



# **SCOPE OF ACCREDITATION**

Laboratory Name :

Accreditation Standard Certificate Number Validity NASHIK ENGINEERING CLUSTER, "SAHASTRARASHMI", C-10, MIDC, AMBAD, NASHIK, MAHARASHTRA, INDIA

ISO/IEC 17025:2017 CC-2248 07/11/2019 to 06/11/2021\*

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S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
		1 2	Permanent Facility	Uni	
1	ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Measure)	AC Current @ 50 Hz	Using COM 3003 ZERA By Direct/Comparison Method	0.001 A to 120 A	0.031 % to 0.025 %
2	ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Measure)	AC Current @ 50 Hz to 1 kHz	Using 8½ DMM Fluke 8508A By Direct/Comparison Method	10 μA to 100 μA	0.1%
3	ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Measure)	AC Current @ 50 Hz to 1 kHz	Using 8½ DMM Fluke 8508A By Direct/Comparison Method	10 mA to 20 A	0.036 % to 0.113 %
4	ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Measure)	AC Current @ 50 Hz to 1 kHz	Using 8½ DMM Fluke 8508A By Direct/Comparison Method	100 µA to 10 mA	0.1 % to 0.036 %





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5	ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Source)	AC CURRENT @ 1 kHz	Using Fluke 9100A MFC By Direct Method	200 µA to 200 mA	0.102%
6	ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Source)	AC CURRENT @ 1 kHz	Using Fluke 9100A MFC By Direct Method	200 mA to 2 A	0.124%
7	ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Source)	AC CURRENT @ 50 Hz	Using Fluke 9100A MFC By Direct Method	2 A to 20 A	0.193 % to 0.296 %
8	ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Source)	AC CURRENT @ 50 Hz	Using Universal Calibrator Fluke 9100A with 50 turn current coil by direct Method	50 A to 1000 A	0.321 % to 0.730 %
9	ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Source)	AC CURRENT @ 50 Hz to 1 kHz	Using Fluke 5720A MFC By Direct Method	10 μA to 200 μA	0.018 % to 0.019 %





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10	ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Source)	AC CURRENT @ 50 Hz to 1 kHz	Using Fluke 5720A MFC By Direct Method	100 mA to 2 A	0.018 % to 0.037 %
11	ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Source)	AC CURRENT @ 50 Hz to 1 kHz	Using Fluke 5720A MFC By Direct Method	200 µA to 100 mA	0.019 % to 0.018 %
12	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	Using 8½ DMM Fluke 8508A By Direct/Comparison Method	10 μA to 100 μA	0.007 % to 0.006 %
13	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	Using 8½ DMM Fluke 8508A By Direct/Comparison Method	100 µA to 100 mA	0.0025 % to 0.006 %
14	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	Using 8½ DMM Fluke 8508A By Direct/Comparison Method	100 mA to 20 A	0.006 % to 0.048 %





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15	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	AC High Voltage @ 50Hz	Using HV Divider with kV Meter By Direct/Comparison Method	1 kV to 100 kV	1.48 % to 2.28 %
16	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	AC Power & Active Energy Cos : 0.2 to 1 Single Phase & three phase at 50 Hz 30V to 320V 1mA to 120A	Using ZERA MTS 310 Meter Test System with COM 3003 By Direct/Comparison Method	0.2 W to 38.4 kW	0.04% to 0.02% /PF
17	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	AC Power & Active Energy Cos : 0.2 to 1 Single Phase & three phase at 50Hz 30V to 320V 1mA to 120A	Using zera MTS 310 Meter Test System with COM 3003 By Direct/Comparison Method	0.6 W to 115.2 kW	0.04% to 0.02%/PF
18	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	AC Power & Reactive Energy Sin : 0.2 to 1 Single Phase & three phase @ 50Hz , 30V to 320V 1mA to 120A	Using zera MTS 310 Meter Test System with COM 3003 By Direct/Comparison Method	0.2 Var to 38.4KVar & 0.6 Var to 115.2 kVar	0.04%to 0.02%/PF
19	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	AC Voltage @ 20Hz	Using Fluke 5790A AC Measurement Standard By Direct/Comparison Method	1 mV to 200 mV	0.065 % to 0.019 %





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20	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	AC Voltage @ 20Hz	Using Fluke 5790A AC Measurement Standard By Direct/Comparison Method	200 mV to 200 V	0.019 % to 0.015 %
21	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	AC Voltage @ 40Hz to 1 kHz	Using Fluke 5790A AC Measurement Standard By Direct/Comparison Method	200 V to 1000 V	0.013 % to 0.02 %
22	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	AC Voltage @ 40Hz to 20 kHz	Using Fluke 5790A AC Measurement Standard By Direct/Comparison Method	1 mV to 20 mV	0.016 % to 0.016 %
23	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (measure)	AC Voltage @ 40Hz to 20 kHz	Using Fluke 5790A AC Measurement Standard By Direct/Comparison Method	20 mV to 20 V	0.065 % to 0.039 %
24	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	AC Voltage @ 40Hz to 20 kHz	Using Fluke 5790A AC Measurement Standard By Direct/Comparison Method	20 V to 200 V	0.039 % to 0.013 %





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25	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	AC Voltage @ 50 kHz to 100 kHz	Using Fluke 5790A AC Measurement Standard By Direct/Comparison Method	1 mV to 20 mV	0.1%
26	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	AC Voltage @ 50 kHz to 100 kHz	Using Fluke 5790A AC Measurement Standard By Direct/Comparison Method	20 mV to 200 V	0.1 % to 0.077 %
27	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	Capacitance @ 1kHz	Using Std. LCR Meter (PM 6304) By Direct/ Comparison Method	100 pF to 1 mF	0.9882 % to 1.7 %
28	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	Current Transformer @ 50 Hz, 5A to 3200A / 1A-5A	Using Std. CT & AITTS98 ELTEL Set up By Comparison Method	120 % to 1 %	R.E. 0.031 % to R.E. 0.039 %
29	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	Current Transformer @ 50Hz, 5A to 3200A/ 1A-5A	Using Std. CT & AITTS-98 ELTEL Set up By Comparison Method	120 % to 1 %	PAE 1.33 Min to PAE 3.15 Min





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30	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	Current Transformer Burden (1A & 5A) @ 1PF to 0.8 PF	Using Zera Meter Test System MTS 310 with COM 3003 By Direct /Comparison	1 VA to 70 VA	0.86 % to 0.46 %
31	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC High Voltage	Using HV Divider with kV Meter By Direct/Comparison Method	1 kV to 40 kV	2.2%
32	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC Resistance	using 8½ DMM Fluke 8508A By Direct/Comparison Method	1 GOhm to 10 GOhm	0.05 % to 0.24 %
33	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC Resistance	Using 8½ DMM Fluke 8508A By Direct/Comparison Method	1 Ohm to 10 Ohm	0.0022 % to 0.0012 %
34	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC Resistance	Using 8½ DMM Fluke 8508A By Direct/Comparison Method	10 Ohm to 10 MOhm	0.0012 % to 0.003 %





