**NATIONAL PHYSICAL AND STANDARDS LABORATORY (NPSL)**

Name of Centre:- **CHEMICAL METROLOGY DIVISION**

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| 1.1 Name of Sub-Centre/R&D Discipline/ Field: **Environmental Analytical Laboratory (EAL)** | | | |
| **Sr. No.** | **Name of Major Equipment** | **Qty.** | |
|
|  | Atomic Absorption Spectrophotometer | 1 | |
|  | Elemental Analyzer (CHNS/O) | 1 | |
|  | FTIR Spectrometer | 1 | |
|  | High Pressure Liquid Chromatograph | 1 | |
|  | Ion Analyzer | 1 | |
|  | Polarograph | 1 | |
|  | UV/visible Spectrophotometer | 1 | |
| 1.1 Name of Sub-Centre/R&D Discipline/ Field**: Analytical and Spectrophotometric Measurement Laboratory (ASML)** | | | |
|  | Atomic Absorption Spectrophotometer A. Analyst 100,  Perkin Elmer, USA Serial No. 04051090305  Part No. N040-0026  (Equipment ID: AAS/PE/Analyst100) | | 1 |
|  | Moisture Analyzer  Sartorius MA 50 | | 1 |
|  | Thermo-hygrometer  TH/AAS-1 | | 1 |
| * 1. Name of Sub-Centre/R&D Discipline/ Field**: Physico Chemical Measurement Section** | | | |
|  | Flame photometer Model AFP-100 | 01 | |
|  | Bench top Turbidity Meter | 01 | |
|  | ISE Meter Orion, 4 Star | | 01 |
|  | pH/EC/TDS Meter HI-91301  , HANNA | | 01 |
|  | Conductivity Meter Model 3 Star, Orion | | 01 |

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|  | Conductivity Meter Model 5003-MC-1 | 01 |
|  | Refractometer Abbes Model WZS-1 (2W) | 01 |
|  | DO Meter | 01 |
|  | UV-VIS Spectrophotometer Model T 80 | 01 |
|  | NMR Spectrometer Model EM-390 Varian | 01 |
|  | BOD Apparatus with Thermostatic Cabinet | 01 |
|  | Water Distillation Apparatus | 01 |
|  | Electronic Analytical Balance | 01 |
|  | Water Bath, Thermostat Control | 01 |
|  | Drying Oven Model –DL-103A | 01 |
|  | Centrifuge, Model EBA-20 | 01 |
|  | Grinding Mill Model-Rs-100 | 01 |
|  | Fuming Hood Model – EFH-5 A 8, ESCO | 01 |
|  | UV-VIS Spectrophotometer Model-Spectronic 21-D | 01 |
|  | Biomedical Freezer | 01 |

**B.**

**List of Experts**

**Chemical Metrology Division**

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| **S. #** | **List of Experts** | **Designation** | **Major Field** | |
| **Education** | **Field of Expertise** |
|  | Dr. Muhammad Iqbal | CSO/DG | Ph.D - | Bio Technology |
|  | Dr. S. S. Tahir Malik | CSO / Director | Ph.D - | Analytical Chemistry |
|  | Dr. Hajra Masood | PSO | Ph.D - | Inorganic / Analytical Chemistry (metallurgy and its extraction) |
|  | Dr. Naseem Rauf | PSO | Ph.D - | Environmental / Analytical Chemistry |
|  | Mr. M. Younus Kalim | SSO | M.Sc. - Chemistry |  |
|  | Dr. Saima Imad | SSO | Ph.D - | Organic Chemistry |
|  | Dr. Muhammad Tahseen Aslam | SSO | Ph.D - | Environmental Engineering / urban water Management |
|  | Dr. Syeda Sabahat Kazmi | SSO | Ph.D - | Microbiology |
|  | Dr. Raheela Chaudhry | SSO | Ph.D - | Biological Science Molecular Biology |
|  | Dr. Muhammad Tauseef Chaudhry | SSO | Ph.D - | Microbiology |
|  | Ms. Fouzia Hussain | SO | M.Phil | Microbiology |
|  | Ms. Razia Kalsoom | SO | M.Sc | Chemistry |
|  | Ms. Farah Shahzadi | SO | M.Sc- | Bio-Chemistry |
|  | Mr. Sanum Saleem | SO | M.Sc. | Chemistry |

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| **C. Services** | |
|  | **Testing / Analytical:**  Provides services to the Public and Private Clients in the above mentioned field. |

1. **Name of Centre:- Physical Metrology Division**

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| * 1. Name of Sub-Centre/R&D Discipline/Field: **Pressure Metrology** | | |
|  | **Name of Major Equipment** | **Quantity** |
|
| 1 | Dead Weight Tester  (P — 01) | 1 |
| 2 | Hydraulic Dead Weight Tester  (P — 01/R) | 1 |
| 3 | Hydraulic Dead Weight Tester  (P — 09) | 1 |
| 4 | Digital Pressure Indicator  (Reference Gauge) (P — 15) | 1 |
| 5 | Digital Pneumatic Calibrator  (P — 10) | 1 |
| 6 | Gas Lubricated Piston Pressure Gauge  (P — 18) | 1 |
| 7 | Digital Pressure Indicator  (Reference Gauge) (P — 13) | 1 |
| 8 | Reference Barometer  (P — 12) | 1 |
| 9 | Precision Barometer  (P — 11) | 1 | |

