



(A Constituent Board of Quality Council of India)



#### SCOPE OF ACCREDITATION

Laboratory Name ZEAL MANUFACTURING AND CALIBRATION SERVICES PRIVATE LIMITED, UNIT

NO.D-104, SATYAM INDUSTRIAL ESTATE, OFF KARVE ROAD, ERANDWANE,

PUNE, MAHARASHTRA, INDIA

Accreditation Standard ISO/IEC 17025:2017

Certificate Number CC-2042 Page No.: 1 / 20

S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
		Pe	ermanent Facility		
1	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current @ 10Hz to 5 kHz	1 A to 10 A	0.17% to 0.26%	Using 6½ Digit Multimeter by Direct Method
2	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current @ 10Hz to 5 kHz	10 μA to 100 μA	1.25% to 0.16%	Using 6½ Digit Multimeter by Direct Method
3	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current @ 10Hz to 5 kHz	100 μA to 100 mA	0.16% to 0.17%	Using 6½ Digit Multimeter by Direct Method
4	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current @ 10Hz to 5 kHz	100 mA to 1 A	0.17%	Using 6½ Digit Multimeter by Direct Method
5	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current @10 kHz	1 A to 2.4 A	0.17% to 1.39%	Using 6½ Digit Multimeter by Direct Method
6	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current @10 kHz	100 μA to 100 mA	0.55% to 0.52%	Using 6½ Digit Multimeter by Direct Method





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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
7	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current @10 kHz	100 mA to 1 A	0.52% to 0.17%	Using 6½ Digit Multimeter by Direct Method
8	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC High Current @ 50 Hz	20 A to 6000 A	0.79% to 1.14%	Zeal make CT with 6 1/2 DMM and Shunt with DMM
9	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC High Voltage @50Hz	1 kV to 20 kV	4.11% to 6.1%	Using HV Probe with DMM (Kusam Meco) by Direct Method
10	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power & Energy (Apparent, Active & Reactive)(1 Ph, 3 Ph) @ 50Hz40V to 300V, 20mA to 120Aat 0.1PF to UPF lead/lag	0.08 W,VAR to 108 KW,KVAR	0.96% to 0.1%	Using 3Ph Reference Meter Zera with CT alongwith Power Source by Direct Method
11	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Resistance @1kHz	10 m Ohm to 100 k Ohm	0.59% to 0.06%	Using LCR Meter by Direct Mehtod
12	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage @ 50 Hz to 10 kHz	1 mV to 5 mV	4.62% to 0.98%	Using 6½ Digit Multimeter by Direct Method





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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
13	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage @ 50 Hz to 10 kHz	20 mV to 100 mV	0.30% to 0.12%	Using 6½ Digit Multimeter by Direct Method
14	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage @ 50 Hz to 10 kHz	5 mV to 20 mV	0.98% to 0.30%	Using 6½ Digit Multimeter by Direct Method
15	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage @ 50Hz to 10 kHz	100 mV to 1000 V	0.12% to 0.10%	Using 6½ Digit Multimeter by Direct Method
16	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	Capacitance @1kHz	1 pF to 100 pF	0.08% to 0.06%	Using LCR Meter by Direct Method
17	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	Capacitance @1kHz	100 pF to 1 mF	0.06% to 1.10%	Using LCR Meter by Direct Method
18	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	Inductance @1kHz	100 μH to 10 H	0.31% to 0.08%	Using LCR Meter by Direct Method





