



National Accreditation Board for Testing and Calibration Laboratories

(A Constituent Board of Quality Council of India)



SCOPE OF ACCREDITATION

Laboratory Name ELECTRONICS TEST AND DEVELOPMENT CENTRE, B108, INDUSTRIAL AREA, PHASE-8, MOHALI, PUNJAB, INDIA

Accreditation Standard ISO/IEC 17025:2017

Certificate Number CC-2109 Page No. : 1 / 33

Validity 07/06/2019 to 06/06/2021 Last Amended on -

S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
Permanent Facility					
1	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current (50 Hz to 5 kHz)	1 A to 20 A	0.8% to 0.9%	Using DMM 8508A Fluke, DMM 3458A Agilent, AC shunt, 7320 Guildline, Direct Method
2	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current (50 Hz to 5 kHz)	10µA to 100µA	0.7% to 0.7%	Using DMM 8508A Fluke, DMM 3458A Agilent by Direct Method
3	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current (50 Hz to 5 kHz)	100 mA to 1 A	0.8% to 0.8%	Using DMM 8508A Fluke, DMM 3458A Agilent by Direct Method
4	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current (50 Hz to 5 kHz)	100µA to 100 mA	0.8% to 0.8%	Using DMM 8508A Fluke, DMM 3458A Agilent by Direct Method
5	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current (50 Hz)	20 A to 30 A	2.0% to 2.0%	Using DMM 8508A Fluke, DMM 3458A Agilent, AC shunt, 7320 Guildline, 3 Ph. Power Analyser, 3000A, Clamp Meter U1213A Agilent by Direct Method



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6	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC High Voltage (50 Hz)	1 kV to 15 kV	2.3% to 2.3%	Using ESV Meter, ESH-28CTX by Direct Method
7	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Resistance (1 kHz)	10 mohm to 100 kohm	0.1% to 0.1%	Using RCL Meter, PM6304, Fluke , Precision LCR Meter, E4980AL, Keysight by Direct Method
8	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage (1 kHz to 1 MHz)	100 mV to 10 V	1.6% to 1.6%	Using DMM 8508A by Direct Method
9	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage (10 kHz to 100 kHz)	100 mV to 100 V	4.2% to 4.2%	Using DMM 8508A by Direct Method
10	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage (50 Hz to 1 kHz)	10 mV to 100 mV	0.04% to 0.06%	Using DMM 8508A by Direct Method
11	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage (50 Hz to 1 kHz)	100 mV to 100 V	0.06% to 0.06%	Using DMM 8508A by Direct Method



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12	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage (50 Hz to 1 kHz)	100 V to 1000 V	0.06% to 0.15%	using DMM 8508A by Direct Method
13	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Amplitude Modulation (10 MHz to 1 GHz) / CW: 10 MHz to 1 GHz / MF: 1 kHz	Depth: 10 % to 90 %	4.5%	Using Modulation, Analyser, Boonton (8201) by Direct Method
14	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Capacitance @ 1 kHz	1 pF to 1 uF	0.34% to 0.2%	Using Precision LCR Meter, E4980AL, Keysight by Direct Method
15	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Current & Voltage Harmonics Square Wave (60 V p-p, 1 A p-p, 50 Hz) Sine Wave (240 V, 1A), THD(Current & Voltage)	1st to 39th	0.6%	3 Phase Power Analyser (3000A) Voltech by Direct method
16	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Frequency Modulation (10 MHz to 1 GHz) / CW: 10 MHz to 1GHz / MF: 1 kHz	100 kHz to 500 kHz	6.5%	Using Modulation Analyser (8201), Boonton by Direct Method
17	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Inductance @1 kHz	100 µH to 10 H	0.2%	Using Precision LCR Meter, E4980AL, Keysight by Direct Method



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18	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	LF Power (Active), 50 Hz, 1 Phase, 10 V to 640 V, 0.1 A to 20 A @UPF	1 W to 12.8 kW	0.5%	Using 3 Phase Power Analyser, 3000A, Voltech, Direct method
19	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current (1 kHz – 5kHz)	300 mA to 10 A	1.0% to 1.0%	Using MPC 5520A Fluke by Direct method
20	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current (50 Hz – 1 kHz)	100µA to 300 mA	0.2 to 0.2	Using MPC 5520A Fluke by Direct method
21	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current (50 Hz – 1 kHz)	3 A to 20 A	0.1% to 0.85%	Using MPC 5520A Fluke by Direct method
22	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current (50 Hz – 1 kHz)	300 mA to 3 A	0.2% to 0.1%	Using MPC 5520A Fluke by Direct method
23	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current (50 Hz)	50 A to 1000 A	0.85% to 1.0%	Using MPC 5520A with Current Coil



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24	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Resistance (1 kHz)	10 ohm to 100 ohm	0.6% to 0.1%	Using Standard Decade Resister, 1433,GR by Direct Method
25	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Resistance (1kHz)	100 ohm to 100 kohm	0.1% to 0.06%	Using Standard Decade Resister (1433) GR by Direct Method
26	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Resistance (50 Hz & 1kHz)	10 mohm	0.1%	Using AC Shunt, Guidline(7320)
27	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Resistance (50 Hz – 1kHz)	1 ohm to 10 ohm	0.6%	Using Standard Decade Resister(1433)GR by Direct method
28	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage (10 kHz – 100 kHz)	10 mV to 3 V	0.09% to 0.05%	Using MPC 5520A, Fluke by Direct Method
29	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage (10 kHz – 100 kHz)	3 V to 300 V	0.05% to 0.28%	Using MPC 5520A, Fluke by Direct Method