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| 1.1 Name of Sub-Centre/R&D Discipline/Field: **Mass Metrology** | | |
|  | Set of E 1 class Masses 1 mg to 20 kg | 30 Pcs |
|  | Set of E 2 class Masses 1 mg to 20 kg | 30 Pcs |
|  | Set of F 1 class Masses 1 mg to 20 kg | 30 Pcs |
|  | Set of F 2 class Masses 1 mg to 20 kg | 30 Pcs |
|  | Analytical Mass Comparator AX1006 Mettler Toledo, Swizerland  Capacity: 1000 g, Readability:1 ug | 01 |
|  | Mass Comparator CCE6  Sartorius, Germany  Capacity: 6.1 g, Readability: 0.1 ug | 01 |
|  | Mass Comparator CC111  Sartorius, Germany  Capacity: 111 g, Readability: 1 ug | 01 |
|  | Mass Comparator CC10000 U-L Sartorius, Germany  Capacity: 10 Kg, Readability: 10 ug | 01 |
|  | Mass Comparator CC5000 S-L Sartorius, Germany  Capacity: 50 Kg, Readability: 1 mg | 01 |
|  | Mass Comparator ME 414 S  Sartorius, Germany  Capacity: 410 g, Readability: 0.1 mg | 01 |
|  | Mass Comparator CC 64K  Sartorius, Germany  Capacity: 64 Kg, Readability: 50 mg | 01 |

**Note: Serial No.8 is presently not in a working condition.**

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| 1.1 Name of Sub-Centre/R&D Discipline/Field **TIME & FREQUENCY** | | |
|  | Cesium Beam Frequency Std.  Model # HP-5061B | 01 |
|  | Rubidium Frequency Std.  Model # R&S:XSRM.238.4011/02 | 01 |
|  | Universal Time interval Counter  Model # HP 53370 B | 01 |
|  | Microwave counter  Model # TR5211 | 01 |
|  | Universal Counter  Model # Schlum.2711 | 01 |
|  | Standard frequency receiver R&S: XKE2.291.0017/020 | 01 |
|  | Phase Comparator  Model # HP-K34-59991A | 01 |
|  | Digital Phase meter  Model # Wiltron-355B | 01 |
|  | Degausser  Model # HP-10638A | 01 |
|  | Calibration Generator  Model # Tekt. PG-506 | 01 |
|  | Time Mark Generator  Model #Tekt. TG-501 | 01 |
|  | Leveled Sine-Wave Generator  Model # Tekt. SG-504 | 01 |
|  | Distortion Measurement Set  Model # HP-339A | 01 |

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|  | Distribution Amplifier  Model #HP-5087 A | 01 |
|  | Phase Recorder  Model #:XKP.156.3541.02 | 01 |
|  | Oscilloscope 200MHz,Schlumberger | 01 |
|  | Dual/Variable Power Supply  Model/Sr.#:611-127/66383,66387, | 01 |
|  | 20 MHZ Oscilloscope TRIO,  Model/Sr.# CS-1566A/2010208 | 01 |
|  | Sinclair Multimeter, Thandar  Model No. DM-350/350/16289, UK. | 01 |
|  | 20 MHZ Oscilloscope, Kikusui, Japan  Model/Sr. No.COS-5020 TM/48300518 | 01 |
|  | Digital Multimeter, Yokogawa, Japan  Model/Sr. No. FG-2502A/00376 | 01 |
|  | 2MHZ Function Generator Schlumberger.  Model/Sr.No.4415/ 710073-1404. | 01 |
|  | Function Generator, Lodestar  Model/Sr. No. FG-2020A | 01 |
|  | Data-logger  Model/Sr. No 2200B/2775013,Fluke | 01 |
|  | 11MHZ Function Generator  Model/Sr.# FG-502/B092891,Tektronix | 01 |
|  | Automatic voltage stabilizer  ModelNo.MVS-10,Taiwan. | 01 |
|  | Synthesized Receiver, SONY  Model/Sr.#: ICF-7600D | 01 |

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|  | Standard Frequency Receiver R8S:XKEZ.291.0017.02,FNr.301411/005 | 01 |
|  | Power Supply for Rubidium Std.,  XSRMZ,R8S:237.8013.02/FNr.314799/077 | 01 |
|  | Power supply for VLF Receiver, Model/Sr.# XSRM-Z R&S:237.8013.02/FNr.871818/035 | 01 |
|  | Frequency Convertor | 01 |
|  | AM/FM signal Generator Model 2024 | 01 |
|  | Decade attenuator(Variable), Type:145D-TBR | 01 |
|  | GPS-Controlled Frequency standard, Fluke  Model No.910R | 01 |
|  | Distribution Amplifier  Model No. A5-12 | 01 |
|  | Frequency/time Phase measurement System, Model No. A7 | 01 |
|  | Digital Stopwatch Q&Q Japan CBM Corporation, China | 01 |
|  | Audio Analyzer  Model No. U8903A | 01 |
|  | FM Transmitter Type: BTF-5/50W/ | 01 |
|  | Digital stopwatch, Model No HS-60 |  |
|  | GPS Disciplined Rubidium Frequency Standard, Model # GPS10RBN | 01 |

