

## Electrical Science Lab

S. No	Specification	Qty
01.	<p><b><u>Experiment setup to To study Measurement of Power in 3 Phase by 2 Watt meter Method</u></b></p> <p>The Panel should have facility to perform experiments like study of Measurement of Power Factor in a Three Phase Circuit Measurement of Active, Reactive and Apparent Power in a Three Phase Circuit.Circuit diagram should be screen printed on the top of the Panel.</p> <p><b>BS 10 Type safety terminals &amp; patch cords should be provided</b></p> <p><b>For Proper safety.</b> Trainer should have :</p> <p>Mains Supply : Three Phase ,415V <math>\pm</math>10%, 50Hz Load: R-L ;Meters : Wattmeters: 500W (2 Nos.) Voltmeter (MI) : 500V ;Ammeter (MI) : 1A MCB : 10A Variac : 3 Phase variac 440V/10 A should be provided along with setup to control the input with terminals brought on the top of variac</p>	02
02.	<p><b><u>Experiment setup to verify Various parameters of a Single Phase Transformer with AC/Dc Bulb load</u></b></p> <p>Trainer should be able to perform experiments like determination of Polarity, Turns Ratio, Transformation Ratio, Iron Loss, Copper Loss, Efficiency ,O.C &amp; S.C Test etc.</p> <p>Circuit diagram should be screen printed on the top of the Panel.</p> <p><b>BS 10 Type safety terminals &amp; patch cords should be provided</b></p> <p><b>For Proper safety.</b> On boards Facility to connect external load Trainer should have :</p> <p>Inbuilt transformer : 1 KVA Primary Voltage : 0-125V, 0-125V ; Secondary Voltage : 0-125V, 0-125V Inbuilt Autotransformer : 270V/5A ; MCB : 5A Power on: Annunciator for power on.</p> <p><b>Meters Used (Panel type)</b> Voltmeter (MI) : 3 Nos.; Ammeter (MI) : 3 Nos. Wattmeter : 2 Nos.</p> <p><b>Load</b> : Resistive Lamp load 1.2 KW in steps of 100 watts to be provided with only switches on the top &amp; lamps to be provided inside the box. On boards MI ammeter 10 A &amp; indication light for power on.</p>	02
03.	<p><b><u>Single phase kWh Energy meter Trainer</u></b></p> <p>Inbuilt Voltmeter, Ammeter, Watt meter as Standard meter for calibration of Energy meter Big font LCD (16 x 2) for use as Standard meter/Energy meter calibration Separate Seven Segment Display as Energy meter Digital Calibration/ Operation using Keypad Sockets should be provided to Connect External Voltmeter, Ammeter and Watt meter for Calibration Default and User Calibration modes should be provided to avoid errors during Operation 5 LED Operation Indicators Auxiliary Power Supply : 90 - 270V <math>\pm</math>10%, 50Hz Standard meters Voltmeter Minimum/Maximum : 10/300V Ammeter Minimum /Maximum : 0.1/5A Watt meter Minimum/Maximum : 10/1500W Energy meter Display Resolution : 0.001kWh Frequency : 50Hz ; Fuse : 250mA (2 Nos.) ; 5A (4 Nos.) Trainer should be on Legend PCB with no components on the top of board. Housed in a Moulded case with moulded cover on top.</p>	02

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04.	<p><b>Trainer board to study and verify Norton's, Thevenin's, Maximum Power Transfer, Superposition, Reciprocity &amp; Tellegen's Theorems</b></p> <p>Training board should have            Constant current source            On board Voltmeter &amp; Ammeter            Straight forward representation of all theorems            On board equivalent circuits            Potentiometer to be provided to vary load resistance            DC power supply : +5V, Regulated &amp; + 12V, Regulated            Constant Current Source : 3.2 mA            Voltmeter Range : Multi range 200mV to 20V            Ammeter Range : Multi range 200<math>\mu</math>A to 200mA            Interconnections: 2mm gold plated            Patch cords : 2 mm banana stackable &amp; gold plated            Mains power supply : 90 - 270V <math>\pm</math>10%, 50Hz            Trainer should be housed in a protected case with cover attached to it to protect it from dust.</p>	10
05.	<p><b>Series &amp; parallel RLC resonance Trainer</b></p> <p>On Board Signal Gen. : Freq. Ranges : 1 KHz , 10 KHz, 60 KHz            Generator Output : 8Vpp            Onboard LCD based Voltmeter and Frequency Counter            Voltmeter : 2V            Interconnections: 2mm ;Patch cords : 2 mm banana stackable Mains Supply : 90 - 275 V/ 50 Hz            Multiple combination of components should be provided            Observation can be made either on oscilloscope or using LCD display for voltmeter &amp; Frequency counter provided on board.            Trainer should be on Legend PCB with no components on the top of board. Housed in a Moulded case with moulded cover on top to protect from dust.</p>	10