

| Commercial Testing of Major Lab Equipment USPCASE |          |                                                                          |               |
|---------------------------------------------------|----------|--------------------------------------------------------------------------|---------------|
| S No                                              | Labs     | Test Description                                                         | Revised Rates |
| 1                                                 | AEMS Lab | Scanning Electron Microscopy (SEM)                                       | 4,000.00      |
| 2                                                 |          | X-ray Diffraction (XRD)                                                  | 2,500.00      |
| 3                                                 |          | Simultaneous Thermogravimetry and Differential Thermal Analyses (TG-DTA) | 5,000.00      |
| 4                                                 |          | FTIR Spectrometer                                                        | 1,800.00      |
| 5                                                 |          | BET LP Sorption Analyzer                                                 | 7,000.00      |
| 6                                                 |          | Thermal Dilatometer                                                      | 4,000.00      |
| 7                                                 |          | Solar Simulator with IV Measurements                                     | 2,500.00      |
| 8                                                 |          | Laser Particle Size Analyzer                                             | 2,000.00      |
| 9                                                 |          | UV-Vis-NIR Spectrophotometer                                             | 3,000.00      |
| 10                                                |          | Atomic Force Microscopy (AFM)                                            | 8,000.00      |
| 11                                                |          | LCR meter                                                                | 2,000.00      |
| 12                                                |          | Hall Effect Measurement System                                           | 2,000.00      |
| 13                                                |          | Microhardness Tester                                                     | 5,000.00      |
| 14                                                |          | Electrochemical Work Station                                             | 4,000.00      |
| 15                                                |          | Electronic Load Analyzer                                                 | 3,000.00      |
| 16                                                |          | Thin film spectrometer                                                   | 2,000.00      |
| 17                                                |          | PH - meter                                                               | 1,000.00      |
| 18                                                |          | Optical microscopy                                                       | 2,000.00      |
| 19                                                |          | Raman Spectrometer                                                       | 2,500.00      |
| 20                                                |          | *Magnetron Sputtering                                                    | 12,000.00     |
| 21                                                |          | *E-Beam Evaporation                                                      | 15,000.00     |
| 22                                                |          | *Thermal Evaporation                                                     | 6,000.00      |
| 23                                                |          | *Advanced Thermal Evaporation                                            | 10,000.00     |
| 24                                                |          | *Carbon Coating                                                          | 6,000.00      |
| 25                                                |          | *Chemical Vapor Deposition                                               | 12,000.00     |
| 26                                                |          | Spin Coating                                                             | 1,000.00      |
| 27                                                |          | Dip Coating                                                              | 2,000.00      |
| 28                                                |          | Electro Spinner                                                          | 5,000.00      |
| 29                                                |          | Electrophoretic                                                          | 2,000.00      |

|    |                        |                                               |           |
|----|------------------------|-----------------------------------------------|-----------|
| 30 |                        | Ultrasonic Spray                              | 3,000.00  |
| 31 |                        | Ball Milling / Roll Milling                   | 4,000.00  |
| 32 |                        | Grinding and Polishing                        | 5,000.00  |
| 33 |                        | Hydraulic Press                               | 1,500.00  |
| 34 |                        | Plasma cleaning                               | 2,000.00  |
| 35 |                        | Centrifuge                                    | 2,000.00  |
| 36 |                        | Salt Spray                                    | 10,000.00 |
| 37 |                        | Spray Dryer                                   | 5,000.00  |
| 38 |                        | **Tube Furnace                                | 8,000.00  |
| 39 |                        | Muffle Furnace                                | 5,000.00  |
| 40 | Thermal Spray Facility | Sand Blasting                                 | 2,000.00  |
| 41 |                        | **Atmospheric Plasma Spray                    | 7,000.00  |
| 42 |                        | **High Velocity oxy Fuel Spray                | 7,000.00  |
| 43 |                        | **Powder Combustion Spray                     | 7,000.00  |
| 44 |                        | **Wire arc spray                              | 7,000.00  |
| 45 | Biofuel Lab            | High Performance Liquid Chromatography        | 7,500.00  |
| 46 |                        | Polymerase Chain Reaction (PCR)               | 6,500.00  |
| 47 |                        | Total Organic & Inorganic Carbon Analyzer     | 12,000.00 |
| 48 |                        | Flash Point Tester                            | 1,500.00  |
| 49 |                        | Gas Chromatography                            | 6,000.00  |
| 50 |                        | Soxhlet Extractor                             | 3,500.00  |
| 51 |                        | Rotatry Evaporator                            | 3,500.00  |
| 52 | Smart Grid Lab         | Protection Relay Development System           | 10,000.00 |
| 53 |                        | Power Measurement System                      | 3,000.00  |
| 54 |                        | NI Phasor Measurement Unit Development System | 6,000.00  |
| 55 |                        | FPGA Based Rapid Control Prototyping          | 4,000.00  |
| 56 |                        | Transient & Frequency Measurement Setup       | 5,000.00  |
| 57 |                        | Power Quality Analyzer                        | 6,000.00  |
| 58 |                        | Programmable Electronic Load, High Voltage    | 10,000.00 |
| 59 |                        | Smart Grid Automation along with SCADA & DCS  | 5,000.00  |
| 60 |                        | Environmental Chamber                         | 5,000.00  |
| 61 |                        | Battery Simulator                             | 4,500.00  |
| 62 |                        | High Voltage Probs                            | 3,000.00  |
| 63 |                        | Differential Probs                            | 5,000.00  |

