real Objects	
3 rd	<p><u>MEASUREMENT OF LOW RESISTANCE</u></p> <p>3.1 Classify resistance.</p> <p>3.2 Explain low, medium and high range of resistance.</p> <p>3.3 List the measurement methods of low resistance.</p> <p>3.4 Describe the measurement of low resistance by ammeter- voltmeter method.</p> <p>3.5 Illustrate low resistance by Kelvin's double bridge method.</p> <p>3.6 Solve the problems on Kelvin's double bridge method.</p>	<p><u>UTILIZE INSTRUMENT TRANSFORMER</u></p> <p>3.1 Select the current transformer and potential transformer.</p> <p>3.2 Collect tools and Instrument Transformer.</p> <p>3.3 Draw the circuit diagram.</p> <p>3.4 Connect the equipment according to the circuit diagram.</p> <p>3.5 Check all connection before supplying Power to the circuit.</p> <p>3.6 Record reading from the meter and calculate the transformation ratio.</p> <p>3.7 Maintain the record of performed task.</p>	White board, Marker Pen, Laptop, Multimedia Projector, Charts, Real Objects	
4 th	<p><u>MEASUREMENT OF MEDIUM RESISTANCE</u></p> <p>4.1 List the measurement methods of medium resistance.</p> <p>4.2 Describe Wheatstone bridge method to measure the medium resistance.</p> <p>4.3 Mention the advantages of Wheatstone bridge method.</p> <p>4.4 Discuss the precaution in measuring medium resistance by Wheatstone bridge method.</p> <p>4.5 Solve the problems related to Wheatstone bridge</p>	<p><u>MEASURE LOW RESISTANCE BY AMMETER-VOLTMETER METHOD</u></p> <p>4.1 Draw the circuit diagram for the measurement of low resistance by ammeter-voltmeter method.</p> <p>4.2 Select tools, equipment and materials.</p> <p>4.3 Collect tools, equipment and materials.</p> <p>4.2 Connect the tools, equipment and materials required.</p> <p>4.3 Prepare the circuit according to the circuit diagram using proper equipment.</p> <p>4.4 Check the circuit before connecting Power supply.</p> <p>4.5 Record the meter readings.</p> <p>4.6 Calculate the resistance from the meter readings.</p> <p>4.7 Maintain the record of performed task.</p>	White board, Marker Pen, Laptop, Multimedia Projector, Charts, Real Objects	
5 th	<p><u>MEASUREMENT OF HIGH RESISTANCE</u></p> <p>5.1 Describe dielectric test of insulating materials.</p> <p>5.2 List the methods to measure high resistance</p>	<p><u>MEASURE MEDIUM RESISTANCE BY WHEATSTONE BRIDGE</u></p> <p>5.1 Draw the circuit diagram for measuring medium resistance by Wheatstone bridge.</p>	White board, Marker Pen, Laptop,	

	<p>measurement.</p> <p>5.4 Explain the construction and working principle of analog and digital Megger.</p> <p>5.5 Describe the method of measurement of high resistance by using analog and Digital Megger.</p> <p>5.6 State the uses of Megger.</p> <p>5.7 Describe measurement of earth resistance using digital and analog earth tester.</p>	<p>5.2 Select tools, equipment and materials required.</p> <p>5.3 Collect tools, equipment and materials.</p> <p>5.4 Prepare the circuit according to the circuit diagram.</p> <p>5.5 Check all the connection before connecting Power supply.</p> <p>5.6 Record the meter readings.</p> <p>5.7 Calculate the value of unknown resistance.</p> <p>5.8 Maintain the record of performed task.</p>	<p>Multimedia Projector, Charts, Real Objects</p>	
6 th	<p>ANALOG AND DIGITAL MULTIMETER</p> <p>6.1 Explain the circuit diagram of analog and digital Multimeter.</p> <p>6.2 Describe the construction of analog and digital Multimeter.</p> <p>6.3 Describe the uses of Digital Multimeter.</p> <p>6.4 Differentiate between Analog and Digital Multimeter.</p>	<p>MEASURE EARTH RESISTANCE BY ANALOG & DIGITAL EARTH TESTER</p> <p>6.1 Draw the circuit diagram for the measurement of earth resistance by analog & digital earth tester.</p> <p>6.2 Select earth testers and required tools, equipment and materials.</p> <p>6.3 Collect earth testers and required tools and materials.</p> <p>6.4 Connect the equipment according to the circuit diagram.</p> <p>6.5 Measure the earth resistance from the reading of the earth tester.</p> <p>6.6 Maintain the record of performed task.</p>	<p>White board, Marker Pen, Laptop, Multimedia Projector, Charts, Real Objects</p>	