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30	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage (100 kHz – 500 kHz)	100 mV to 3 V	0.1% to 0.19%	Using MPC 5520A, Fluke by Direct Method
31	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage (50 Hz – 10 kHz)	1 V to 1000 V	0.05% to 0.1%	Using MPC 5520A Fluke by Direct Method
32	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage (50 Hz – 10 kHz)	10 mV to 1 V	0.095% to 0.05%	Using MPC 5520A, Fluke by Direct Method
33	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current	1 A to 20 A	0.02% to 0.5%	Using DMM 8508A, Fluke ,DMM 34401A, Agilent with shunt, 3 Ph. Power Analyser, 3000A by Direct Method
34	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current	10 nA to 100 nA	0.5% to 0.12%	Using DMM 8508A Fluke by Direct Method
35	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current	10µA to 100µA	0.05% to 0.02%	Using DMM 8508A by Direct Method
36	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current	100 mA to 1 A	0.01% to 0.02%	Using DMM 8508A Fluke by Direct Method



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37	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	100 nA to 10 µA	0.12% to 0.05%	Using MM 8508A Fluke by Direct Method
38	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	100µA to 100 mA	0.02% to 0.01%	Using DMM 8508A, Fluke by Direct Method
39	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC High Voltage	1 kV to 20 kV	2.0% to 2.0%	Using ESV Meter, ESH-28CTX, SR by Direct Method
40	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	1 ohm to 100 ohm	0.01% to 0.004%	Using DMM 8508A, Fluke ,DMM 34401A, Agilent by Direct Method
41	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	10 mohm to 1 ohm	0.025% to 0.025%	Using DMM 8508A by Direct Method
42	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	100 Mohm to 20 Gohm	0.1% to 0.5%	Using DMM 8508A, Fluke , DMM 34401A, Agilent, UH Resistance Meter, R8340A by Direct Method
43	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	100 ohm to 10 Mohm	0.004% to 0.02%	Using DMM 8508A, Fluke ,DMM 34401A, Agilent by Direct Method
44	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	10ohm to 100 Mohm	0.02% to 0.1%	Using DMM 8508A, Fluke ,DMM 34401A, Agilent by Direct Method



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45	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	20 Gohm to 1 Tohm	1% to 3%	Using DMM 8508A, Fluke ,UH Resistance Meter, R8340A by Direct Method
46	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	1 mV to 10 mV	0.1% to 0.01%	Using DMM 8508A by Direct Method
47	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	1 V to 1000 V	0.002% to 0.002%	Using DMM 8508A, Fluke EVS Meter, ESH-28 CTX by Direct Method
48	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	-10 mV to 1 mV	0.01% to 0.01%	Using Digital Multimeter Agilent 8508 A, Digital Multimeter Agilent 34401 A by Direct Method
49	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	10 mV to 1 V	0.01% to 0.002%	Using DMM 8508A by Direct Method
50	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	1 A to 10 A	0.02% to 0.014%	Using MPC 5520A, Fluke by Direct Method
51	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	10 µA to 10 mA	0.02 to 0.01	Using MPC 5520A, Fluke by Direct Method
52	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	10 A to 50 A	0.62% to 0.62%	Using MPC 5520A, Fluke by Direct Method
53	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	10 mA to 1 A	0.01% to 0.02%	Using MPC 5520A, Fluke, UCS 9100, Wavetek 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 Current	50 A to 1000 A	0.62% to 0.8%	Using MPC 5520A, Fluke with current coil by Direct Method
55	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Power (1 V to 1000 V, 0.1 A to 20 A)	0.1 W to 20 kW	0.15% to 0.25%	Using MPC 5520A Fluke by Direct Method
56	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	10 mV to 100 mV	0.01% to 0.01%	Using MPC 5520A, Fluke by Direct Method
57	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	10 V to 1000 V	0.001% to 0.02%	Using MPC 5520A, Fluke by Direct Method
58	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	-100 mV to 10 mV	0.01% to 0.01%	Using MPC 5520A, Fluke by Direct Method
59	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	100 mV to 10 V	0.01% to 0.001%	Using MPC 5520A, Fluke by Direct Method
60	ELECTRO-TECHNICAL- OTHERS (Measure)	Power Factor (Lag / Lead)	0.2 PF to 1 PF	0.002PF	Using 3 Phase Power Analyser, 30000A, Voltech, Direct method
61	ELECTRO-TECHNICAL- OTHERS (Measure)	RF Level (10 MHz to 2.5 GHz) at 100V Insertion Unit	-1 dBm to 13 dBm	0.9dB to 0.5dB	Using Modulation Analyser, 8201, Boonton, Level Meter, URV 35, R&S by Direct Method
62	ELECTRO-TECHNICAL- OTHERS (Measure)	RF Level (10 MHz to 2.5 GHz) at 100V Insertion Unit	-40 dBm to 13 dBm	0.9dB to 0.56dB	Using Modulation Analyser, 8201, Boonton, Level Meter, URV 35, R&S by Direct Method