|    |                  |                                                   |           |
|----|------------------|---------------------------------------------------|-----------|
| 64 |                  | High Voltage Power Supply                         | 1,000.00  |
| 65 |                  | D-Space                                           | 8,000.00  |
| 66 |                  | Power Amplifier                                   | 10,000.00 |
| 67 | Energy Storage   | Electrochemical Work Station                      | 4,000.00  |
| 68 |                  | High Pressure Gas Sorption Analyzer               | 15,000.00 |
| 69 |                  | Four Probe                                        | 600.00    |
| 70 |                  | Coin Cell Fabrication                             | 6,000.00  |
| 71 |                  | Battery Testing System                            | 4,000.00  |
| 72 | Fossil Fuel Lab  | CHN-S Elemental Analyzer                          | 7,500.00  |
| 73 |                  | Ash Fusion                                        | 7,500.00  |
| 74 |                  | Reactor / Pyrolyzer                               | 14,000.00 |
| 75 | Solar Energy Lab | QES Response Measurement System                   | 8,000.00  |
| 76 |                  | Photoluminescence Spectroscopy                    | 6,000.00  |
| 77 |                  | Indoor IV Tester for PV                           | 3,000.00  |
| 78 |                  | Spin Coating in the glovebox (3-hour session)     | 2,000.00  |
| 79 |                  | Spin Coating (3-hour session)                     | 1,000.00  |
| 80 |                  | Contact Angle Measuring System                    | 2,000.00  |
| 81 | Thermal Lab      | Gas Chromatography Mass Spectrometry              | 12,000.00 |
| 82 |                  | High Speed Camera                                 | 4,000.00  |
| 83 |                  | Bomb Calorimeter                                  | 5,000.00  |
| 84 |                  | Viscometer                                        | 3,000.00  |
| 85 |                  | Combined Smoke & Gas Emission Analyzer            | 2,500.00  |
| 86 |                  | Thermal Imaging Camera                            | 1,500.00  |
| 87 |                  | Ultra-sonicator                                   | 1,000.00  |
| 88 |                  | Multipurpose Water DO/Ph/ Electrical Conductivity | 650.00    |
| 89 |                  | Particle Image Velocimetry                        | 15,000.00 |
| 90 |                  | Computer Controlled Combustion Test Facility      | 4,500.00  |
| 91 |                  | Fuel Atomization Facility                         | 2,500.00  |
| 92 |                  | Ultrasonic Thickness Gauge                        | 1,000.00  |
| 93 |                  | Thermal Conductivity Tester                       | 10,000.00 |
| 94 |                  | Differential Scanning Calorimetry                 | 12,000.00 |
| 95 |                  | PV Module Visual Inspection                       | 1,000.00  |
| 96 |                  | Maximum Power determination                       | 7,000.00  |
| 97 |                  | Insulation Test                                   | 7,000.00  |