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35	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC Resistance	Using 8½ DMM Fluke 8508A By Direct/Comparison Method	10 m ohm to 1 Ohm	0.0042%
36	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC Resistance	Using 8½ DMM Fluke 8508A By Direct/Comparison Method	10 MOhm to 100 MOhm	0.003 % to 0.009 %
37	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC Resistance	Using 8½ DMM Fluke 8508A By Direct /Comparison Method	100 MOhm to 1 GOhm	0.009 % to 0.05 %
38	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC Voltage	Using 8½ DMM Fluke 8508A By Direct/Comparison Method	1 mV to 100 mV	0.012 % to 0.0007 %
39	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC Voltage	Using 8½ DMM Fluke 8508A By Direct/Comparison Method	1 V to 10 V	0.0005%





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40	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC Voltage	Using 8½ DMM Fluke 8508A By Direct/Comparison Method	10 V to 1000 V	0.0005 % to 0.0009 %
41	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC Voltage	Using 8½ DMM Fluke 8508A By Direct Comparison Method	100 μV to 1 mV	0.0014 % to 0.012 %
42	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC Voltage	Using 8½ DMM Fluke 8508A By Direct/Comparison Method	100 mV to 1 V	0.0007 % to 0.0005 %
43	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	Harmonics Order @ 30V to 240V and 1mA to 120A	Using Universal Meter Test system ZERA COM3003 by Direct/comparison method	1st Order to 50th Order	0.6%
44	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	Inductance @1kHz	Using Standard LCR Meter FLUKE make by Direct/Comparison method	100 μH to 10 H	0.3 % to 0.185 %





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45	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	PHASE ANGLE ERROR OF INSTRUMENT TRANSFORMER TEST SETUP @ 50 Hz (CT MODE)	Using Std. CT EPD with Std Capacitor & AITTS-98 ELTEL set up By Comparison Method	(1A,5A ) at(1% to 200%) of rated current	P.A.E 1.00 min
46	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	PHASE ANGLE ERROR OF INSTRUMENT TRANSFORMER TEST SETUP @ 50 Hz (PT MODE)	Using STD CT. EPD. with STD Capacitor & AITTS-98 ELTEL Set up By Comparison Method	(1A,5A ) at(1% to 200%) of rated current	P.A.E. 1.00 min
47	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	PHASE ANGLE ERROR OF INSTRUMENT TRANSFORMER TEST SETUP @ 50 Hz (PT MODE)	Using Std. CT. EPD with STD Capacitor & AITTS-98 ELTEL set up By Comparison Method	110V,63.5V ( 2% to 150% of Rated Voltage )	P.A.E. 0.8Min
48	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	Potential Transformer @ 50Hz	Using EPD & AITTS-98 ELTEL set up By Direct/Comparison Method	11-22-33/root 3 kV // 63.5Vat (2%to. 150%) of Rated Voltage	R.E 0.09% & PAE -3.9 min
49	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	Potential Transformer @ 50Hz	Using EPD & AITTs-98 ELTEL Set Up By Direct/Comparison Method	3.3-6.6kV /Root3 // 63.5Vat(2% to 150%) of rated current	P.A.E. 3.9 min & RE 0.09%





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50	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	Power Factor (Phase Angle)	Using zera MTS 310 Meter Test System with COM 3003 By Direct/Comparison Method	0.2 Lead / Lag to 1 UPF	0.0031PF
51	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	RATIO ERROR OF INSTRUMENT TRANSFORMER TEST SETUP @ 50 Hz (CT MODE)	Using Std. CT. EPD with Std. Capacitor & AITTS-98 ELTEL set up By Comparison Method	(1A,5A ) at(1% to 200%) of rated current	R.E 0.030%
52	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	RATIO ERROR OF INSTRUMENT TRANSFORMER TEST SETUP @ 50 Hz (PT MODE)	Using Std. CT EPD with STD Capacitor & AITTS-98 ELTEL set up By Comparison Method	110V,63.5V ( 2% to 150% of Rated Voltage )	R.E. 0.02%
53	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	Voltage Transformer Burden (110V & 63.5V) @ 0.8PF	Using Zera Meter Test System MTS 310 with COM 3003 By Direct Comparison Method	2.5 VA to 130 VA	0.43%
54	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	AC POWER (1 Phase) @ 50Hz UPF to 0.2 Lag & Lead 50V-600V, 1A to 10A	Using Fluke 5500A MPC By Direct/ Comparison Method	50 W to 6 kW	0.34%to 1.6%/ PF





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55	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	AC VOLTAGE @ 20 Hz	Using Fluke 5720A MFC By Direct Method	2 mV to 20 mV	0.235 % to 0.03 %
56	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	AC Voltage @ 20 Hz	Using Fluke 5720A MFC By Direct /Comparison Method.	20 mV to 200 mV	0.033 % to 0.016 %
57	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	AC VOLTAGE @ 20 Hz	Using Fluke 5720A MFC By Direct/ Comparison Method	20 mV to 200 V	0.03 % to 0.013 %
58	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	AC VOLTAGE @ 40 Hz to 20 kHz	Using Fluke 5720A MFC By Direct/ Comparison Method	200 mV to 200 V	0.016 % to 0.008 %
59	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	AC Voltage @ 40Hz to 1kHz	Using Fluke 5720A MFC By Direct/Comparison Method	2 mV to 20 mV	0.247 % to 0.033 %





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60	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	AC Voltage @ 40Hz to 20kHz	Using Fluke 5720A MFC By Direct/Comparison Method	2 mV to 20 mV	0.247 % to 0.033 %
61	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	AC VOLTAGE @ 50 Hz to 1 kHz	Using Fluke 5720A MFC By Direct/ Comparison Method	200 V to 1000 V	0.009 % to 0.012 %
62	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	AC VOLTAGE @ 50 KHz to 100 kHz	Using Fluke 5720A MFC By Direct/ Comparison Method	2 mV to 20 V	0.264 % to 0.015 %
63	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	AC Voltage @100KHz	Using Multifunction calibrator FLUKE 5720A by direct and comparison method	200 mV to 200 V	0.01%
64	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	CAPACITANCE @1 kHz	Using Fluke 5500A MPC By Direct Method	10 nF to 1 mF	2.896 % to 1.939 %