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|  | Digital Multimeter, Model # 287 | 01 |
|  | Single Channel Power meter  Model No.E4416A Agilent | 01 |
|  | Universal Counter/Timer  Model No.53230A | 01 |
|  | Attenuator(Manual Step) | 01 |
|  | Attenuator(Manual Step) | 01 |
|  | Rubidium Frequency Standard  Model No.RFS10F | 01 |
|  | Sound level meter, Model No.TES-1351 | 01 |
|  | Sound level calibrator,  Model No.TES-1356 | 01 |
|  | Digital Tachometer,  Model No.DT-2232A | 01 |
|  | Digital Tachometer,  Model No.2234B | 01 |
|  | Frequency Generator  SMF 100A | 01 |
|  | Frequency Counter  53152A | 01 |
|  | Oscilloscope RTO 1002 | 01 |

**Note: Serial No.1,3,5,7,9,13,15,16,18,19,20,21,23,24,27,28,34,and 36 are presently out of order.**

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| 1.1 Name of Sub-Centre/R&D Discipline/Field: **Electrical Metrology** | | |
|  | Electro-Chemical DC Voltage Standard Primary Standard Cell Oven  S.#: 412 – S, SCO – 106, JRL, USA | 01 |
|  | Electr-Chemical DC Voltage Standard Primary Standard Cell Oven  S.#: 413 – S, SCO – 106, JRL, USA | 01 |
|  | Electro-Chemical DC Voltage Standard  Secondary Standard Cell  S.#: 229886, 5643 – H-Tinselly, UK | 01 |
|  | Electro-Chemical DC Voltage Standard  Secondary Standard Cell  S.#: 229883, 5643 – H-Tinselly, UK | 01 |
|  | Electronic DC Voltage Ref. Std.  S.#: 2790002, 731 – B, Fluke, USA | 01 |
|  | Primary Resistance Oven  S.#: 68, PRO – 106, JRL, USA | 01 |
|  | DC Voltage Calibration System  S.#: 2760005 – AA  7105 – A, Fluke, USA | 01 |
|  | DC Current Comparator  S.#: 48200, 9930 – Guildline, Canada | 01 |
|  | Electro-Chemical Standard Cell  Nominal Value: 1.01868 V  BC -9A, China | 02 |
|  | Universal Std. Potentiometer  PVP - 1001J, JRL, USA, S.#: 108 | 01 |
|  | Precision Voltage Divider  S.#: 45, DV - 1500, JRL, USA | 01 |
|  | Primary Resistance Bridge  S.#: 236, PRB - 205, JRL, USA | 01 |
|  | Null Detector  S.#: 517, ND - 106, JRL, USA | 01 |
|  | Voltage Divider  S.#: 301, VDR - 307, JRL, USA | 01 |
|  | Double Purpose Resistance Bridge  S.#: 199 - 857, QJ - 36, China | 01 |
|  | DC Potentiometer  S.#: 151, UJ - 31, China | 01 |
|  | Reflecting Galvanometer  S.#: 112, AC - 15, China | 01 |
|  | DC Power Supply  S.#: 180, YJ - 49, China | 01 |
|  | Digital Multimeter, (Replaced with Fluke - 75), S.#: 3025036  8010-A, Fluke | 01 |
|  | 4 -Terminal Standard Resistor 0.0001 Ω, S.#: 44725  WLN - 10, H&B | 01 |
|  | 4 - Terminal Standard Resistor  0.001 Ω  S.#: 5820367, WLN - 09, H&B | 01 |
|  | 4- Terminal Standard Resistor   0.01 Ω  S.#: 5820422, WLN - 08, H&B | 01 |
|  | 4 – Terminal Standard Resistor 0.1 Ω  S.#: 5820409, WLN – 07, H&B | 01 |
|  | 4 – Terminal Standard Resistor 1 Ω  S.#: 5814057, WLN - 06, H&B | 01 |
|  | 4 – Terminal Standard Resistor 10 Ω  S.#: 5814028, WLN - 05, H&B | 01 |