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63	ELECTRO-TECHNICAL- OTHERS (Source)	Amplitude Modulation (10 MHz to 1GHz) / CW: 10 MHz to 1GHz / MF: 1 kHz	10 % to 90 %	4.52% to 4.52%	Using Signal Generator , SML02, R&S by Direct Method
64	ELECTRO-TECHNICAL- OTHERS (Source)	Bandwidth	50 kHz to 1 GHz	5.6% to 5.6%	Using MPC 5520A, Fluke, UCS 9100, Wavetek by Direct Method
65	ELECTRO-TECHNICAL- OTHERS (Source)	Capacitance (1 kHz)	1 pF to 1000 pF	0.1% to 0.1%	Using Capacitance Standard, 1403K,G,D,A. 1409F, L,Y,T, 1423-A by Direct Method
66	ELECTRO-TECHNICAL- OTHERS (Source)	Capacitance (1 kHz)	1000 pF to 10 µF	0.1% to 0.1%	Using Capacitance Standard, 1403K, G,D,A. 1409F, L,T,Y 1423-A by Direct Method
67	ELECTRO-TECHNICAL- OTHERS (Source)	DC Resistance	1 Gohm to 1 Tohm	0.1% to 1.5%	Using Welwyn, 5249 H. Tinsley, HARS-X-6-0.001, ZX 84, SRL100G, SRL1T, IET by Direct Method
68	ELECTRO-TECHNICAL- OTHERS (Source)	DC Resistance	1 mohm to 1 ohm	0.14% to 0.14%	Using Resistance Std. 4737, H. Tinsley 9410, Vaiseshika 8400, 5249 H. Tinsley, HARS-X-6-0.001 by Direct Method



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69	ELECTRO-TECHNICAL- OTHERS (Source)	DC Resistance	1 ohm to 100 Mohm	0.12% to 0.05%	Using Resistance Std. 4737, H. Tinsley 9410, Vaiseshika 8400, SO1 Alma, 497500, Welwyn, 5249 H. Tinsley, HARS-X-6-0.001, ZX 84 by Direct Method
70	ELECTRO-TECHNICAL- OTHERS (Source)	DC Resistance	100 Mohm to 1 Gohm	0.05% to 0.1%	Using Vaiseshika 8400, Welwyn, 5249 H. Tinsley, ZX 84 by Direct Method
71	ELECTRO-TECHNICAL- OTHERS (Source)	Frequency Modulation (10 MHz to 1GHz) / CW: 10 MHz to 1GHz / MF: 1 kHz	10 kHz to 100 kHz	6.5% to 6.5%	Using Signal Generator, SML02, R&S by Direct Method
72	ELECTRO-TECHNICAL- OTHERS (Source)	Inductance (1 kHz)	100 µH to 10 H	0.15% to 0.3%	Using Inductance Standard , 1482-B,E,H,L,P,T, 1491G by Direct Method
73	ELECTRO-TECHNICAL- OTHERS (Source)	LF Power (Active), 50 Hz, 1 Phase, 10 V to 640 V, 0.1 A to 20 A, @UPF	1 W to 12.8 kW	0.5% to 0.5%	Using MPC 5520A by Direct Method
74	ELECTRO-TECHNICAL- OTHERS (Source)	Oscilloscope Calibration Amplitude 1 KHz	2 mV to 100 V	0.2% to 1%	Using MPC 5520A, Fluke by Direct Method
75	ELECTRO-TECHNICAL- OTHERS (Source)	Power Factor (lag / lead)	0 to 1 (Lag/Lead)	0.002PF	Using Ref Std, MPC, 5520A, Fluke by Direct Method
76	ELECTRO-TECHNICAL- OTHERS (Source)	RF Level (1 MHz to 2GHz)	-30 dBm to 13 dBm	0.9dB to 0.54dB	Using Signal Generator , SML02, R&S by Direct Method



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77	ELECTRO-TECHNICAL- OTHERS (Source)	RF Level (10 MHz to 2 GHz)	0.1 kW to 1 kW	0.15% to 0.25%	Using 3 Phase Power Energy, Reference Standard Zera, MPC 5520A Fluke by Direct Method
78	ELECTRO-TECHNICAL- OTHERS (Source)	Time Base (Marker)	2 ns to 20 ms	0.13% to 0.13%	Using MPC 5520A, Fluke, UCS 9100, Wavetek by Direct Method
79	ELECTRO-TECHNICAL- OTHERS (Source)	Time Base (Marker)	20 ms to 5 s	0.13% to 0.5%	Using MPC 5520A, Fluke, UCS 9100, Wavetek by Direct Method
80	ELECTRO-TECHNICAL- TEMPERATURE SIMULATION (Measure)	RTD	-200°C to 800°C	0.39 °C	Using Process Calibrator fluke 744 by Direct Method
81	ELECTRO-TECHNICAL- TEMPERATURE SIMULATION (Measure)	Thermocouple B, C, E, J, K, L, N, R, S, T, & U (-200 °C to 1750 °C)	-100 mV to 100 mV	0.37°C	DMM 8508A, Fluke ,DMM 34401A, Agilent , 744, Fluke by DirectMethod
82	ELECTRO-TECHNICAL- TEMPERATURE SIMULATION (Source)	RTD	-200 °C to 850 °C	0.29°C	Using MPC 5520A, Fluke, UCS 9100, Wavetek by Simulation Method
83	ELECTRO-TECHNICAL- TEMPERATURE SIMULATION (Source)	Thermocouple (T/C Type) B, C, E, J, K, L, N, R, S, T, U ,(-)200 °C to 1750 °C	-10 mV to 10 mV	0.37°C	Using MPC 5520A, Fluke, UCS 9100, Wavetek Process Calibrator, 744, Fluke by Simulation Method,