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65	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC CURRENT	Using Fluke 5720A MFC By Direct/ Comparison Method	10 μA to 200 μA	0.0078%
66	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC CURRENT	Using Fluke 9100A MFC By Direct/ Comparison Method	2 A to 20 A	0.01 % to 0.102 %
67	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC CURRENT	Using Fluke 5720A MFC By Direct/ Comparison Method	20 mA to 2 A	0.0044% to 0.01 %
68	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC CURRENT	Using Fluke 5720A MFC By Direct/ Comparison Method	200 µA to 20 mA	0.0078 % to 0.0044 %
69	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC CURRENT	With CC by direct Method	50 A to 1000 A	0.303 % to 0.7 %





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70	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC RESISTANCE	Using Fluke 5720A MFC ( Discrete values) By Direct Method	1 kOhm	0.0011%
71	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC RESISTANCE	Using Fluke 5720A MFC ( Discrete values) By Direct Method	1 MOhm	0.002%
72	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC RESISTANCE	Using Fluke 5500A MPC By Direct Method	1 mOhm to 330 MOhm	0.685 % to 0.012 %
73	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC RESISTANCE	Using Fluke 5720A MFC ( Discrete values) By Direct Method	1 ohm	0.011%
74	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC RESISTANCE	Using Fluke 5720A MFC ( Discrete values) By Direct Method	10 kOhm	0.0011%





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75	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC RESISTANCE	Using Fluke 5720A MFC ( Discrete values) By Direct Method	10 MOhm	0.004%
76	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC RESISTANCE	Using Fluke 5720A MFC ( Discrete values) By Direct Method	10 ohm	0.0029%
77	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC RESISTANCE	Using Fluke 5720A MFC ( Discrete values) By Direct Method	100 kOhm	0.0014%
78	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC RESISTANCE	Using Fluke 5720A MFC ( Discrete values) By Direct Method	100 MOhm	0.014%
79	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC RESISTANCE	Using Fluke 5720A MFC ( Discrete values) By Direct Method	100 ohm	0.0013%





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80	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC RESISTANCE	Using Fluke 5720A MFC ( Discrete values) By Direct Method	2 kOhm	0.0011%
81	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC RESISTANCE	Using Fluke 5720A MFC ( Discrete values) By Direct Method	2 MOhm	0.002%
82	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC RESISTANCE	Using Fluke 5720A MFC ( Discrete values) By Direct Method	2 ohm	0.011%
83	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC RESISTANCE	Using Fluke 5720A MFC ( Discrete values) By Direct Method	20 kOhm	0.0007%
84	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC RESISTANCE	Using Fluke 5720A MFC ( Discrete values) By Direct Method	20 MOhm	0.006%





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85	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC RESISTANCE	Using Fluke 5720A MFC ( Discrete values) By Direct Method	20 ohm	0.0029%
86	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC RESISTANCE	Using Fluke 5720A MFC ( Discrete values) By Direct Method	200 kOhm	0.0014%
87	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC RESISTANCE	Using Fluke 5720A MFC ( Discrete values) By Direct Method	200 ohm	0.0025%
88	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC VOLTAGE	Using Fluke 5720A MFC By Direct/ Comparison Method	1 mV to 10 mV	0.0011%
89	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC VOLTAGE	Using Fluke 5720A MFC By Direct/ Comparison Method	10 V to 1000 V	0.0005 % to 0.0008 %





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S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
90	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC VOLTAGE	Using Fluke 5720A MFC By Direct/ Comparison Method	100 mV to 10 V	0.0011 % to 0.0005 %
91	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	High Resistance	Using Decade Resistance Box By Direct Method	1 T ohm to 10 T ohm	8.06%
92	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	High Resistance	Using Decade Resistance Box By Direct Method	10 G ohm to 300 G ohm	0.75 % to 8.05 %
93	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	HIGH RESISTANCE	Using Electrical Safety Tester Fluke 5320A By Direct Method	10 k Ohm to 9 G ohm	0.236 % to 1.66 %
94	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	Inductance	Using Decade Inductance Box by Direct method	100 μH to 10 H	0.359 % to 0.222 %





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S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
95	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	Oscilloscope (Amplitude)	Using FLUKE make MPC 5500A by Direct method	20 mV to 20 V	0.65%
96	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	Oscilloscope (Bandwidth)	Using FLUKE make MPC5500A by Direct Method	50 Hz to 300 MHz	6.4%
97	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	Oscilloscope (Time Marker)	Using FLUKE make MPC5500A by Direct Method	5 nS to 100 micro sec.	0.2%
98	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Measure)	RTD (PT-100)	Using Fluke 5500A MPC, Universal Calibrator Fluke 9100A & using Standard ITS-90 scale By direct Comparison Method	-200 ºC to 850 ºC	0.27ºC





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99	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Measure)	Thermocouple (B) Type	Using Fluke Multiproduct Calibrator & Fluke Universal Calibrator Using Standard ITS-90 scale By Direct/Comparison Method	100 ºC to 1750 ºC	0.6ºC
100	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Measure)	Thermocouple (R) Type	Using Fluke Multiproduct Calibrator & Fluke Universal Calibrator Using Standard ITS-90 scale By Direct/Comparison Method	100 ºC to 1750 ºC	0.6ºC
101	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Measure)	Thermocouple (E) Type	Using Fluke Multiproduct Calibrator & Fluke Universal Calibrator Using Standard ITS-90 scale By Direct/Comparison Method	-100 ºC to 700 ºC	0.32ºC





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S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
102	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Measure)	Thermocouple (J) Type	Using Fluke Multiproduct Calibrator & Fluke Universal Calibrator Using Standard ITS-90 scale By Direct/Comparison Method	-200 ºC to 1100 ºC	0.32ºC
103	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Measure)	Thermocouple (K) Type	Using Fluke Multiproduct Calibrator & Fluke Universal Calibrator Using Standard ITS-90 scale By Direct/Comparison Method	-200 ºC to 1300 ºC	0.32ºC
104	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Measure)	Thermocouple (T) Type	Using Fluke Multiproduct Calibrator & Fluke Universal Calibrator Using Standard ITS-90 scale By Direct/Comparison Method	-200 ºC to 350 ºC	0.32ºC