7 th	<p>MEASUREMENT OF FREQUENCY BY ANALOG FREQUENCY METER</p> <p>7.1 List the methods of measuring frequency.</p> <p>7.2 Explain the principle of mechanical resonance and electrical resonance.</p> <p>7.3 Describe Construction the variation of impedance of an inductive circuit with the variation of supply frequency.</p> <p>7.4 Mention different types of frequency meter.</p> <p>7.5 Explain the construction and working principle of electrical resonance frequency meter.</p> <p>7.6 Describe the construction and working principle of Weston frequency meter.</p>	<p>MEASURE HIGH RESISTANCE BY ANALOG AND DIGITAL MEGGER</p> <p>7.1 Select a high resistance.</p> <p>7.2 Select an analog and digital Megger.</p> <p>7.3 Collect tools, materials, analog and digital Megger.</p> <p>7.4 Connect the resistance with the Megger.</p> <p>7.5 Measure the resistance from the reading of the Megger.</p> <p>7.6 Maintain the record of performed task.</p>	<p>White board, Marker Pen, Laptop, Multimedia Projector, Charts, Real Objects</p>	
8 th	<p>OPERATION OF DIGITAL FREQUENCY METER</p> <p>8.1 Describe the principle of operation of digital frequency meter.</p> <p>8.2 Sketch the block diagram of a digital frequency meter. Describe each block of a digital frequency meter.</p> <p>8.3 Describe the function of time base selector in digital frequency meter.</p> <p>8.6 Explain the operation of block diagram of a digital frequency meter with sketch .</p>	<p>MEASURE FREQUENCY BY ANALOG AND DIGITAL FREQUENCY METER</p> <p>8.1 Describe the principle of operation of digital frequency meter.</p> <p>8.2 Sketch the block diagram of a digital frequency meter. Describe each block of a digital frequency meter.</p> <p>8.3 Describe the function of time base selector in digital frequency meter.</p> <p>8.6 Explain the operation of block diagram of a digital frequency meter with sketch.</p>	<p>White board, Marker Pen, Laptop, Multimedia Projector, Charts, Real Objects</p>	
9 th	<p>CONSTRUCTION AND PRINCIPLE OF OPERATION OF ANALOG AND DIGITAL POWER FACTOR METER</p> <p>9.1 List different types of Power Factor Meter.</p> <p>9.2 Describe construction and principle of operation of single phase dynamometer type power factor meter.</p> <p>9.3 Narrate the construction and principle of operation of three phase dynamometer type power factor meter.</p> <p>9.4 Describe the principle of operation of digital power factor meter.</p> <p>9.5 Draw the block diagram of a digital power factor meter.</p> <p>9.6 Describe each block of block diagram of a digital power factor meter.</p>	<p>CONSTRUCTION AND PRINCIPLE OF OPERATION OF ANALOG AND DIGITAL POWER FACTOR METER</p> <p>9.1 List different types of Power Factor Meter.</p> <p>9.2 Describe construction and principle of operation of single phase dynamometer type power factor meter.</p> <p>9.3 Narrate the construction and principle of operation of three phase dynamometer type power factor meter.</p> <p>9.4 Describe the principle of operation of digital power factor meter.</p> <p>9.5 Draw the block diagram of a digital power factor meter.</p> <p>9.6 Describe each block of block diagram of a digital power factor meter.</p>	<p>White board, Marker Pen, Laptop, Multimedia Projector, Charts, Real Objects</p>	
10 th	<p>PRINCIPLE OF HIGH VOLTAGE MEASUREMENT AND TESTING</p> <p>10.1 Describe the high voltage measurement of electrical quantities.</p> <p>10.2 List the equipment for high voltage measurement.</p> <p>10.3 Describe the sphere gap method of high voltage measurement.</p> <p>10.4 Describe the potential divider method of high voltage measurement.</p> <p>10.5 Mention the advantages of sphere gap method of high voltage measurement.</p> <p>10.6 Mention the disadvantages of sphere gap method of high voltage measurement.</p>	<p>PRINCIPLE OF HIGH VOLTAGE MEASUREMENT AND TESTING</p> <p>10.1 Describe the high voltage measurement of electrical quantities.</p> <p>10.2 List the equipment for high voltage measurement.</p> <p>10.3 Describe the sphere gap method of high voltage measurement.</p> <p>10.4 Describe the potential divider method of high voltage measurement.</p> <p>10.5 Mention the advantages of sphere gap method of high voltage measurement.</p> <p>10.6 Mention the disadvantages of sphere gap method of high voltage measurement.</p>	<p>White board, Marker Pen, Laptop, Multimedia Projector, Charts, Real Objects</p>	

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