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84	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	Thermocouple (T/C Type) B, C, E, J, K, L, N, R, S, T, U, (-)200 °C to 1750 °C	-100 mV to -10 mV	0.37°C	Using MPC 5520A, Fluke, UCS 9100, Wavetek Process Calibrator, 744, Fluke by Simulation Method,
85	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	Thermocouple (T/C Type) B, C, E, J, K, L, N, R, S, T, U, (-)200 deg. C to 1750 deg. C	10 mV to 100 mV	0.3°C	Using MPC 5520A, Fluke, UCS 9100, Wavetek Process Calibrator, 744, Fluke by Simulation Method,
86	ELECTRO- TECHNICAL- TIME & FREQUENCY (Measure)	Frequency	1 MHz to 2 GHz	2.5ppm to 1ppm	Using Counter, PM6680B, Fluke by Direct method
87	ELECTRO- TECHNICAL- TIME & FREQUENCY (Measure)	Frequency	10 Hz to 1 MHz	250ppm to 2.5ppm	Using Counter, PM6680B, Fluke by Direct method
88	ELECTRO- TECHNICAL- TIME & FREQUENCY (Measure)	Time Interval	5 s to 3600 s	0.1s	Using Counter, PM6680B, Fluke by Direct method/Comparison Method
89	ELECTRO- TECHNICAL- TIME & FREQUENCY (Source)	Frequency	1 MHz to 2 GHz	2.5ppm to 1ppm	Using Signal Generator, SML02, R&S by Direct Method
90	ELECTRO- TECHNICAL- TIME & FREQUENCY (Source)	Frequency	10 Hz to 1 MHz	200ppm to 2.5ppm	Using MPC 5520A, Fluke, Signal Generator, SML02, R&S by Direct Method



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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
91	MECHANICAL-ACCELERATION AND SPEED	Tachometer (Contact Type)	200 RPM to 10000 RPM	1% of rdg. to 0.46% of rdg.	Using Master Tachometer RPM Source by Comparison Method
92	MECHANICAL-ACCELERATION AND SPEED	Tachometer (Non Contact Type)	200 RPM to 10000 RPM	0.43% of rdg to 0.31% of rdg.	Using Master Tachometer RPM Source by Comparison Method
93	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Dial Gauge plunger Type (Analog /Digital)Least Count : 0.01 mm	upto 25mm	5µm	Using Dial Calibration Tester by Comparison Method
94	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	External Micrometer (Analog/Digital) Least Count : 0.001 mm	upto 25 mm	2µm	Using Gauge Blocks Comparison Method
95	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Feeler Gauges	Upto 1mm	3µm	Using Digital Micrometer by Comparison Method
96	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Height Gauge (Vernier/Digital)Least Count : 0.02 mm	Upto 300mm	22µm	Using Gauge Blocks / Length Bars by Comparison Method
97	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Test SievesAperture Size	0.03mm to 3.5mm	5.1µm	Using Profile Projector by Comparison Method



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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
98	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Vernier Caliper (Analog / Digital)Least Count : 0.01 mm	upto 600 mm	22µm	Using Gauge Blocks / Length Bars by Comparison Method
99	MECHANICAL-PRESSURE INDICATING DEVICES	Hydraulic Pressure - Dial Pressure Gauges, Digital Pressure Gauges	30 bar to 700 bar	0.05% of rdg.	Using Dead Weight Tester by Comparison Method
100	MECHANICAL-PRESSURE INDICATING DEVICES	Hydraulic Pressure - Dial Pressure Gauges, Digital Pressure Gauges	3 bar to 35 bar	0.054% of rdg.	Using Dead Weight Tester by Comparison Method
101	MECHANICAL-PRESSURE INDICATING DEVICES	Pneumatic Pressure-Dial Pressure Gauges, Digital Pressure Gauges	0 bar to 20 bar	0.027bar	Using Digital Pressure Gauge with Reference to Calibrated DPG by Comparison Method
102	MECHANICAL-PRESSURE INDICATING DEVICES	Vacuum Negative Pressure-Dial Pressure Gauges, Digital Pressure Gauges	(-) 0.9 bar to 0 bar	0.005bar	Using Digital Pressure Gauge with Reference to Calibrated DPG by Comparison Method
103	MECHANICAL-WEIGHING SCALE AND BALANCE	Calibration of Balances Readability : 0.01 mg and coarser	upto 200 g	0.01mg	Using E2 Class Weights by comparison method As per OIML R -76-1
104	MECHANICAL-WEIGHING SCALE AND BALANCE	Calibration of Balances Readability : 0.1 g	Upto 12 kg	0.1g	Using E2 Class Weights By comparison Method As per OIML R -76-1



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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
105	MECHANICAL-WEIGHING SCALE AND BALANCE	Calibration of Balances Readability:1g	up to 50 kg	1g	Using E2 Class Weights by comparison method As per OIML R -76-1
106	MECHANICAL-WEIGHTS	Weights of F1 class and coarser	1 g to 5 g	0.016mg	Using Calibration of Weights by ABBA Method as per OIML R 111-1 Using E2 Class Standard Weights and Mass Comparator(Readability :0.01 mg)
107	MECHANICAL-WEIGHTS	Weights of F1 class and coarser	1 mg to 5 mg	0.01mg	Using Calibration of Weights by ABBA Method as per OIML R 111-1 Using E2 Class Standard Weights and Mass Comparator(Readability :0.01 mg)
108	MECHANICAL-WEIGHTS	Weights of F1 class and coarser	10 g to 50 g	0.03mg	Using Calibration of Weights by ABBA Method as per OIML R 111-1 Using E2 Class Standard Weights and Mass Comparator(Readability :0.01 mg)
109	MECHANICAL-WEIGHTS	weights of F2 class and coarser	100 g to 200 g	0.13mg	Using Calibration of Weights by ABBA Method as per OIML R 111-1 Using E2 Class Standard Weights and Mass Comparator(Readability :0.01 mg)