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S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
105	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	TEMPERATURE SIMULATION (Indicator/ Recorder/ Controller) RTD PT-100	Using Fluke 5500A MPC & using Standard Chart O to °C and mV to °C Chart By Direct/ Comparison Method	-200 °C to 850 °C	0.27°C
106	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	TEMPERATURE SIMULATION (Indicator/ Recorder/ Controller) THERMOCOUPLE B Type	Using Fluke 5500A MPC & using Standard Chart O to °C and mV to °C Chart By Direct/ Comparison Method	600 °C to 1750 °C	0.6°C
107	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	TEMPERATURE SIMULATION (Indicator/ Recorder/ Controller) THERMOCOUPLE E Type	Using Fluke 5500A MPC & using Standard Chart O to °C and mV to °C Chart By Direct/ Comparison Method	-100 °C to 1000 °C	0.32°C
108	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	TEMPERATURE SIMULATION (Indicator/ Recorder/ Controller) THERMOCOUPLE J Type	Using Fluke 5500A MPC & using Standard Chart ? to °C and mV to °C Chart By Direct/ Comparison Method	-200 °C to 1100 °C	0.32°C





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S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
109	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	TEMPERATURE SIMULATION (Indicator/ Recorder/ Controller) THERMOCOUPLE K Type	Using Fluke 5500A MPC & using Standard Chart O to °C and mV to °C Chart By Direct/ Comparison Method	-200 °C to 1300 °C	0.71°C
110	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	TEMPERATURE SIMULATION (Indicator/ Recorder/ Controller) THERMOCOUPLE R Type	Using Fluke 5500A MPC & using Standard Chart O to °C and mV to °C Chart By Direct/ Comparison Method	300 °C to 1750 °C	0.6°C
111	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	TEMPERATURE SIMULATION (Indicator/ Recorder/ Controller) THERMOCOUPLE S Type	Using Fluke 5500A MPC & using Standard Chart O to °C and mV to °C Chart By Direct/ Comparison Method	300 °C to 1750 °C	0.6°C
112	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	TEMPERATURE SIMULATION (Indicator/ Recorder/ Controller) THERMOCOUPLE T Type	Using Fluke 5500A MPC & using Standard Chart O to °C and mV to °C Chart By Direct/ Comparison Method	-200 °C to 400 °C	0.32°C





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S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
113	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source,Measu re)	Thermocouple (S) Type	Using Fluke Multiproduct Calibrator & Fluke Universal Calibrator Using Standard ITS-90 scale By Direct/Comparison Method	100 ºC to 1750 ºC	0.6ºC
114	ELECTRO- TECHNICAL- TIME & FREQUENCY (Measure)	Frequency	Using Timer/Counter (PM 6690) By Direct/Comparison Method	10 Hz to 300 MHz	0.001 % to 0.0065 %
115	ELECTRO- TECHNICAL- TIME & FREQUENCY (Measure)	Period	Using Timer/Counter (PM 6690) By Direct/Comparison Method	10 ms to 1 s	0.0235%
116	ELECTRO- TECHNICAL- TIME & FREQUENCY (Measure)	Time interval Meter, Stop watch, Timer	Using Time calibration Standard signal generator By Direct/Comparison Method	1 sec to 86400 sec	0.6s to 1.53s
117	ELECTRO- TECHNICAL- TIME & FREQUENCY (Source)	BANDWIDTH	Using Fluke 5500A MPC By Direct Method	50 kHz to 300 MHz	6.35%





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S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
118	ELECTRO- TECHNICAL- TIME & FREQUENCY (Source)	FREQUENCY	Using Fluke 5500A MPC By Direct Method	10 Hz to 330 MHz	0.007 % to 0.01 %
119	ELECTRO- TECHNICAL- TIME & FREQUENCY (Source)	PERIOD	Using Fluke 5500A MPC By Direct Method	5 nS to 0.1 mS	0.008%
120	ELECTRO- TECHNICAL- TIME & FREQUENCY (Source)	TIME MARKER	Using Fluke 5500A MPC By Direct Method	5 nS to 100 mS	0.2%
121	MECHANICAL- ACOUSTICS	Sound Level Meter	Using Sound Level Calibrator By Comparision	94dB & 114 dB	0.61dB & 0.70dB
122	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Bore Gauge with Dial (Transmission Accuracy), L.C. 1µm	Using Electronic Dial Calibration Tester/Plunger Dial Gauge By Comparison Method	Upto 1 mm	2.7µm





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123	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Caliper L.C. 0.01mm	Using Caliper Checker & External Micrometer By Comparison Method	Upto 600 mm	17µm
124	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	COATING THICKNESS GAUGE,L.C. 0.1µm	Using Master Foils. By Comparison Method	0 to 1 mm	1.88µm
125	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Cylindrical measuring Pin	Using Lab Concept By Comparison Method	Upto 20mm	0.9 μm
126	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Depth Gauge LC 0.01 mm	Using Depth Checker By Comparison Method	0 to 300 mm	11.5µm





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127	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Depth Micrometer LC 0.01 mm	Using Depth Checker By Comparison Method	Upto 300mm	13µm
128	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Dial Gauge (Lever Type) LC 0.001 mm	Using electronic Dial Calibration Tester/Lab Concept By Comparison Method	0 to 1 mm	2µm
129	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Dial Gauge (Plunger Type) LC 0.001 mm	Using Electronic Dial Calibration Tester By comparison Method	0 to 25 mm	2µm
130	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Dial Snap Gauge LC 0.001 mm Parallelism of Anvil faces	Using Gauge Block Set By Comparison Method	2 mm to 100 mm	2.8µm





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S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
131	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Dial Thickness Gauge LC 0.01 mm	Using Gauge Block Set By Comparison Method	Upto 10mm	7.84µm
132	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Digimatic Indicator Lc 0.001 mm	Using Electronic Dial Calibration Tester By Comparison Method	Upto 25mm	2.0mm
133	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Eletronic Height Gauge LC 0.0001 mm	Using Long Slip Gauges & Surface Plate By comparison Method	Upto 600mm	6.5µm
134	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	External Micrometer LC 0.001 mm LC 0.01 mm	Using Slip Gauge set,Long Slip gauge set,Gauge Block Set by comparison method	0 to 100 mm	1.4µm





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135	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	External Micrometer LC 0.001 mm LC 0.01 mm	Using Slip Gauge Set,Long Slip Gauge,Gauge Block Set By comparison Method	100 mm to 400 mm	12µm
136	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Feeler gauge / Coating Foils	Using lab Concept By Comparison Method	Upto 2.5mm	0.9µm
137	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Height Gauge LC 0.01 mm	Using Caliper Checker & Surface Plate By comparison Method	Upto 600mm	13µm
138	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Measuring Scale	Using electronic tape & Scale Calibrator By Comparison Method	0 to 1000 mm	165µm