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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
19	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	Power Factor @50Hz(Lag & Lead), (1Ph, 3Ph)40 V to 300V10mA to 120A	0.1 PF to UPF lead/lag	0.007 PF	Using 3Ph Reference Meter Zera with CT alongwith Power Source by Direct Method
20	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current @ 50 Hz	>20 A to 1000 A	0.79%	Using Fluke 9100E Multifunction Calibrator by Direct Method
21	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current @ 50 Hz	3.2 A to 20 A	0.13% to 0.27%	Using Fluke 9100E Multifunction Calibrator by Direct Method
22	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current @ 50 Hz to 5 kHz	200 μA to 300 mA	0.76% to 0.10%	Using Fluke 9100E Multifunction Calibrator by Ditect Method
23	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current @ 50 Hz to 5 kHz	300 mA to 3.2 A	0.10% to 0.13%	Using Fluke 9100E Multifunction Calibrator by Ditect Method
24	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage @1kHz to 10 kHz	300 V to 1000 V	0.055% to 0.11%	Using Fluke 9100E Multifunction Calibrator by Ditect Method





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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
25	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage @1kHz to 10 kHz	60 mV to 300 mV	0.10% to 0.055%	Using Fluke 9100E Multifunction Calibrator by Ditect Method
26	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage @50Hz to 1 kHz	10 mV to 30 mV	4.38% to 0.41%	Using Fluke 9100 Multifunction Calibrator by Direct Method
27	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage @50Hz to 1 kHz	30 mV to 300 mV	0.41% to 0.053%	Using Fluke 9100 Multifunction Calibrator by Ditect Method
28	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage @50Hz to 1 kHz	300 mV to 1000 V	0.053% to 0.071%	Using Fluke 9100E Multifunction Calibrator by Ditect Method
29	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	1 A to 10 A	0.082% to 0.19%	Using 6½ Digit Multimeter by Direct Method
30	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	10 μA to 100 μA	0.35% to 0.09%	Using 6½ Digit Multimeter by Direct Method
31	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	100 μA to 100 mA	0.09% to 0.063%	Using 6½ Digit Multimeter by Direct Method
32	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	100 mA to 1 A	0.063% to 0.082%	Using 6½ Digit Multimeter by Direct Method





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33	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC High Current	20 A to 1000 A	0.63% to 0.70%	Using Source with 6½ DMM & 0.1 Shunt, AC/DC 2000A/75mV Shunt by Direct Method
34	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC High Voltage	1 kV to 20 kV	3.9% to 5.9%	Using HV Probe with DMM (Kusam Meco) by Direct Method
35	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	1 Ohm to 100 k Ohm	0.35% to 0.013%	Using 6½ Digit Multimeter by Direct Method
36	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	10 M Ohm to 100 M Ohm	0.05% to 0.92%	Using 6½ Digit Multimeter by Direct Method
37	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	100 K Ohm to 10 M Ohm	0.013% to 0.05%	Using 6½ Digit Multimeter by Direct Method
38	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	100 M Ohm to 1000 M Ohm	0.92% to 2.29%	Using 6½ Digit Multimeter by Direct Method
39	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance (4 Wire)Discrete	1 m ohm	0.09%	Using Multifunction Calibrator Fluke 9100 & 6½ digit DMM
40	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance (4 Wire)Discrete	1 ohm	0.03%	Using Multifunction Calibrator Fluke 9100 & 6½ digit DMM
41	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance (4 Wire)Discrete	10 μohm	1.99%	Using Multifunction Calibrator Fluke 9100 & 6½ digit DMM
42	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance (4 Wire)Discrete	10 m ohm	0.09%	Using Multifunction Calibrator Fluke 9100 & 6½ digit DMM





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43	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance (4 Wire)Discrete	100 μohm	0.21%	Using Multifunction Calibrator Fluke 9100 & 6½ digit DMM
44	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance (4 Wire)Discrete	100 m ohm	0.08%	Using Multifunction Calibrator Fluke 9100 & 6½ digit DMM
45	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance (4 Wire)Discrete	50 μohm	0.41%	Using Multifunction Calibrator Fluke 9100 & 6½ digit DMM
46	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	0.1 mV to 0.5 mV	3.99% to 0.80%	Using 6½ Digit Multimeter by Direct Method
47	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	0.5 mV to 1 mV	0.80% to 0.40%	Using 6½ Digit Multimeter by Direct Method
48	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	1 mV to 20 mV	0.40% to 0.024%	Using 6½ Digit Multimeter by Direct Method
49	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	100 mV to 100 V	0.008% to 0.005%	Using 6½ Digit Multimeter by Direct Method
50	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	100 V to 1000 V	0.005% to 0.006%	Using 6½ Digit Multimeter by Direct Method
51	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	20 mV to 100 mV	0.024% to 0.008%	Using 6½ Digit Multimeter by Direct Method
52	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	High Resistance (@Test Voltage upto 1000V)	5 Mohm to 100 Gohm	2.52% to 8.45%	Using Mega ohm Meter by Direct Method