|     |                   |                                                  |           |
|-----|-------------------|--------------------------------------------------|-----------|
| 98  | Technology Centre | Measurement of temperature Coefficient           | 6,000.00  |
| 99  |                   | Measurement of NMOT                              | 21,000.00 |
| 100 |                   | Performance at STC and NMOT                      | 8,000.00  |
| 101 |                   | Performance at Low Irradiance                    | 9,000.00  |
| 102 |                   | Outdoor Exposure Test                            | 26,000.00 |
| 103 |                   | Hot-Spot Endurance Test                          | 30,000.00 |
| 104 |                   | Wet Leakage Current Test                         | 8,000.00  |
| 105 |                   | Static Mechanical Load Test                      | 15,000.00 |
| 106 |                   | Hail Impact Test                                 | 32,000.00 |
| 107 |                   | Stabalization                                    | 31,000.00 |
| 108 |                   | Electroluminescence Imaging Test                 | 4,000.00  |
| 109 | HV Lab            | 0<Cable Size<50 mm2                              | 8,000.00  |
| 110 |                   | 50<Cable Size<100 mm2                            | 11,000.00 |
| 111 |                   | Above 100 mm2                                    | 16,000.00 |
| 112 |                   | 0<Cable Size<50 mm2                              | 11,000.00 |
| 113 |                   | 50<Cable Size<100 mm2                            | 16,000.00 |
| 114 |                   | Above 100 mm2                                    | 24,000.00 |
| 115 |                   | 0<Cable Size<50 mm2                              | 14,500.00 |
| 116 |                   | 50<Cable Size<100 mm2                            | 21,000.00 |
| 117 |                   | Above 100 mm2                                    | 31,000.00 |
| 118 |                   | 11 kV Insulator string                           | 9,500.00  |
| 119 |                   | AC voltage withstand test for transformer (Up to | 14,500.00 |
| 120 |                   | AC voltage withstand test for transformer (Up to | 16,000.00 |
| 121 |                   | DC voltage withstand test for transformer (Up to | 17,500.00 |
| 122 |                   | DC voltage withstand test for transformer (Up to | 21,000.00 |
| 123 |                   | AC flashover voltage test for transformer (Up to | 16,000.00 |
| 124 |                   | AC flashover voltage test for transformer (Up to | 17,500.00 |
| 125 |                   | DC flashover voltage test for transformer (Up to | 19,000.00 |
| 126 |                   | DC flashover voltage test for transformer (Up to | 22,500.00 |
| 127 |                   | Transformer Panel                                | 48,000.00 |
| 128 |                   | Bus Couple Panel                                 | 75,000.00 |
| 129 |                   | HT Panel                                         | 75,000.00 |
| 130 |                   | Bulk Material Panel                              | 75,000.00 |
| 131 |                   | Motor (up to 25 kW)                              | 32,000.00 |

|     |                                  |           |
|-----|----------------------------------|-----------|
| 132 | Energy Meter (Single Phase)      | 24,000.00 |
| 133 | Energy Meter (Three Phase)       | 96,000.00 |
| 134 | Termination Kit                  | 22,500.00 |
| 135 | Circuit Breaker (0-60 A)         | 8,000.00  |
| 136 | Earth Tester                     | 9,500.00  |
| 137 | CT & PT                          | 10,000.00 |
| 138 | Silicon Sheet / Insulating Paper | 5,000.00  |
| 139 | Insulating liquid Tester         | 9,000.00  |

\*An additional amount of 3000/- to 10000/- will be charged in case the applicant does not provide source / target material

\*\*An additional amount of 5000/- to 15000/- will be charged in case the applicant does not provide Powder, Gas, Wire

Payment should be made via Bank Draft / Pay order on behalf of Beneficiary "CES RECURRING FUND" OR for online use below information.

Title of Account: NUST CES

Account Number: **22927000563601**

Bank Name: Habib Bank Limited (HBL) Pakistan Branch Code: 2292

NUST Branch H-12, Islamabad NUST FTN/NTN **90137043**

For Contact:

AEMS Lab - 05190855279 & 05190855361

Thermal Spray Facility 05190855278

Thermal Energy Lab 05190855291

Smart Grid Lab 05190855292

Fossil Fuel Lab 05190855254

Bio Fuel Lab 0519085359

Technology Center 051-90855362

Energy Conversion Lab 05190855341

Energy Storage Lab 05190855290