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139	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Measuring tape	Using Electronic tape & Scale Calibrator By Comparison Method	Upto 30m	165 *Sqrt(L/1000)µm; (L is in mm)
140	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Micrometer Setting Rod/Length bar	Using Lab Concept By Comparison Method	Upto 400mm	5.7µm
141	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Pistol Caliper LC 0.10 mm	Using Gauge Block Set By Comparison Method	Upto 50mm	80µm
142	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Plain Plug Gauge/OD Gauge/Paddle Gauge	Using Lab Concept By Comparison Method	1 mm to 250 mm	6.1µm





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143	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Plain Ring Gauge/ID Gauge/Setting Ring Gauge	Using Lab Concept/Master Ring Gauge By Comparison Method	4 mm to 250 mm	6.5µm
144	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Radius Gauge	Using Rapid-I(VMM) By Comparison Method	Upto 25mm	6µm
145	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Snap Gauge / Gap Gauge	By Using Gauge Block Set By Comparison Method	Upto 50mm	1.5µm
146	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Snap Gauge /Gap Gauge	Using Gauge Block Set By Comparison Method	100 mm to 300 mm	4.8µm





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147	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Snap Gauge /Gap Gauge	Using Gauge Block Set By Comparison Method	50 mm to 100 mm	2.0µm
148	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Tape & Scale Calibrator	By using Slip Gauge set of 'O' Grade. By comparison method	0 to 1000 mm	9.9µm
149	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Test Sieves	Using Rapid-I(VMM) By Comparison Method	0.045 mm to 1 mm	10.3µm
150	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Thread Measuring Wire	Using lab Concept By Comparison Method	0.17 mm to 6.35 mm	0.9µm





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151	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Thread Pitch gauge	Using Rapid-I(VMM) By Comparison Method	0.605 mm to 6.350 mm	12µm
152	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Thread Plug Gauge (Effective Diameter)	Using Lab Concept & Thread Measuring Wire By Comparison Method	3 mm to 250 mm	4.9µm
153	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Thread Ring Gauge (Effective Diameter)	Using Lab Concept & master Ring gauge By Comparison Method	4 mm to 250 mm	5.1µm
154	MECHANICAL- DIMENSION (PRECISION INSTRUMENTS)	CALIPER CHECKER	By using Slip Gauge set of 'O' Grade & Electronic Height Gauge. By Comparison Method	0 to 600 mm	6µm





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155	MECHANICAL- PRESSURE INDICATING DEVICES	Dial and Digital Vacuum Gauge	Using Digital Vacuum Gauge with Hand Pump By Comparison Method as per DKD Standard By Comparison Method Digital Pressure Gauge with Hand Pump Standard Based on DKD-R-6-1	(-) 0.88 bar to -0.1 bar	0.014 bar
156	MECHANICAL- PRESSURE INDICATING DEVICES	Pneumatic Pressure Gauge	Using Digital Pressure Gauge with Hand Pump By comparison Method as per DKD R6-1 By Comparison Method Digital Pressure Gauge with hand pump Standard based on DKD-R-6-1	0 bar to 35 bar	0.041 bar
157	MECHANICAL- PRESSURE INDICATING DEVICES	Pressure Hydraulic Dial and Digital Pressure gauge	Using Hydraulic Dead Weight Tester CPB5000 By Direct Method UUC to Standard based on DKD-R-6-1	0.3 bar to 100 bar	0.034bar





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158	MECHANICAL- PRESSURE INDICATING DEVICES	Pressure Hydraulic Dial and Digital Pressure gauge	Using Hydraulic Dead Weight Tester CPB5000 By Direct Method UUC to Standard based on DKD-R-6-1	100 bar to 1000 bar	0.25 bar
159	MECHANICAL- TORQUE GENERATING DEVICES	Torque Wrench & Torque Meter (Type Il Class-A)	Using Electronic Torque Wrench tester as per ISO 6789-1 & 2 (2017)	100 Nm to 1000 Nm	1.38% of rdg
160	MECHANICAL- VOLUME	Pipette/Burette/Meas uring Cylinder/Volumeteric Flask/Graduated jar/Can	Using Standard Weights of Accuracy Class E1 Precision Balance(d=0.01 mg , d=0.1 mg)& Distilled Water of known Density By Gravitational Method Based on ISO 4787	1 ml to 2 ml	7µl
161	MECHANICAL- VOLUME	Pipette/Burette/Meas uring Cylinder/Volumeteric Flask/Graduated jar/Can	Using Standard Weights Of Accuracy Class E1 Precision Balance (d=0.01 mg , d=0.1 mg )& Distilled Water of Known Density By Gravimetric Method based on ISO 4787	100 ml to 200 ml	1ml





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162	MECHANICAL- VOLUME	Pipette/Burette/Meas uring Cylinder/Volumeteric Flask/Graduated jar/Can,	Using Standard Weights Of Accuracy Class E1 Precision balance (d=0.01 mg , d=0.1 mg) & Distilled water of known Density By Gravimetric Method Based On ISO 4787	5 ml to 50 ml	14µI
163	MECHANICAL- WEIGHTS	Weight	Using E1 class weight set and semi micro weighing balance of 0.01mg and 0.1mg readability, Direct comparison using ABBA weighing cycle as per OIML R111-1 for weights of F2 class and coarser.		0.03mg





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164	MECHANICAL- WEIGHTS	Weight	Using E1 class weight set and semi micro weighing balance of 0.01mg and 0.1mg readability, Direct comparison using ABBA weighing cycle as per OIML R111-1 for weights of F2 class and coarser.	10 g	0.04mg
165	MECHANICAL- WEIGHTS	Weight	Using E1 class weight set and semi micro weighing balance of 0.01mg and 0.1mg readability, Direct comparison using ABBA weighing cycle as per OIML R111-1 for weights of F2 class and coarser.	10 mg	0.03mg





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166	MECHANICAL- WEIGHTS	Weight	Using E1 class weight set and semi micro weighing balance of 0.01mg and 0.1mg readability, Direct comparison using ABBA weighing cycle as per OIML R111-1 for weights of F2 class and coarser.	100 g	0.19mg
167	MECHANICAL- WEIGHTS	Weight	Using E1 class weight set and semi micro weighing balance of 0.01mg and 0.1mg readability, Direct comparison using ABBA weighing cycle as per OIML R111-1 for weights of F2 class and coarser.	100 mg	0.03mg





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168	MECHANICAL- WEIGHTS	Weight	Using E1 class weight set and semi micro weighing balance of 0.01mg and 0.1mg readability, Direct comparison using ABBA weighing cycle as per OIML R111-1 for weights of F2 class and coarser.	2 g	0.03mg
169	MECHANICAL- WEIGHTS	Weight	Using E1 class weight set and semi micro weighing balance of 0.01mg and 0.1mg readability, Direct comparison using ABBA weighing cycle as per OIML R111-1 for weights of F2 class and coarser.	2 mg	0.03mg