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53	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Current	>20 A to 1000 A	0.74%	Using Fluke 9100 Multifunction Calibrator by Ditect Method
54	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Current	10 A to 20 A	0.07% to 0.09%	Using Fluke 9100 Multifunction Calibrator by Ditect Method
55	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Current	10 uA to 300 mA	0.15% to 0.02%	Using Fluke 9100 Multifunction Calibrator by Ditect Method
56	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Current	300 mA to 10 A	0.02% to 0.07%	Using Fluke 9100 Multifunction Calibrator by Ditect Method
57	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	1 M Ohm to 40 M Ohm	0.068% to 0.18%	Using Fluke 9100 Multifunction Calibrator by Direct Method
58	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	1 mOhm to 1 Ohm	5.66% to 0.12%	Using Precision Resistance Box, Make- Zeal
59	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	1 Ohm to 10 kOhm	1.16% to 0.032%	Using Fluke 9100 Multifunction Calibrator by Direct Method
60	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	10 kOhm to 1 M Ohm	0.032% to 0.068%	Using Fluke 9100 Multifunction Calibrator by Direct Method
61	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	40 M Ohm to 400 M Ohm	0.18% to 0.52%	Using Fluke 9100 Multifunction Calibrator by Direct Method
62	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Resistance (Discrete)	1 mohm	0.14%	Using Discrete Standard Resistors by Direct Method





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63	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Resistance (Discrete)	1 ohm	0.12%	Using Discrete Standard Resistors by Direct Method
64	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Resistance (Discrete)	10 μohm	2.26%	Using Discrete Standard Resistors by Direct Method
65	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Resistance (Discrete)	10 m ohm	0.14%	Using Discrete Standard Resistors by Direct Method
66	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Resistance (Discrete)	100 μohm	0.55 %	Using Discrete Standard Resistors by Direct Method
67	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Resistance (Discrete)	100 mohm	0.14%	Using Discrete Standard Resistors by Direct Method
68	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Resistance (Discrete)	50 μohm	1.32%	Using Discrete Standard Resistors by Direct Method
69	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	0.2 mV to 1 mV	3.68% to 0.74%	Using Fluke 9100 Multifunction Calibrator by Direct Method
70	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	1 mV to 30 mV	0.74% to 0.03%	Using Fluke 9100 Multifunction Calibrator by Direct Method
71	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	30 mV to 1000 V	0.03% to 0.01%	Using Fluke 9100 Multifunction Calibrator by Direct Method
72	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	OscilloscopeAmplitude (DC Voltage)	5 mV to 20 V/div	0.23% to 0.06%	Using Multifunction Calibrator and Sine Wave Generator by Direct Method





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73	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	OscilloscopeBandwidth (50 ohm)	500 kHz to 250 MHz	3%	Using Multifunction Calibrator and Sine Wave Generator by Direct Method
74	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	OscilloscopeTime	5 ns to 0.5 s	1.14% to 0.57%	Using Multifunction Calibrator and Sine Wave Generator by Direct Method
75	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	RTD Type	-200 °C to 800 °C	0.26 °C to 0.51 °C	Using Fluke 9100 Multifunction Calibrator by Direct Method
76	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	Thermocouple (J-Type)	- 200 °C to 1200 °C	0.64 °C	Using Fluke 9100 Multifunction Calibrator by Direct Method
77	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	Thermocouple (K-Type)	-200 °C to 1300 °C	0.65 °C	Using Fluke 9100 Multifunction Calibrator by Direct Method
78	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	Thermocouple (N-Type)	-50 °C to 1300 °C	0.63 °C	Using Fluke 9100 Multifunction Calibrator by Direct Method
79	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	Thermocouple (R-Type)	0 °C to 1700 °C	0.82 °C	Using Fluke 9100 Multifunction Calibrator by Direct Method
80	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	Thermocouple (S-Type)	0 °C to 1700 °C	0.79°C	Using Fluke 9100 Multifunction Calibrator by Direct Method