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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
110	MECHANICAL-WEIGHTS	Weights of F2 class for 10 mg to 50 mg; F1 class for 100 mg to 500 mg and coarser	10 mg to 500 mg	0.013mg	Using Calibration of Weights by ABBA Method as per OIML R 111-1 Using E2 Class Standard Weights and Mass Comparator(Readability :0.01 mg)
111	MECHANICAL-WEIGHTS	Weights of M1 class and coarser	5 kg to 10 kg	0.103g	Using Calibration of Weights by ABBA Method as per OIML R 111-1 Using E2 Class Standard Weights and Mass Comparator(Readability :0.1 g)
112	MECHANICAL-WEIGHTS	Weights of M2 class and coarser	500 g to 2 kg	0.087g	Using Calibration of Weights by ABBA Method as per OIML R 111-1 Using E2 Class Standard Weights and Mass Comparator(Readability :0.1 g)
113	MECHANICAL-WEIGHTS	Weights of M3 and coarser	20 kg	1.9g	Using Calibration of Weights by ABBA Method as per OIML R 111-1 Using E2 Class Standard Weights and Mass Comparator(Readability :1 g)



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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
114	MECHANICAL-WEIGHTS	Weights of M3 class and coarser	50 kg	6.6g	Using Calibration of Weights by ABBA Method as per OIML R 111-1 Using E2 Class Standard Weights and Mass Comparator(Readability :1 g)
115	THERMAL-TEMPERATURE	PRT/Temperature Transmitter/Sensor with or without Temperature Indicator/Controller	-70 °C to -45 °C	0.63°C	Using Precision Thermometer , PRT and Climatic Test Chamber by Comparison Method
116	THERMAL-TEMPERATURE	PRT/Temperature Transmitter/Sensor with or without Temperature Indicator/Controller, Glass Thermometer	-45 °C to 200 °C	0.4 °C	Using precision Thermometer ,PRT and Refrigerated and Heating Circulator by Comparison Method
117	THERMAL-TEMPERATURE	PRT/Temperature Transmitter/Thermocouple Sensor with or without Temperature Indicator/Controller	200 °C to 600 °C	0.7°C	Using Precision Thermometer ,PRT and Dry Block Calibrator By Comparison Method
118	THERMAL-TEMPERATURE	Thermocouple With and Without Temperature Indicator / Controller	600 °C to 1000 °C	2.1°C	Using Precision Thermometer ,Thermocouple and Dry Block Calibrator by Comparison Method



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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
Site Facility					
1	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current (50 Hz to 5 kHz)	1 A to 20 A	0.8% to 0.9%	Using DMM 8508A Fluke, DMM 3458A Agilent, AC shunt, 7320 Guildline, Direct Method
2	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current (50 Hz to 5 kHz)	10µA to 100µA	0.7% to 0.7%	Using DMM 8508A Fluke, DMM 3458A Agilent by Direct Method
3	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current (50 Hz to 5 kHz)	100 mA to 1 A	0.8% to 0.8%	Using DMM 8508A Fluke, DMM 3458A Agilent by Direct Method
4	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current (50 Hz to 5 kHz)	100µA to 100 mA	0.8% to 0.8%	Using DMM 8508A Fluke, DMM 3458A Agilent by Direct Method
5	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current (50 Hz)	20 A to 30 A	2.0% to 2.0%	Using DMM 8508A Fluke, DMM 3458A Agilent, AC shunt, 7320 Guildline, 3 Ph. Power Analyser, 3000A, Clamp Meter U1213A Agilent by Direct Method



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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
6	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC High Voltage (50 Hz)	1 kV to 15 kV	2.3% to 2.3%	Using ESV Meter, ESH-28CTX by Direct Method
7	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Resistance (1 kHz)	10 mohm to 100 kohm	0.1% to 0.1%	Using RCL Meter, PM6304, Fluke , Precision LCR Meter, E4980AL, Keysight by Direct Method
8	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage (1 kHz to 1 MHz)	100 mV to 10 V	1.6% to 1.6%	Using DMM 8508A by Direct Method
9	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage (10 kHz to 100 kHz)	100 mV to 100 V	4.2% to 4.2%	Using DMM 8508A by Direct Method
10	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage (50 Hz to 1 kHz)	10 mV to 100 mV	0.04% to 0.06%	Using DMM 8508A by Direct Method
11	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage (50 Hz to 1 kHz)	100 mV to 100 V	0.06% to 0.06%	Using DMM 8508A by Direct Method



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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
12	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage (50 Hz to 1 kHz)	100 V to 1000 V	0.06% to 0.15%	using DMM 8508A by Direct Method
13	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Amplitude Modulation (10 MHz to 1 GHz) / CW: 10 MHz to 1 GHz / MF: 1 kHz	Depth: 10 % to 90 %	4.5%	Using Modulation, Analyser, Boonton (8201) by Direct Method
14	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Capacitance @ 1 kHz	1 pF to 1 uF	0.34% to 0.2%	Using Precision LCR Meter, E4980AL, Keysight by Direct Method
15	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Current & Voltage Harmonics Square Wave (60 V p-p, 1 A p-p, 50 Hz) Sine Wave (240 V, 1A), THD(Current & Voltage)	1st to 39th	0.6%	3 Phase Power Analyser (3000A) Voltech by Direct method
16	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Frequency Modulation (10 MHz to 1 GHz) / CW: 10 MHz to 1GHz / MF: 1 kHz	100 kHz to 500 kHz	6.5%	Using Modulation Analyser (8201), Boonton by Direct Method
17	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Inductance @1 kHz	100 µH to 10 H	0.2%	Using Precision LCR Meter, E4980AL, Keysight by Direct Method