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170	MECHANICAL- WEIGHTS	Weight	Using E1 class weight set and semi micro weighing balance of 0.01mg and 0.1mg readability, Direct comparison using ABBA weighing cycle as per OIML R111-1 for weights of F2 class and coarser.	20 g	0.04mg
171	MECHANICAL- WEIGHTS	Weight	Using E1 class weight set and semi micro weighing balance of 0.01mg and 0.1mg readability, Direct comparison using ABBA weighing cycle as per OIML R111-1 for weights of F2 class and coarser.	20 mg	0.03mg





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172	MECHANICAL- WEIGHTS	weight	Using E1 class weight set and semi micro weighing balance of 0.01mg and 0.1mg readability, Direct comparison using ABBA weighing cycle as per OIML R111-1 for weights of F2 class and coarser.	200 g	0.4mg
173	MECHANICAL- WEIGHTS	Weight	Using E1 class weight set and semi micro weighing balance of 0.01mg and 0.1mg readability, Direct comparison using ABBA weighing cycle as per OIML R111-1 for weights of F2 class and coarser.	200 mg	0.03mg





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174	MECHANICAL- WEIGHTS	Weight	Using E1 class weight set and semi micro weighing balance of 0.01mg and 0.1mg readability, Direct comparison using ABBA weighing cycle as per OIML R111-1 for weights of F2 class and coarser.	5 g	0.05mg
175	MECHANICAL- WEIGHTS	Weight	Using E1 class weight set and semi micro weighing balance of 0.01mg and 0.1mg readability, Direct comparison using ABBA weighing cycle as per OIML R111-1 for weights of F2 class and coarser.	5 mg	0.03mg





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176	MECHANICAL- WEIGHTS	Weight	Using E1 class weight set and semi micro weighing balance of 0.01mg and 0.1mg readability, Direct comparison using ABBA weighing cycle as per OIML R111-1 for weights of F2 class and coarser.	50 g	0.04mg
177	MECHANICAL- WEIGHTS	Weight	Using E1 class weight set and semi micro weighing balance of 0.01mg and 0.1mg readability, Direct comparison using ABBA weighing cycle as per OIML R111-1 for weights of F2 class and coarser.	50 mg	0.03mg





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178	MECHANICAL- WEIGHTS	Weight	Using E1 class weight set and semi micro weighing balance of 0.01mg and 0.1mg readability, Direct comparison using ABBA weighing cycle as per OIML R111-1 for weights of F2 class and coarser.	500 mg	0.03mg
179	MECHANICAL- WEIGHTS	Weights	Using ' E1' Class Weight Set and Semi micro weighing balance of 0.01 mg & 0.1 mg Readability Direct Comparison using ABBA weighing cycle as per OIML R111-1 for weights of F2 Class and coarser	1 mg	0.03mg
180	THERMAL- SPECIFIC HEAT & HUMIDITY	Humidity Chamber, Humidity Controller, Thermohygrometer	Using Standard Humidity Sensor with indicator	10% to 95 %RH at 25°C & 20°C to 40°C at 50%RH	1.186%RH & 0.493°C





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181	THERMAL- TEMPERATURE	Freezers, Oven, Environmental Chamber, Liquid Bath, Incubator, BOD, PT-100, Thermocouples, with or without indicator	Using PRT Pt-100 Sensor with Std indicator (Fluke Chub E4) by Comparision Method,/ Single positioning	-80 ºC to 400 ºC	0.208ºC
182	THERMAL- TEMPERATURE	Glass Thermometer	Using PRT & Indicator with Liquid Well Bath By comparison Method UUC to Standard	-50 ºC to 250 ºC	0.601ºC
183	THERMAL- TEMPERATURE	Thermocouple Sensor with or without indicator, Digital Thermometer, Data Logger, Recorder, Temperature Transmitter with Sensor	Using 'R' type Thermocouple with standard indicator (Fluke Chub E4) by Comparison Method UUC* to Standard	400 ºC to 900 ºC	1.54ºC





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184	THERMAL- TEMPERATURE	Thermocouple Sensor with or without indicator, Digital Thermometer, Data Logger, Recorder, Temperature Transmitter with Sensor	Using 'R' Type Thermocouple with Std. Indicator (Fluke Chub E4) by Comparison method. UUC* to Standard.	900 ºC to 1200 ºC	2.58ºC







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		1 2	Site Facility	Uni	
1	ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Measure)	AC Current 50 Hz to 1kHz	Using 6½ DMM By Direct Comparison Method	10 μA to 100 μA	0.94 % to 0.87 %
2	ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Measure)	AC Current 50 Hz to 1kHz	Using 6½ DMM By Direct Comparison Method	10 mA to 1 A	0.244 % to 0.17 %
3	ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Measure)	AC Current 50 Hz to 1kHz	Using 6½ DMM By Direct Comparison Method	100 µA to 10 mA	0.43 % to 0.244 %
4	ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Measure)	AC Current 50 Hz to 1kHz	Using 6½ DMM By Direct Comparison Method	1A & 10A @50Hz; 10A @50Hz	0.17 % to 0.39 %





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5	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	Using 6½ DMM By Direct/Comparison Method	1 A to 10 A	0.08 % to 0.201 %
6	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	Using 6½ DMM By Direct/Comparison Method	10 μΑ to 100 μΑ	0.347 % to 0.087 %
7	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	Using 6½ DMM By Direct/Comparison Method	100 µA to 100 mA	0.12 % to 0.087 %
8	ELECTRO- TECHNICAL- DIRECT CURRENT (Measure)	DC Current	Using 6½ DMM By Direct/Comparison Method	100 mA to 1 A	0.08%
9	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	AC High Voltage @50Hz	Using HV Divider with kV Meter By Direct/Comparison Method	1 kV to 100 kV	1.48 % to 2.28 %





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10	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	AC Power & Energy (Active/Reactive) 1P & 3P@ 50Hz,UPF to 0.2 Lead Lag (1V 5mA to 1000V, 300A)	Precision Power Analyser By Comparison Method	0.005 W to 300000 W	0.4%/PF
11	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	AC Voltage 50 Hz to 10 kHz	Using 6½ DMM By Direct /Comparison Method	1 V to 1000 V	0.106 % to 0.096 %
12	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	AC Voltage 50 Hz to 10 kHz	Using 6½ DMM By Direct Comparison Method	10 mV to 100 mV	0.532 % to 0.12 %
13	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	AC Voltage 50 Hz to 10 kHz	Using 6½ DMM By Direct/ Comparison Method	100 mV to 1 V	0.12 % to 0.106 %
14	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	Capacitance @ 1kHz	Using RCL Meter Fluke PM 6304 By Direct/Comparison Method	100 pF to 1 mF	1.7 % to 0.988 %