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|  | 4 – Terminal Standard Resistor 100 Ω  S.#: 5814024, WLN - 04, H&B | 01 |
|  | 4 – Terminal Standard Resistor 1 kΩ  S.#: 5813995, WLN - 03, H&B | 01 |
|  | 4 – Terminal Standard Resistor 10 kΩ  S.#: 5853701, WLN – 02, H&B | 01 |
|  | Decade Resistance Box  S.#: 079762, RD-6A-1, AIOP | 02 |
|  | AC Voltage Stabilizer 1000 VA  S.#: 1988, Philips, Local | 01 |
|  | Digital Multimeter  S.#: 3416-A-22623,  34401-Agilent, USA | 01 |
|  | AC/DC Current Shunt  S.#: 6515003, 5020-Y, Fluke, USA | 01 |
|  | Vernier Potentiometer  S.#: L – 357747, CIC, England | 01 |
|  | Oscillo-Graph  S.#: 037 – 585, SC – 10, China | 01 |
|  | Power Supply for Oscillograph  S.#: 003 – 85 – 1, FY – 49, China | 01 |
|  | Electrodynamics AC/DC Voltmeter  S.#: 362552, CIC, England | 01 |
|  | Electrodynamics AC/DC Ammeter  S.#: 385088, CIC, England | 01 |
|  | Multi Standard Resistor (2-Terminal)  S.#: 317, MRS-105, JRL, USA | 01 |
|  | Multi Standard Resistor (4-Terminal)  S.#: 279, MRS-106, JRL, USA | 01 |
|  | Variable Transformer 3kV (Variac)  S.#: 05137, China | 01 |
|  | Thermograph  S.#: 8525, DWWJ – 2-1, China | 01 |
|  | 4-Terminal Standard Resistor 10Ω  S.#: 47725, 9330, Guildline, Canda | 01 |
|  | 4-Terminal Standard Resistor 0.1Ω  S.#: 46294, 9330, Guildline, Canda | 01 |
|  | 2-Terminal Standard Resistor 0.1Ω/3A  S.#: L – 359164, CIC, England | 01 |
|  | 2-Terminal Standard Resistor 1Ω / 1A  S.#: : L – 353898, CIC, England | 01 |
|  | 2-Terminal Standard Resistor  10 Ω / 0.3A  S.#: L – 359132, CIC, England | 01 |
|  | 2-Terminal Standard Resistor  100 Ω / 0.1 A  S.#: L – 353931, CIC, England | 01 |
|  | 2-Terminal Standard Resistor  1kΩ / 30V  S.#: L – 359162-A, CIC, England | 01 |
|  | 2-Terminal Standard Resistor 10 kΩ / 100V  S.#: L – 353979, CIC, England | 01 |
|  | 2-Terminal Standard Resistor 1 MΩ  S.#: L – 358728, CIC, England | 01 |
|  | Analog Ampere Mete  S.#: r | 01 |
|  | Electro-Chemical Std. Cell Oven  S.#: BDK – 1, China | 01 |
|  | Stabilized Power Supply  S.#: MK – 2, TSV – 70, Farnel, UK | 01 |
|  | Electronic DC Voltage Ref. Standard  S.#: 7926001, 732-B – 7001, Fluke | 01 |
|  | External Battery for 732-A, Fluke  S.#: 7935001, 732-B - 7002, Fluke | 01 |
|  | 7½ Digit nV / µΩ Meter  S.#: US-36002969,  34420-Agilent, USA | 01 |
|  | 4-Terminal Standard Resistor 1Ω  S.#: 7914005, 742-1-A, Fluke | 01 |
|  | 4-Terminal Standard Resistor 10 kΩ  S.#: 7923001, 742-10k-A, Fluke | 01 |
|  | Resistance Standard 10 MΩ  S.#: 63 - 581,9334-10MΩ, Guildline | 01 |
|  | Resistance Standard 100 MΩ  S.#: 63 – 795, 9334-100MΩ, Guildline | 01 |
|  | AC Shunt 10 kΩ / 10 W  S.#: 7320, Guildline | 01 |
|  | AC Shunt 1Ω / 10 W  S.#: 7320, Guildline | 01 |
|  | Universal Calibration System  S.#: 44003, 9100-Wavetek, USA | 01 |
|  | Transit Case for 732-A, Fluke  S.#: Nil | 01 |
|  | Analog DC milli Volt Meter  S.#: Nil, ,0 --- 25 mV, Japan | 01 |
|  | Analog DC milli Ammeter  (Moving Coil)  S.#: Nil, 94570, Japan | 01 |
|  | Current Reversing Kay  S.#: Nil, Local | 01 |
|  | AC Voltage Stabilizer 1000 VA  S.#: Nil, Philips, Local | 01 |
|  | AC Voltage Stabilizer 1000 VA  S.#: Nil, Simtech, Local | 01 |
|  | Thermo Hygrometer  S.#: Nil 140102724,  OMEGAETTE, USA | 01 |
|  | Pressure Meter, S.#: Nil | 01 |
|  | Thermometer, S.#: Nil | 01 |
|  | Standard Resistor 1 GΩ  S.#: 63 – 234, 9334-1GΩ, Guildline | 01 |
|  | DC Current Shunt  0.000333Ω --- 10000 Ω / 300 A --- 0.00001 A  S.#: 66188, 9211-A, Guildline | 01 |
|  | Digital Multimeter (was replaced for 8010-A, Fluke) S.#: Nil, 75-Fluke, USA | 01 |
|  | Electro-Chemical Standard Cell  Nominal Value:1.01850V, 1.01851 V  S.#: 1019, BC – 11, China | 01 |
|  | Digital Null Detector Keithely, USA S.#: 0912793 2182 | 01 |
|  | Digital Tachometer  S.#: C – 58545, DT-2232-A, Taiwan | 01 |
|  | 8½ Digit Multimeter  3458-A, Agilent, USA | 01 |
|  | 6½ Digit LCR Meter  S.#: PO – 9085041, PM – 6306, Fluke | 01 |
|  | Multifunction Calibrator  S.#: 9797205, 5720-A, Fluke | 01 |
|  | Precision Power Amplifier  S.#: 9798003, 5725-A, Fluke | 01 |
|  | Digital Humidity & Temperature Meter  S. 130601884, RS - 1364 | 01 |
|  | Temperature / Humidity Meter  S.No. 140102724  HH-311, OMEGAETTE | 01 |
|  | 8½ Digit Reference Multimeter  S.No. 331470410,  8508-A/01-210, Fluke | 01 |
|  | 4-Cell DC Voltage Reference Standard  Set of four  S.No. i. 3163005  ii 3099002  iii. 3190004  iv 3190010  734-A/40-240, Fluke | 01 |
|  | Digital Clamp Meter  S.No. W-8039094 Kyoritsu-2002-PA | 01 |
|  | AC Voltage Reference Standard  S.#: 2743019, 510-A, Fluke | 01 |
|  | Thermal Transfer Standard  S.#: 47 – 877, 540 – B, Fluke | 01 |
|  | Standard Air Capacitor  1 µF S.#: 7027, 1403-K, GR, USA | 01 |
|  | Standard Air Capacitor  1000 pF S.#: 3089 1404-A, GR, USA | 01 |
|  | Standard Air Capacitor 100 pF S.#: 3139 1403-B, GR, USA | 01 |
|  | Standard Air Capacitor 10 pF, S.#: 3219, 1403-C, GR, USA | 01 |
|  | Standard Air Capacitor 0.1 µF  S.#: 26295, 1409-T, GR, USA | 01 |
|  | Standard Air Capacitor ,1 µF  S.#: 20220, 1409-Y, GR, USA | 01 |
|  | Standard Air Capacitor, 0.1 µF  S.#: Nil, C -4, AIOP, France | 01 |
|  | Standard Capacitor 0.1 µF  S.#: Nil, C -4, AIOP, France | 01 |
|  | Standard Air Capacitor, 0.1 µF  S.#: Nil, C -4, AIOP, France | 01 |
|  | Standard Air Capacitor, 0.1 µF  S.#: Nil, C -4, AIOP, France | 01 |
|  | Standard Air Capacitor, 0.1 µF  S.#: Nil, C -4, AIOP, France | 01 |
|  | Standard Air Capacitor, 0.1 µF  S.#: Nil, C -4, AIOP, France | 01 |
|  | Standard Inductor, 1 H  S.#: Nil, L -4, AIOP, France | 01 |