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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
18	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Measure)	LF Power (Active), 50 Hz, 1 Phase, 10 V to 640 V, 0.1 A to 20 A @UPF	1 W to 12.8 kW	0.5%	Using 3 Phase Power Analyser, 3000A, Voltech, Direct method
19	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current (1 kHz – 5kHz)	300 mA to 10 A	1.0% to 1.0%	Using MPC 5520A Fluke by Direct method
20	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current (50 Hz – 1 kHz)	100µA to 300 mA	0.2 to 0.2	Using MPC 5520A Fluke by Direct method
21	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current (50 Hz – 1 kHz)	3 A to 20 A	0.1% to 0.85%	Using MPC 5520A Fluke by Direct method
22	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current (50 Hz – 1 kHz)	300 mA to 3 A	0.2% to 0.1%	Using MPC 5520A Fluke by Direct method
23	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current (50 Hz)	50 A to 1000 A	0.85% to 1.0%	Using MPC 5520A with Current Coil



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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
24	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Resistance (1 kHz)	10 ohm to 100 ohm	0.6% to 0.1%	Using Standard Decade Resister, 1433,GR by Direct Method
25	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Resistance (1kHz)	100 ohm to 100 kohm	0.1% to 0.06%	Using Standard Decade Resister (1433) GR by Direct Method
26	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Resistance (50 Hz & 1kHz)	10 mohm	0.1%	Using AC Shunt, Guildline(7320)
27	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Resistance (50 Hz – 1kHz)	1 ohm to 10 ohm	0.6%	Using Standard Decade Resister(1433)GR by Direct method
28	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage (10 kHz – 100 kHz)	10 mV to 3 V	0.09% to 0.05%	Using MPC 5520A, Fluke by Direct Method
29	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage (10 kHz – 100 kHz)	3 V to 300 V	0.05% to 0.28%	Using MPC 5520A, Fluke by Direct Method



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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
30	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage (100 kHz – 500 kHz)	100 mV to 3 V	0.1% to 0.19%	Using MPC 5520A, Fluke by Direct Method
31	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage (50 Hz – 10 kHz)	1 V to 1000 V	0.05% to 0.1%	Using MPC 5520A Fluke by Direct Method
32	ELECTRO- TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage (50 Hz – 10 kHz)	10 mV to 1 V	0.095% to 0.05%	Using MPC 5520A, Fluke by Direct Method
33	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	1 A to 20 A	0.02% to 0.5%	Using DMM 8508A, Fluke ,DMM 34401A, Agilent with shunt, 3 Ph. Power Analyser, 3000A by Direct Method
34	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	10 nA to 100 nA	0.5% to 0.12%	Using DMM 8508A Fluke by Direct Method
35	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	10µA to 100µA	0.05% to 0.02%	Using DMM 8508A by Direct Method
36	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	100 mA to 1 A	0.01% to 0.02%	Using DMM 8508A Fluke by Direct Method



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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
37	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current	100 nA to 10 µA	0.12% to 0.05%	Using MM 8508A Fluke by Direct Method
38	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current	100µA to 100 mA	0.02% to 0.01%	Using DMM 8508A, Fluke by Direct Method
39	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC High Voltage	1 kV to 20 kV	2.0% to 2.0%	Using ESV Meter, ESH-28CTX, SR by Direct Method
40	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	1 ohm to 100 ohm	0.01% to 0.004%	Using DMM 8508A, Fluke ,DMM 34401A, Agilent by Direct Method
41	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	10 mohm to 1 ohm	0.025% to 0.025%	Using DMM 8508A by Direct Method
42	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	100 Mohm to 20 Gohm	0.1% to 0.5%	Using DMM 8508A, Fluke , DMM 34401A, Agilent, UH Resistance Meter, R8340A by Direct Method
43	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	100 ohm to 10 Mohm	0.004% to 0.02%	Using DMM 8508A, Fluke ,DMM 34401A, Agilent by Direct Method
44	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	10ohm to 100 Mohm	0.02% to 0.1%	Using DMM 8508A, Fluke ,DMM 34401A, Agilent by Direct Method



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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
45	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	20 Gohm to 1 Tohm	1% to 3%	Using DMM 8508A, Fluke ,UH Resistance Meter, R8340A by Direct Method
46	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	1 mV to 10 mV	0.1% to 0.01%	Using DMM 8508A by Direct Method
47	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	1 V to 1000 V	0.002% to 0.002%	Using DMM 8508A, Fluke EVS Meter, ESH-28 CTX by Direct Method
48	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	-10 mV to 1 mV	0.01% to 0.01%	Using Digital Multimeter Agilent 8508 A, Digital Multimeter Agilent 34401 A by Direct Method
49	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	10 mV to 1 V	0.01% to 0.002%	Using DMM 8508A by Direct Method
50	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	1 A to 10 A	0.02% to 0.014%	Using MPC 5520A, Fluke by Direct Method
51	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	10 µA to 10 mA	0.02 to 0.01	Using MPC 5520A, Fluke by Direct Method
52	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	10 A to 50 A	0.62% to 0.62%	Using MPC 5520A, Fluke by Direct Method
53	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	10 mA to 1 A	0.01% to 0.02%	Using MPC 5520A, Fluke, UCS 9100, Wavetek 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 Current	50 A to 1000 A	0.62% to 0.8%	Using MPC 5520A, Fluke with current coil by Direct Method
55	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Power (1 V to 1000 V, 0.1 A to 20 A)	0.1 W to 20 kW	0.15% to 0.25%	Using MPC 5520A Fluke by Direct Method
56	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	10 mV to 100 mV	0.01% to 0.01%	Using MPC 5520A, Fluke by Direct Method
57	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	10 V to 1000 V	0.001% to 0.02%	Using MPC 5520A, Fluke by Direct Method
58	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	-100 mV to 10 mV	0.01% to 0.01%	Using MPC 5520A, Fluke by Direct Method
59	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	100 mV to 10 V	0.01% to 0.001%	Using MPC 5520A, Fluke by Direct Method
60	ELECTRO-TECHNICAL- OTHERS (Measure)	Power Factor (Lag / Lead)	0.2 PF to 1 PF	0.002PF	Using 3 Phase Power Analyser, 30000A, Voltech, Direct method
61	ELECTRO-TECHNICAL- OTHERS (Measure)	RF Level (10 MHz to 2.5 GHz) at 100V Insertion Unit	-1 dBm to 13 dBm	0.9dB to 0.5dB	Using Modulation Analyser, 8201, Boonton, Level Meter, URV 35, R&S by Direct Method
62	ELECTRO-TECHNICAL- OTHERS (Source)	Amplitude Modulation (10 MHz to 1GHz) / CW: 10 MHz to 1GHz / MF: 1 kHz	10 % to 90 %	4.52% to 4.52%	Using Signal Generator , SML02, R&S by Direct Method