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81	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	Thermocouple (T-Type)	-200°C to 400 °C	0.65 °C	Using Fluke 9100 Multifunction Calibrator by Direct Method
82	ELECTRO- TECHNICAL- TIME & FREQUENCY (Measure)	Frequency	0.2 Hz to 1 Hz	0.28% to 0.06%	Using Frequency Counter by Direct Method
83	ELECTRO- TECHNICAL- TIME & FREQUENCY (Measure)	Frequency	1 Hz to 225 MHz	0.06% to 0.25%	Using Frequency Counter by Direct Method
84	ELECTRO- TECHNICAL- TIME & FREQUENCY (Measure)	Period	5 ns to 5 s	0.01%	Using Frequency Counter by Direct Method
85	ELECTRO- TECHNICAL- TIME & FREQUENCY (Measure)	Time	6 s to 24 hr	1.2s to 7.3s	Using Digital stop watch by Direct Method
86	ELECTRO- TECHNICAL- TIME & FREQUENCY (Source)	Frequency	10 Hz to 10 MHz	0.057% to 0.0064%	Using Fluke 9100E Multifunction Calibrator and Sine Wave Generator by Direct Method





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		Si	te Facility		
1	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current @ 10Hz to 5 kHz	1 A to 10 A	0.17% to 0.26%	Using 6½ Digit Multimeter by Direct Method
2	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current @ 10Hz to 5 kHz	10 μA to 100 μA	1.25% to 0.16%	Using 6½ Digit Multimeter by Direct Method
3	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current @ 10Hz to 5 kHz	100 μA to 100 mA	0.16% to 0.17%	Using 6½ Digit Multimeter by Direct Method
4	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current @ 10Hz to 5 kHz	100 mA to 1 A	0.17%	Using 6½ Digit Multimeter by Direct Method
5	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current @10 kHz	1 A to 2.4 A	0.17% to 1.39%	Using 6½ Digit Multimeter by Direct Method
6	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current @10 kHz	100 μA to 100 mA	0.55% to 0.52%	Using 6½ Digit Multimeter by Direct Method





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7	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current @10 kHz	100 mA to 1 A	0.52% to 0.17%	Using 6½ Digit Multimeter by Direct Method
8	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC High Current @ 50 Hz	20 A to 6000 A	0.79% to 1.14%	Zeal make CT with 6 1/2 DMM and Shunt with DMM
9	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC High Voltage @50Hz	1 kV to 100 kV	4.11% to 6.1%	Using HV Probe with DMM (Kusam Meco) by Direct Method
10	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power & Energy (Apparent, Active & Reactive)(1 Ph, 3 Ph) @ 50Hz40V to 300V, 20mA to 120Aat 0.1PF to UPF lead/lag	0.08 W,VAR to 108 KW,KVAR	0.96% to 0.1%	Using 3Ph Reference Meter Zera with CT alongwith Power Source by Direct Method
11	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Resistance @1kHz	10 m Ohm to 100 k Ohm	0.59% to 0.06%	Using LCR Meter by Direct Mehtod
12	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage @ 50 Hz to 10 kHz	1 mV to 5 mV	4.62% to 0.98%	Using 6½ Digit Multimeter by Direct Method