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|  | Standard Inductor, 1 H  S.#: Nil, L -4, AIOP, France | 01 |
|  | Standard Inductor, 1 H  S.#: Nil, L -4, AIOP, France | 01 |
|  | AC Calibrator  S.#: 30225, AC – 125, JRL, USA | 01 |
|  | Power Amplifier  S.#: 50219, PA – 225, JRL, USA | 01 |
|  | Thermal Voltage Transfer Standard  S.#: 2795013, 540-B, Fluke |  |
|  | Universal Counter Timer  S.#: 2900008, 7261-A, Fluke, USA |  |
|  | Analog AC/DC Watt Meter  S.#: AE - 24569, S-91-1-28, Sangamo |  |
|  | Power Meter  S.#: 000257, 2085, Farnel, UK | 01 |
|  | Function Generator (Enertic)  S.#: 710039 / 408, CRC-4420, France | 01 |
|  | Pico Farad Capacitance Meter  S.#: L 0 357133, CIC, England |  |
|  | Galvano Meter (35---0 ---35)  S.#: 6801, SK-5000, Japan |  |
|  | Function Generator  S.#: B - 092891, TM - 501, Tektronix | 01 |
|  | RC Oscillator  S.#: 321209, VP - 7220-C, National | 01 |
|  | RF. Transformer 75 Ω / 50 Ω  S.#: 52509-015, TK - 2509, M.I, UK | 01 |
|  | Sub Standard Coil 1 M Ω / 500 V  S.#: L- 344540, CIC England |  |
|  | Standard Self Inductor  S.#: 146082, RS - 102, ANDO, Japan | 01 |