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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
63	ELECTRO-TECHNICAL- OTHERS (Source)	Bandwidth	50 kHz to 1 GHz	5.6% to 5.6%	Using MPC 5520A, Fluke, UCS 9100, Wavetek by Direct Method
64	ELECTRO-TECHNICAL- OTHERS (Source)	Capacitance (1 kHz)	1 pF to 1000 pF	0.1% to 0.1%	Using Capacitance Standard, 1403K,G,D,A. 1409F, L,Y,T, 1423-A by Direct Method
65	ELECTRO-TECHNICAL- OTHERS (Source)	Capacitance (1 kHz)	1000 pF to 10 µF	0.1% to 0.1%	Using Capacitance Standard, 1403K, G,D,A. 1409F, L,T,Y 1423-A by Direct Method
66	ELECTRO-TECHNICAL- OTHERS (Source)	DC Resistance	1 Gohm to 1 Tohm	0.1% to 1.5%	Using Welwyn, 5249 H. Tinsley, HARS-X-6-0.001, ZX 84, SRL100G, SRL1T, IET by Direct Method
67	ELECTRO-TECHNICAL- OTHERS (Source)	DC Resistance	1 mohm to 1 ohm	0.14% to 0.14%	Using Resistance Std. 4737, H. Tinsley 9410, Vaiseshika 8400, 5249 H. Tinsley, HARS-X-6-0.001 by Direct Method
68	ELECTRO-TECHNICAL- OTHERS (Source)	DC Resistance	1 ohm to 100 Mohm	0.12% to 0.05%	Using Resistance Std. 4737, H. Tinsley 9410, Vaiseshika 8400, SO1 Alma, 497500, Welwyn, 5249 H. Tinsley, HARS-X-6-0.001, ZX 84 by Direct Method



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69	ELECTRO-TECHNICAL- OTHERS (Source)	DC Resistance	100 Mohm to 1 Gohm	0.05% to 0.1%	Using Vaiseshika 8400, Welwyn, 5249 H. Tinsley, ZX 84 by Direct Method
70	ELECTRO-TECHNICAL- OTHERS (Source)	Frequency Modulation (10 MHz to 1GHz) / CW: 10 MHz to 1GHz / MF: 1 kHz	10 kHz to 100 kHz	6.5% to 6.5%	Using Signal Generator, SML02, R&S by Direct Method
71	ELECTRO-TECHNICAL- OTHERS (Source)	Inductance (1 kHz)	100 µH to 10 H	0.15% to 0.3%	Using Inductance Standard , 1482-B,E,H,L,P,T, 1491G by Direct Method
72	ELECTRO-TECHNICAL- OTHERS (Source)	LF Power (Active), 50 Hz, 1 Phase, 10 V to 640 V, 0.1 A to 20 A, @UPF	1 W to 12.8 kW	0.5% to 0.5%	Using MPC 5520A by Direct Method
73	ELECTRO-TECHNICAL- OTHERS (Source)	Oscilloscope Calibration Amplitude 1 KHz	2 mV to 100 V	0.2% to 1%	Using MPC 5520A, Fluke by Direct Method
74	ELECTRO-TECHNICAL- OTHERS (Source)	Power Factor (lag / lead)	0 to 1 (Lag/Lead)	0.002PF	Using Ref Std, MPC, 5520A, Fluke by Direct Method
75	ELECTRO-TECHNICAL- OTHERS (Source)	RF Level (1 MHz to 2GHz)	-30 dBm to 13 dBm	0.9dB to 0.54dB	Using Signal Generator , SML02, R&S by Direct Method
76	ELECTRO-TECHNICAL- OTHERS (Source)	RF Level (10 MHz to 2 GHz)	0.1 kW to 1 kW	0.15% to 0.25%	Using 3 Phase Power Energy, Reference Standard Zera, MPC 5520A Fluke by Direct Method