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15	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC Current	Using 6½ DMM By Direct/Comparison Method	10 μA to 100 μA	0.36 % to 0.12 %
16	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC High Voltage	Using H.V Divider with kV Meter by Direct/Comparison Method.	1 kV to 40 kV	1.43 % to 1.59 %
17	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC Resistance	Using 6½ DMM By Direct/Comparison Method	1 mohm to 1 ohm	0.3 % to 0.36 %
18	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC Resistance	Using 6½ DMM By Direct/Comparison Method	1 Ohm to 100 Ohm	0.36 % to 0.03 %
19	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC Resistance	Using 6½ DMM By Direct/Comparison Method	100 Ohm to 100 kOhm	0.03 % to 0.013 %





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20	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC Resistance	Using 6½ DMM By Direct/Comparison Method	1000 kOhm to 10 MOhm	0.013 % to 0.049 %
21	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC Voltage	Using 6½ DMM By Direct Comparison Method	1 mV to 100 mV	0.408 % to 0.013 %
22	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC Voltage	Using 6½ DMM By Direct / Comparison Method	10 V to 1000 V	0.003 % to 0.006 %
23	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	DC Voltage	Using 6½ DMM By Direct/Comparison Method	100 mV to 10 V	0.013 % to 0.003 %
24	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	Harmonics Order	Using HIOKI Make Power analyzer	1st Order to 50th Order	0.5%





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25	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Measure)	Inductance @1kHz	Using Standard LCR Meter FLUKE make by Direct/Comparison method	100 µH to 10 H	0.3 % to 0.185 %
26	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	AC Power(1P2W) @ 50Hz	Using Fluke 5500A MPC By Direct/Comparison Method	1 A @ 0.2Lag to UPF to 10 A @ 0.2Lag to UPF	0.34% to 0.2%/PF
27	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	AC Power(1P2W) @ 50Hz	Using Fluke 5500A MPC By Direct/Comparison Method	50 V @ 0.2Lag to UPF to 600 V @ 0.2Lag to UPF	0.34%to 1.6%/PF
28	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	AC VOLTAGE @ 50 Hz to 10 kHz	Using Fluke 5500A MPC By Direct/ Comparison Method	1 mV to 10 mV	0.327 % to 0.246 %
29	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	AC VOLTAGE @ 50 Hz to 10 kHz	Using Fluke 5500A MPC By Direct/ Comparison Method	10 mV to 100 mV	0.246% to 0.07 %





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30	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	AC VOLTAGE @ 50 Hz to 10 kHz	Using Fluke 5500A MPC By Direct/ Comparison Method	10 V to 1000 V	0.049 % to 0.057 %
31	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	AC VOLTAGE @ 50 Hz to 10 kHz	Using Fluke 5500A MPC By Direct/ Comparison Method	100 mV to 10 V	0.07 % to 0.049 %
32	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	Capacitance @ 1kHz	Using Fluke 5500A MPC By Direct/Comparison Method	0.33 nF to 1.1 mF	2.896 % to 1.555 %
33	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC CURRENT	Using Fluke 5500A MPC By Direct / Comparison Method	1 A to 10 A	0.042 % to 0.08 %
34	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC CURRENT	Using Fluke 5500A MPC By Direct / Comparison Method	10 μA to 100 mA	0.018 % to 0.015 %





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Accreditation Standard Certificate Number Validity NASHIK ENGINEERING CLUSTER, "SAHASTRARASHMI", C-10, MIDC, AMBAD, NASHIK, MAHARASHTRA, INDIA

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S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
35	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC CURRENT	Using Fluke 5500A MPC By Direct / Comparison Method	100 mA to 1 A	0.015 % to 0.042 %
36	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC CURRENT	Using Fluke 5500A MPC By Direct / Comparison Method With CC	50 A to 500 A	0.42 % to 0.72 %
37	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC Power (1P2W)	Using Fluke 5500A MPC By Direct/Comparison Method	50 V to 600 V & 1A to 10A	0.25 % to 1.6 %
38	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC Resistance	Using Fluke 5500A MPC By Direct/Comparison Method	1 mOhm to 330 MOhm	0.086 % to 0.012 %
39	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC VOLTAGE	Using Fluke 5500A MPC By Direct/ Comparison Method	1 mV to 100 mV	0.063 % to 0.008 %





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40	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC VOLTAGE	Using Fluke 5500A MPC By Direct/ Comparison Method	10 V to 1000 V	0.006 % to 0.007 %
41	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	DC VOLTAGE	Using Fluke 5500A MPC By Direct/ Comparison Method	100 mV to 10 V	0.008 % to 0.006 %
42	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	Harmonics Order	Using FLUKE make Multi product Calibrator 5500A	1st Order to 50th Order	0.5%
43	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	Inductance	Using Decade Inductance Box by Direct method	100 µH to 10 H	0.359 % to 0.222 %
44	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	Oscilloscope (Amplitude)	Using FLUKE make MPC 5500A by Direct method	20 mV to 20 V	0.65%





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45	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	Oscilloscope (Bandwidth)	Using FLUKE make MPC5500A by Direct Method	50 Hz to 300 MHz	6.4%
46	ELECTRO- TECHNICAL- ELECTRICAL EQUIPMENT (Source)	Oscilloscope (Time Marker)	Using FLUKE make MPC5500A by Direct Method	5 nS to 100 micro sec.	0.2%
47	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Measure)	'B' Type Thermocouple	Using Multifunction calibrator & using ITS-90 scale for ohm to <sup>o</sup> C & mV to <sup>o</sup> C By Direct/Comparison Method	600 ºC to 1750 ºC	0.6ºC
48	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Measure)	'E' Type Thermocouple	Using Multifunction Calibrator & by using ITS-90 scale for ohms to <sup>o</sup> C & mV to <sup>o</sup> C by Direct/Comparison Method	-100 ºC to 1000 ºC	0.32ºC