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|  | Standard Self Inductor  S.#: 1460889, RS - 104, ANDO, Japan | 01 |
|  | Standard Self Inductor  S.#: 046084, RS - 106, ANDO, Japan | 01 |
|  | Standard Self Inductor  S.#: 146085, RS - 108, ANDO, Japan | 01 |
|  | Standard Self Inductor  S.#: 146086, RS - 110, ANDO, Japan | 01 |
|  | Thermal Voltage Converter 0.5 V  S.#: 2630012, A - 55, Fluke, USA | 01 |
|  | Thermal Voltage Converter 1 V  S.#: 2735002, A - 55, Fluke, USA | 01 |
|  | Thermal Voltage Converter 2 V  S.#: 239500, A - 55, Fluke, USA | 01 |
|  | Thermal Voltage Converter 3 V  S.#: 2735014, A - 55, Fluke, USA | 01 |
|  | Thermal Voltage Converter 5 V  S.#: 2705004, A - 55, Fluke, USA | 01 |
|  | Thermal Voltage Converter 10 V  S.#: 2705004, A - 55, Fluke, USA | 01 |
|  | Thermal Voltage Converter 20 V  S.#: 2460004  A – 55, Fluke, USA | 01 |
|  | Thermal Voltage Converter 30 V  S.#: 2625003, A – 55, Fluke, USA | 01 |
|  | Thermal Voltage Converter 50 V  S.#: 2695009, A - 55, Fluke, USA | 01 |
|  | Current Shunt 10 m. Amp  S.#: 2695006, A - 40, Fluke, USA | 01 |
|  | Current Shunt 20 m. Amp  S.#: 2720001, A - 40, Fluke, USA | 01 |

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|  | Current Shunt 30 m.Amp  S.#: 2435004, A – 40, Fluke, USA | 01 |
|  | Current Shunt 50 m.Amp  S.#: 2610014, A – 40, Fluke, USA | 01 |
|  | Current Shunt 100 m.Amp  S.#: 2675008, A – 40, Fluke, USA | 01 |
|  | Current Shunt 200 m.Amp  S.#: 26720006, A - 40, Fluke, USA | 01 |
|  | Current Shunt 300 m.Amp  S.#: 2530010, A - 40, Fluke, USA | 01 |
|  | Current Shunt 500 m.Amp  S.#: 2605012, A – 40, Fluke, USA | 01 |
|  | Current Shunt 1 Amp  S.#: 2680007, A – 40, Fluke, USA | 01 |
|  | Current Shunt 2 Amp  S.#: 2680006, A – 40, Fluke, USA | 01 |
|  | Current Shunt 3 Amp  S.#: 2525013, A – 40, Fluke, USA | 01 |
|  | Current Shunt 5 Amp  S.#: 2665000 A – 40, Fluke, USA | 01 |
|  | Current Shunt 10 Amp  S.#: 2665090, A – 40, Fluke, USA | 01 |
|  | Cambridge Ammeter 10 x 100 mA  S.#: 385101, CIC, England | 01 |
|  | Cambridge AC/DC Voltmeter 150 V  S.#: SWL – 1, CIC, England | 01 |
|  | Range Calibrator  S.#: 1719-A-1741, 11683-A, hP | 01 |
|  | Analog AC/DC Watt Meter  Polyac – 778, France | 01 |
|  | Universal LCR Bridge  TF – 2700, Marconi | 01 |

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|  | Programmable Factoring Counter Timer  8150-Digitech | 01 |
|  | Kelvin Wheatstone Bridge  S.#: 144006, 2620 | 01 |
|  | Universal Bridge  B – 221 | 01 |
|  | Micro Wave Counter  TR – 7211 | 01 |
|  | Electric Load (Self Made)  Local | 01 |
|  | DC High Voltage Power Supply  S.#: 3085010  410-B, Fluke | 01 |
|  | Precision Pico Amp / Tera Ohm Meter  DIPATO – 3, Germany | 01 |
|  | Universal Bridge B – 28 – D, AIOP | 01 |
|  | High Voltage Capacitance & Inductance Bridge  S.#: 02619, 9910 – A, Guildline | 01 |
|  | High Voltage Measuring Resistance  5573 – A, H-Tinselly | 01 |
|  | Thermostatic Oil Bath  PROLABO, France | 01 |
|  | Wheatstone Bridge  421 – China | 01 |
|  | Decade Resistance box  R-802, JJ, USA | 01 |
|  | DC Magnetic Hysterisis Loop Tracer  3257-YEW, Japan |  |
|  | Gause Meter  3251-YEW, Japan |  |

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|  | Digital Multimeter  S.#: 97, TA-365, Yokogawa | 01 |
|  | High Voltage Probe  80-K-40 HV, Fluke |  |
|  | Clamp Meter |  |
|  | Digital Insulation Continuity Tester (Japan)  S.#: 0474697, 4105 – A, Kyuritsu |  |
|  | Digital Insulation Tester (Taiwan)  S.#: 8935379, 1851 – IN, SEW | 01 |
|  | Digital Power Analyzer | 01 |
|  | Micro Ampere Meter | 02 |
|  | Power Factor Meter | 01 |
|  | Temperature & Humidity Recorder (China) | 01 |
|  | Phase Sequence Indicator YF-80 | 01 |
|  | Sliding Rheostat | 01 |
|  | Current Reversing Switch / Key | 02 |
|  | Auto Transformer | 01 |
|  | Standard Test Lead Kit | 01 |
|  | 50 Ohm Termination | 01 |
|  | Galvano Suspension | 01 |
|  | Termline Watt Meter  S.#: 982, 6156 – Termlain USA | 01 |
|  | Thermal  7100 – National | 01 |
|  | DC Voltage Standard  335-A, Fluke | 01 |
|  | DC Null Detector  845-AR, Fluke | 01 |
|  | Voltage Divider  720-A, Fluke | 01 |