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77	ELECTRO-TECHNICAL- OTHERS (Source)	Time Base (Marker)	2 ns to 20 ms	0.13% to 0.13%	Using MPC 5520A, Fluke, UCS 9100, Wavetek by Direct Method
78	ELECTRO-TECHNICAL- OTHERS (Source)	Time Base (Marker)	20 ms to 5 s	0.13% to 0.5%	Using MPC 5520A, Fluke, UCS 9100, Wavetek by Direct Method
79	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	RTD	-200°C to 800°C	0.39 °C	Using Process Calibrator fluke 744 by Direct Method
80	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Thermocouple B, C, E, J, K, L, N, R, S, T, & U (-200 °C to 1750 °C)	-100 mV to 100 mV	0.37°C	DMM 8508A, Fluke ,DMM 34401A, Agilent , 744, Fluke by DirectMethod
81	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	RTD	-200 °C to 850 °C	0.29°C	Using MPC 5520A, Fluke, UCS 9100, Wavetek by Simulation Method
82	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Thermocouple (T/C Type) B, C, E, J, K, L, N, R, S, T, U ,(-)200 °C to 1750 °C	-10 mV to 10 mV	0.37°C	Using MPC 5520A, Fluke, UCS 9100, Wavetek Process Calibrator, 744, Fluke by Simulation Method,
83	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Thermocouple (T/C Type) B, C, E, J, K, L, N, R, S, T, U ,(-)200 °C to 1750 °C	-100 mV to -10 mV	0.37°C	Using MPC 5520A, Fluke, UCS 9100, Wavetek Process Calibrator, 744, Fluke by Simulation Method,



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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
84	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Thermocouple (T/C Type) B, C, E, J, K, L, N, R, S, T, U, (-)200 deg. C to 1750 deg. C	10 mV to 100 mV	0.3°C	Using MPC 5520A, Fluke, UCS 9100, Wavetek Process Calibrator, 744, Fluke by Simulation Method,
85	ELECTRO-TECHNICAL- TIME & FREQUENCY (Measure)	Frequency	1 MHz to 2 GHz	2.5ppm to 1ppm	Using Counter, PM6680B, Fluke by Direct method
86	ELECTRO-TECHNICAL- TIME & FREQUENCY (Measure)	Frequency	10 Hz to 1 MHz	250ppm to 2.5ppm	Using Counter, PM6680B, Fluke by Direct method
87	ELECTRO-TECHNICAL- TIME & FREQUENCY (Measure)	Time Interval	5 s to 3600 s	0.1s	Using Counter, PM6680B, Fluke by Direct method/Comparison Method
88	ELECTRO-TECHNICAL- TIME & FREQUENCY (Source)	Frequency	1 MHz to 2 GHz	2.5ppm to 1ppm	Using Signal Generator, SML02, R&S by Direct Method
89	ELECTRO-TECHNICAL- TIME & FREQUENCY (Source)	Frequency	10 Hz to 1 MHz	200ppm to 2.5ppm	Using MPC 5520A, Fluke, Signal Generator, SML02, R&S by Direct Method
90	MECHANICAL-ACCELERATION AND SPEED	Tachometer (Non Contact Type)	200 RPM to 10000 RPM	0.43% of rdg to 0.31% of rdg.	Using Master Tachometer RPM Source by Comparison Method



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S.No	Discipline / Group	Quantity Measured/ Instrument	Range / Frequency	* Calibration Measurement Capability(±)	Remarks
91	MECHANICAL-PRESSURE INDICATING DEVICES	Hydraulic Pressure-Dial Pressure Gauges, Digital Pressure Gauges	0 bar to 700 bar	0.30bar	Using Digital Pressure Gauge with Reference to Calibrated DPG by Comparison Method
92	MECHANICAL-PRESSURE INDICATING DEVICES	Pneumatic Pressure-Dial Pressure Gauges, Digital Pressure Gauges	0 bar to 20 bar	0.027bar	Using Digital Pressure Gauge with Reference to Calibrated DPG by Comparison Method
93	MECHANICAL-PRESSURE INDICATING DEVICES	Vacuum Negative Pressure-Dial Pressure Gauges, Digital Pressure Gauges	(-) 0.9 bar to 0 bar	0.005bar	Using Digital Pressure Gauge with Reference to Calibrated DPG by Comparison Method
94	MECHANICAL-WEIGHING SCALE AND BALANCE	Calibration of Balances Readability : 0.01 mg and coarser	upto 200 g	0.01mg	Using E2 Class Weights by comparison method As per OIML R -76-1
95	MECHANICAL-WEIGHING SCALE AND BALANCE	Calibration of Balances Readability : 0.1 g	Upto 12 kg	0.1g	Using E2 Class Weights By comparison Method As per OIML R -76-1
96	MECHANICAL-WEIGHING SCALE AND BALANCE	Calibration of Balances Readability:1g	up to 50 kg	1g	Using E2 Class Weights by comparison method As per OIML R -76-1
97	THERMAL-TEMPERATURE	Calibration of Environmental Chamber , Refrigerator, Deep Freezer, Oven/ Incubator (industrial Purpose Only) , Dry Block Calibrator and Liquid Bath	-70 °C to 180 °C	1.2°C	Using RTD with Data Logger/Multi Function Calibrator , Multipoint Measurement upto 16 points by Comparison Method



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98	THERMAL- TEMPERATURE	PRT, Thermocouple ,Temperature Transmitter, Sensor with or without Temperature Indicator/Controller	600 °C to 1000 °C	2.1°C	Using Multi Function Calibrator , S Type, Thermocouple and Dry Block Calibrator by Comparison Method
99	THERMAL- TEMPERATURE	PRT/RTD, Thermocouple ,Temperature Transmitter, with or without Temperature Indicator/Controller	150 °C to 600 °C	0.7°C	Using Multi Function Calibrator , SSPRT and Dry Block Calibrator by Comparison Method
100	THERMAL- TEMPERATURE	PRT/Temperature Transmitter/Sensor with or without Temperature Indicator/Controller	-30 °C to 140 °C	0.6°C	Using Multi Function Calibrator and SSPRT, RTD with Multifunction Calibrator and Data logger by Comparison Method