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49	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Measure)	'J' Type Thermocouple	Using Multifunction Calibrator & by using ITS-90 scale for ohms to <sup>o</sup> C & mV to <sup>o</sup> C by Direct/Comparison Method	-200 ºC to 1100 ºC	0.32ºC
50	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Measure)	'K' Type Thermocouple	Using Multifunction Calibrator & by using ITS-90 scale for ohms to <sup>o</sup> C & mV to <sup>o</sup> C by Direct/Comparison Method	-200 ºC to 1300 ºC	0.32ºC
51	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Measure)	'R' Type Thermocouple	Using Multifunction Calibrator & by using ITS-90 scale for ohms to <sup>o</sup> C & mV to <sup>o</sup> C by Direct/Comparison Method	300 ºC to 1750 ºC	0.6ºC
52	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Measure)	'S' Type Thermocouple	Using Multifunction Calibrator & by using ITS-90 scale for ohms to <sup>o</sup> C & mV to <sup>o</sup> C by Direct/Comparison Method	300 ºC to 1750 ºC	0.6ºC





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53	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Measure)	'T' Type Thermocouple	Using Multifunction Calibrator & by using ITS-90 scale for ohms to <sup>o</sup> C & mV to <sup>o</sup> C by Direct/Comparison Method	-200 ºC to 400 ºC	0.32ºC
54	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Measure)	RTD (PT-100)	Using Multifunction Calibrator & using ITS-90 scale for ohm to <sup>o</sup> C & mV to <sup>o</sup> C chart by Direct/Comparision method	-200 ºC to 850 ºC	0.27ºC
55	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	RTD (PT-100)	Using Fluke 5500A & Standard ITS-90 Chart ohms to <sup>o</sup> C & mV to <sup>o</sup> C Chart By Direct Method	-200 ºC to 850 ºC	0.30ºC
56	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	Thermocouple ( B Type)	Using Fluke 5500A MPC & using Standard ITS-90 Chart Ohms to <sup>o</sup> C & mV to <sup>o</sup> C By Direct Method	600 ºC to 1750 ºC	0.65ºC





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57	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	Thermocouple (E Type)	Using Fluke 5500A & Standard ITS-90 Chart ohms to <sup>o</sup> C & mV to <sup>o</sup> C Chart By Direct Method	-100 ºC to 1000 ºC	0.40ºC
58	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	Thermocouple (J Type)	Using Fluke 5500A & Standard ITS-90 Chart ohms to <sup>o</sup> C & mV to <sup>o</sup> C Chart By Direct Method	-200 ºC to 1100 ºC	0.40ºC
59	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	Thermocouple (K Type)	Using Fluke 5500A & Standard ITS-90 Chart ohms to <sup>o</sup> C & mV to <sup>o</sup> C Chart By Direct Method	-200 ºC to 1300 ºC	0.40ºC
60	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	Thermocouple (R Type)	Using Fluke 5500A & Standard ITS-90 Chart ohms to <sup>o</sup> C & mV to <sup>o</sup> C Chart By Direct Method	100 ºC to 1750 ºC	0.65ºC
61	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	Thermocouple (S Type)	Using Fluke 5500A & Standard ITS-90 Chart ohms to <sup>o</sup> C & mV to <sup>o</sup> C Chart By Direct Method	300 ºC to 1750 ºC	0.65ºC





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62	ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source)	Thermocouple (T Type)	Using Fluke 5500A & Standard ITS-90 Chart ohms to <sup>o</sup> C & mV to <sup>o</sup> C Chart By Direct Method	-200 ºC to 400 ºC	0.40ºC
63	ELECTRO- TECHNICAL- TIME & FREQUENCY (Measure)	Time interval Meter, Stop watch, Timer	Using Time calibration Standard signal generator By Direct/Comparison Method	1 sec to 86400 sec	0.6s to 1.53s
64	MECHANICAL- ACCELERATION AND SPEED	Speed (Centrifuge)	Using Tachometer By Comparison Method	150 rpm to 8000 rpm	1.9 % to 0.2 %
65	MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Electronic Height Gauge , L.C. 0.1µm	Using Long Slip Gauge & Surface Plate By Comparison Method	Upto 600mm	6.5µm





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66	MECHANICAL- PRESSURE INDICATING DEVICES	Dial and Digital Vacuum Gauge	Using Digital Vacuum Gauge with Hand Pump By Comparison Method as per DKD Standard By Comparison Method Digital Pressure Gauge with Hand Pump Standard Based on DKD-R-6-1	(-) 0.88 bar to -0.1 bar	0.014 bar
67	MECHANICAL- PRESSURE INDICATING DEVICES	Pneumatic Pressure Gauge	Using Digital Pressure Gauge with Hand Pump By comparison Method as per DKD R6-1 By Comparison Method Digital Pressure Gauge with hand pump Standard based on DKD-R-6-1	0 bar to 35 bar	0.041 bar
68	MECHANICAL- WEIGHING SCALE AND BALANCE	Digital Weighing Balance # Redability = 0.01 mg & courser	By Using 'E1' Class Weights Calibration of Weighing Balance of accuracy class 1 & coarser as OIML R-76-1	to upto 82 g	0.04mg





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69	MECHANICAL- WEIGHING SCALE AND BALANCE	Digital Weighing Balance ,Redability = 0.1 mg & courser	By using 'E1' Class Weights Calibration of Weighing Balance of Accuracy Class I & coarser Per OIML R-76-1	to upto 200 g	0.14g
70	THERMAL- SPECIFIC HEAT & HUMIDITY	Humidity Chamber, Humidity Controller, Thermohygrometer	Using Standard Humidity Sensor with indicator	10% to 95 %RH at 25°C & 20°C to 40°C at 50%RH	1.186%RH & 0.493°C
71	THERMAL- TEMPERATURE	Freezers, Oven,Environmental Chamber,Liquid Bath, Incubator, BOD Incubator at Multiple Position	Using Multi-point Standard RTD(09) minimum, and Hioki (Data Logger) by Multi Position method	-80 ºC to 400 ºC	4.975ºC
72	THERMAL- TEMPERATURE	Furnace Mapping	9 point calibration by direct method using K-type sensor and data logger	250 °C to 1200 °C	8.55°C
73	THERMAL- TEMPERATURE	Thermocouple Sensor with or without indicator, Digital Thermometer, Data Logger, Recorder, Temperature Transmitter with Sensor	Using 'R' type Thermocouple with standard indicator (Fluke Chub E4) by Comparison Method UUC* to Standard	400 ºC to 900 ºC	1.54ºC





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\*The validity is extended for one year up to 06.11.2022

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74	THERMAL- TEMPERATURE	Thermocouple Sensor with or without indicator, Digital Thermometer, Data Logger, Recorder, Temperature Transmitter with Sensor	Using 'R' Type Thermocouple with Std. Indicator (Fluke Chub E4) by Comparison method. UUC* to Standard.	900 ºC to 1200 ºC	2.58ºC

\* CMCs represent expanded uncertainties expressed at approximately the 95% level of confidence, using a coverage factor of k = 2.