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|  | | Lead Compensator  721-A, Fluke | 01 |
|  | Reference Voltage Divider  750-A, Fluke | 01 |
|  | | DC Voltage Calibrator  332 – D, Fluke | 01 |
|  | | Wave Form Generator  S.#: 524103 – 276, TF – 2120 | 01 |
|  | | RF Power meter  S.#: 190827 – 003, TF – 2503 | 01 |
|  | | AF Power Meter S.#: 257  2085- Farnel | 01 |
|  | | Taut Suspension Galvanometer | 01 |
|  | | Edspot Galvanometer | 01 |
|  | | DC milli Volt Meter 600 mVdc  Germany | 01 |
|  | | Analog AVO Meters | 01 |
|  | | Moving Coil Galvanometer  30 -- 0 – 30, Japan | 01 |
|  | | Decade Resistance Box  S.#: 926 – 3257, IN – 17, Heath kit | 01 |
|  | | Resistance Box 1 --- 500 Ω | 01 |
|  | | Power Analyzer  DW – 6091 | 01 |
|  | | Resistance Bridge  B-28, Heath Kit, USA | 01 |
|  | | Induction Coil USA | 01 |
|  | | Electric Relay (Magnetic Relays)  Midget, | 01 |

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|  | Power Factor Meter  R - 96 | 01 |
|  | Megger  F – 205. FEC, Japan | 01 |
|  | Digital Insulation Tester, (Megger)  3005-A, Kyuritsu, Japan | 01 |
|  | Veneer Caliper | 01 |
|  | Temperature & Humidity Recorder  (Drum Type) S.#: 01010114, China | 01 |
|  | Frequency Counter  238-0616-02 | 01 |
|  | Digital Multimeter  S.#: 000241 ,DM – 141, Farnel | 01 |
|  | Digital Multimeter  S.#: 000244, DM – 141, Farnel | 01 |
|  | Gauss Meter  YEW - 3251 | 01 |
|  | DC Magnetic Hysteresis Loop Tracer  YEW – 3257-25 | 01 |
|  | Factoring Counter  S.#: 79804873, USA | 01 |
|  | Digital Tester  S.#: 037090 | 01 |
|  | Micro Meter  0 --- 25 mm | 01 |
|  | Wheat Stone Bridge  2620 | 01 |

**Note: Equipments at Serial No.7, 9, 10, 11, 12, 13, 14, 52, 76, 78, 105, 106, 156, 160, 163, 164, 173, 191-197 and 206-216**

**are, at present, out of order**.

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| 1.1 **Name of Sub-Centre/R&D Discipline/Field: Thermal Metrology** | | |
| **S. #** | **Name of Equipment** | **Quantity** |
|  | Water Triple Point Cell | 01 |
|  | High Precision Thermostatic bath | 01 |
|  | Digital Thermometer 2572 | 01 |
|  | Temperature Comparator Thermostatic Oil Bath | 01 |
|  | Wet & Dry Hygrometer | 01 |
|  | Ultra Low Temperature Bath | 01 |
|  | Gallium Melting Point Cell | 01 |
|  | Indium Freeze Point Cell | 01 |
|  | Zinc Freeze Point Cell | 01 |
|  | Standard Platinum Resistance Thermometer | 01 |
|  | Standard Platinum Resistance Thermometer | 01 |
|  | Pt 100 with Mill Kelvin Thermometer | 01 |
|  | R-type Thermocouple Ceramic | 01 |
|  | S-type Thermocouple Ceramic | 01 |
|  | ASTM Liquid in Glass Thermometer (-38 ~ 205 0C) | 01 |
|  | SPRT (-20 ~ 661 0C) | 01 |
|  | SPRT (0 ~ 1070 0C) | 01 |
|  | SPRT (0 ~ 1070 0C) | 01 |
|  | Black Stack Digital Readout | 01 |
|  | Muffle Furnace (Make : PCSIR) | 01 |
|  | Freeze Point Furnace | 01 |

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|  | Dry Block Calibrator (Haven Autoerotic) | 01 |
|  | Gallium Cell maintenance apparatus | 01 |
|  | Calibration Bath (-5 0C ~ 110 0C) | 01 |
|  | Calibration Bath (-80 0C ~ 100 0C) | 01 |
|  | RH Generator Humilab | 01 |
|  | Zero Point Dry Well | 01 |
|  | Dry Block Calibrator (Gemini 700 LRI) | 01 |
|  | Triple Point of Mercury Cell | 01 |
|  | Triple Point of Mercury Cell apparatus | 01 |
|  | Metal Clad Optimal Sealed ITS-90 fixed Point Aluminum Cell | 01 |
|  | Metal Clad Optimal Sealed ITS-90 fixed Point Silver fixed point cell 961.78 0C | 01 |
|  | Heat Pipe Furnace | 01 |
|  | Isotech Fluidized Calibration Bath | 01 |
|  | Tin Freezing Point Cell | 01 |
|  | Quartz Copper Fixed Point Cell | 01 |
|  | Dry Block Temperature Comparator Tempcal-650 | 01 |
|  | Digital Thermometer Pt-100 NTU  (S. # 59444) |  |
|  | Digital Thermometer Pt-00 VNU |  |
|  | Digital Thermometer 2190A |  |
|  | Thermocouple Selector  (Type Y-2001) |  |
|  | Precision Dual Channel Thermometer (Model: 5150) |  |
|  | Furnace Yokogawasaiki |  |