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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
13	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage @ 50 Hz to 10 kHz	20 mV to 100 mV	0.30% to 0.12%	Using 6½ Digit Multimeter by Direct Method
14	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage @ 50 Hz to 10 kHz	5 mV to 20 mV	0.98% to 0.30%	Using 6½ Digit Multimeter by Direct Method
15	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage @ 50Hz to 10 kHz	100 mV to 1000 V	0.12% to 0.10%	Using 6½ Digit Multimeter by Direct Method
16	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	Capacitance @1kHz	1 pF to 100 pF	0.08% to 0.06%	Using LCR Meter by Direct Method
17	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	Capacitance @1kHz	100 pF to 1 mF	0.06% to 1.10%	Using LCR Meter by Direct Method
18	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	Inductance @1kHz	100 μH to 10 H	0.31% to 0.08%	Using LCR Meter by Direct Method





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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
19	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	Power Factor @50Hz(Lag & Lead), (1Ph, 3Ph)40 V to 300V10mA to 120A	0.1 PF to UPF lead/lag	0.007 PF	Using 3Ph Reference Meter Zera with CT alongwith Power Source by Direct Method
20	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current @ 50 Hz to 1 kHz	0.1 mA to 20 mA	0.38% to 0.33%	Using 5½ Digit Multifunction Calibrator by Direct Method
21	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current @ 50 Hz to 1 kHz	10 A to 1000 A	0.79%	Using 5½ Digit Multifunction Calibrator with Current Coil by Direct Method
22	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current @ 50 Hz to 1 KHz	2 A to 10 A	0.32% to 0.33%	Using 5½ Digit Multifunction Calibrator by Direct Method
23	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current @ 50 Hz to 1 kHz	20 mA to 2 A	0.33% to 0.32%	Using 5½ Digit Multifunction Calibrator by Direct Method
24	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage @ 50 Hz to 1 kHz	20 V to 1000 V	0.35% to 0.22%	Using 5½ Digit Multifunction Calibrator by Direct Method





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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
25	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage @ 50 Hz to 1 kHz	200 mV to 20 V	0.44% to 0.35%	Using 5½ Digit Multifunction Calibrator by Direct Method
26	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage @50 Hz to 1 kHz	5 mV to 200 mV	1.22% to 0.44%	Using 5½ Digit Multifunction Calibrator by Direct Method
27	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	1 A to 10 A	0.082% to 0.19%	Using 6½ Digit Multimeter by Direct Method
28	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	10 μA to 100 μA	0.35% to 0.09%	Using 6½ Digit Multimeter by Direct Method
29	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	100 μA to 100 mA	0.09% to 0.063%	Using 6½ Digit  Multimeter by Direct  Method
30	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	100 mA to 1 A	0.063% to 0.082%	Using 6½ Digit  Multimeter by Direct  Method
31	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC High Current	20 A to 1000 A	0.63% to 0.70%	Using Source with 6½ DMM & 0.1 Shunt, AC/DC 2000A/75mV Shunt by Direct Method
32	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC High Voltage	1 kV to 50 kV	3.9% to 5.9%	Using HV Probe with DMM (Kusam Meco) by Direct Method
33	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	1 Ohm to 100 k Ohm	0.35% to 0.013%	Using 6½ Digit Multimeter by Direct Method





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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
34	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	10 M Ohm to 100 M Ohm	0.05% to 0.92%	Using 6½ Digit Multimeter by Direct Method
35	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	100 K Ohm to 10 M Ohm	0.013% to 0.05%	Using 6½ Digit Multimeter by Direct Method
36	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	100 M Ohm to 1000 M Ohm	0.92% to 2.29%	Using 6½ Digit Multimeter by Direct Method
37	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance (4 Wire)Discrete	1 m ohm	0.09%	Using Multifunction Calibrator Fluke 9100 & 6½ digit DMM
38	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance (4 Wire)Discrete	1 ohm	0.03%	Using Multifunction Calibrator Fluke 9100 & 6½ digit DMM
39	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance (4 Wire)Discrete	10 μohm	1.99%	Using Multifunction Calibrator Fluke 9100 & 6½ digit DMM
40	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance (4 Wire)Discrete	10 m ohm	0.09%	Using Multifunction Calibrator Fluke 9100 & 6½ digit DMM
41	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance (4 Wire)Discrete	100 μohm	0.21%	Using Multifunction Calibrator Fluke 9100 & 6½ digit DMM
42	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance (4 Wire)Discrete	100 m ohm	0.08%	Using Multifunction Calibrator Fluke 9100 & 6½ digit DMM
43	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance (4 Wire)Discrete	50 μohm	0.41%	Using Multifunction Calibrator Fluke 9100 & 6½ digit DMM