**Note: Equipment at Serial Nos. 12 and 37 - 43 are, at present, out of order.**

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| **Sr. #** | | **Name of Major Equipment** | **Qty.** |
|
| 1.1 Name of Sub-Centre/R&D Discipline/Field: **Dimensional Metrology** | | | |
|  | Set of Gauge Block ID #GB-79 | | 79 Pcs. |
|  | Set of Gauge Block ID #GB-114 | | 112 Pcs. |
|  | Set of Gauge Block ID #GB-103 | | 103 Pcs. |
|  | Set of Gauge Block ID #GB-112 | | 112 Pcs. |
|  | Set of Gauge Block ID #GB-88 | | 88 Pcs. |
|  | Set of Gauge Block ID #GB-82 | | 82 Pcs. |
|  | Set of Gauge Block ID #GB-8(A) | | 08 Pcs. |
|  | Set of Gauge Block ID #GB-8(B) | | 08 Pcs. |
|  | Set of Gauge Block ID #GB-09 | | 09 Pcs. |
|  | Set of Gauge Block ID #GB-36 | | 36 Pcs. |
|  | Reference Std Meter ID#DS-04 | | 01 |
|  | Double Image Comparator ID#DS-05 | | 01 |
|  | Moller Wedel Interferometer ID#DS-03 | | 01 |
|  | Optical Comparator | | 01 |
|  | Length Comparator ID#DS-07 | | 01 |
|  | Universal Measuring Machine ID # UMM-I | | 01 |
|  | Length Measuring Mach ID # UMM-II | | 01 |
|  | Working Std Meter ID # DS-18 | | 01 |
|  | Digital Caliper ID # DS-08 | | 01 |
|  | Optical Polygon ID # DS-06 | | 01 |
|  | Set of Angle Gauge Block ID # AGB-15 | | 15 Pcs. |
|  | Gauge Block Comparator Militron  1240 ID # DS-09 | | 01 Unit |

**B. List of Experts (Physical Metrology Division)**

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| **S. #** | **List of Experts** | **Designation** | **Major Field** | |
| **Education** | **Field of Expertise** |
|  | Mr. Muhammad Arif | PSO | M.Sc | Physics |
|  | Engr. Kausar Aslam Pervaiz | PE | B.E | Mechanical |
|  | Mr. Nazir Ahmed | PSO | M.Sc | Physics |
|  | Mr. Farooq Ahmad Khan | SSO | M.Sc | Physics |
|  | Mr. Muhammad Kalim | SSO | B.Sc./MBA | Marketing |
|  | Mr. Muhammad Rafique | SEO | DAE | Mechanical |
|  | Mr. Waqar H. Shah | SEO | DAE | Electrical |
|  | Mr. Alauddin | SEO | B.Sc./DAE | Mechanical |
|  | Mr. Inayat Ullah | SEO | DAE | Mechanical |
|  | Mr. Athar Bashir | SEO | DAE | Refrigerator & AC |
|  | Mr. Aftab Haider Jafri | SEO | MA/DAE | Mechanical |
|  | Mr. Mukhtar Ahmad | SSO | M.Sc. | Maths |
|  | Engr. Summaira Masood Siddiqui | JE | Ph.D | Metallurgical |
|  | Mr. Abid Hussain | SO | M.Phil | Physics |

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|  | Mr. Ihteshamul Haq | SO | M.Sc | Physics |
|  | Ms. Mohsina Andleeb | SO | M.Sc | Physics |
|  | Mr. Faheem Usman | EO | DAE | Mechanical |
|  | Mr. Kamran Abbasi | SO | M.Sc. | Physics |
|  | Mr. M. Azam Farooq | EO | DAE | Automobile |
|  | Mr. Tariq Anjum | EO | DAE | Refrigerator & AC |
|  | Mr. Muhammad Yousuf | EO | DAE/MCS | Computer Science |
|  | Mr. Syed Jamil Asghar Naqvi | EO | DAE | Electrical |
|  | Mr. Muhammad Yasir | SO | M.Sc | Physics |
|  | Engr. Irfan Ullah Niazi | JE | B.E | Electronics |
|  | Engr. Danish Khan | JE | B.E | Electrical |
|  | Mr. Muhammad Asim | SO | M.Sc | Physics |
|  | Engr. Abdul Wahab Khan | JE | B.E | Electrical & Telecom |

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| **C. Services**   1. **Calibration Services are being provided to the Public and Private Clients.for the Year 2015** |