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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
44	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	0.1 mV to 0.5 mV	3.99% to 0.80%	Using 6½ Digit Multimeter by Direct Method
45	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	0.5 mV to 1 mV	0.80% to 0.40%	Using 6½ Digit Multimeter by Direct Method
46	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	1 mV to 20 mV	0.40% to 0.024%	Using 6½ Digit Multimeter by Direct Method
47	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	100 mV to 100 V	0.008% to 0.005%	Using 6½ Digit Multimeter by Direct Method
48	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	100 V to 1000 V	0.005% to 0.006%	Using 6½ Digit Multimeter by Direct Method
49	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	20 mV to 100 mV	0.024% to 0.008%	Using 6½ Digit Multimeter by Direct Method
50	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	High Resistance (@Test Voltage upto 1000V)	5 Mohm to 100 Gohm	2.52% to 8.45%	Using Mega ohm Meter by Direct Method
51	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Current	0.1 mA to 20 mA	0.2% to 0.17%	Using 5½ Digit  Multifunction Calibrator by Direct Method
52	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Current	10 A to 1000 A	0.74%	Using 5½ Digit Multifunction Calibrator by Direct Method
53	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Current	20 mA to 10 A	0.17% to 0.15%	Using 5½ Digit  Multifunction Calibrator by Direct Method





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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
54	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	1 mV to 200 mV	0.88% to 0.12%	Using 5½ Digit Multifunction Calibrator by Direct Method
55	ELECTRO- TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	200 V to 1000 V	0.12%	Using 5½ Digit Multifunction Calibrator by Direct Method
56	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	RTD Type	0 °C	0.6 °C	Using mV/mA/RTD Calibrator by Simulation Method
57	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	RTD Type	100 °C	0.76 °C	Using mV/mA/RTD Calibrator by Simulation Method
58	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	RTD Type	25 °C	0.75 °C	Using mV/mA/RTD Calibrator by Simulation Method
59	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	RTD Type	-25 °C	0.6 °C	Using mV/mA/RTD Calibrator by Simulation Method
60	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	RTD Type	300 °C	0.82 °C	Using mV/mA/RTD Calibrator by Simulation Method
61	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	RTD Type	400 °C	0.87 °C	Using mV/mA/RTD Calibrator by Simulation Method





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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
62	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	RTD Type	50 °C	0.75 °C	Using mV/mA/RTD Calibrator by Simulation Method
63	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	RTD Type	-50 °C	0.6 °C	Using mV/mA/RTD Calibrator by Simulation Method
64	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	RTD Type	75 °C	0.75 °C	Using mV/mA/RTD Calibrator by Simulation Method
65	ELECTRO- TECHNICAL- TIME & FREQUENCY (Measure)	Frequency	0.2 Hz to 1 Hz	0.28% to 0.06%	Using Frequency Counter by Direct Method
66	ELECTRO- TECHNICAL- TIME & FREQUENCY (Measure)	Frequency	1 Hz to 225 MHz	0.06% to 0.25%	Using Frequency Counter by Direct Method
67	ELECTRO- TECHNICAL- TIME & FREQUENCY (Measure)	Period	5 ns to 5 s	0.01%	Using Frequency Counter by Direct Method
68	ELECTRO- TECHNICAL- TIME & FREQUENCY (Measure)	Time	6 s to 24 hr	1.2s to 7.3s	Using Digital stop watch by Direct Method