Office of the Dean Research and Development
Indian Institute of Engineering Science & Technology (IIEST), Shibpur
Howrah-711 103

Project Code: DRC/DST-WOS/CEGESS/SM/006/16-17

Centre of Excellence for Green Energy & Sensor Systems
Indian Institute of Engineering Science & Technology (IIEST), Shibpur
Howrah-711 103

Ref.: Tender Advt. No. CGE 1331, dated 24.01.2018

<u>Notice Inviting Quotations</u>

Sealed quotations are invited for the supply of

Item 1. IV Meter.

Item 2. Accessories for MFC & IVM along with Digital Multimeter (Handheld).

Item 3. IV measurement software along with PC Interface for MFC & IVM.

as per the following technical specification. The technical specification can be downloaded from the website. The document can be also obtained from the Centre of Excellence for Green Energy & Sensor Systems (contact: Dr. Sanhita Majumdar) between 10.00 a.m. and 6.00 p.m. on all working days. The invitation is valid for 7 working days from the date of publication of this notice.

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(A. Code DRC-T113/17-18)

SECTION I: <u>TERMS & CONDITIONS</u>

1. The last date of receipt of quotation is valid **for 7 working days** from the date of publication of this notice**.** Quotations received later will not be entertained under any circumstances.

2. Potential supplier are to submit the quotations in Sealed Cover to the Centre of Excellence for Green Energy & Sensor Systems in the following address:

   Dr. Sanhita Majumdar
   CEGESS
   IIEST, Shibpur
   Howrah-711103, India

3. Item name must be mentioned on cover.

4. The price quoted should be inclusive of all Taxes in INR, duties and levies. Inclusion of Tax/Levy at a latter stage will not be accepted. Freight, Insurance charges should be clearly indicated. If GST is chargeable then price quoted should be inclusive of GST in INR.

5. Vendor should have proven track record of supply in IIEST, IIT, NIT, IISc.

6. Commercial Papers duly signed & must be attached.

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SECTION II: <u>TECHNICAL SPECIFICATIONS</u> :-

<h2>Item 1.   IV Meter</h2>

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Instrument Should Have Following Features :

- **Integrated voltage/current 4-quadrant precision source and measurement capabilities for easy and accurate I/V measurement**
- **Wide coverage up to 210 V, 3 A DC/10.5 A pulse**
- **The 4.3″ front panel color display supports both graphical and numerical view modes**
- **High resolution arbitrary waveform generation (AWG) and list sweep**
- **functions (10 µs minimum interval)**
- **High speed digitizing capability (maximum 100000 points/s sample rate)**
- **IVI-COM drivers, and SCPI supporting conventional SMU command set for basic compatibility**
- **LXI class C, USB2.0, GPIB, LAN and digital I/O interface**
- **The Instrument should have the facility for remote operation through LAN**

Detail Technical Specification :

- **No of Channel**   **: 1**
- **Source Voltage**   **: ± 200 mV – ± 210 V**
- **Min Resolution**   **: 1 µV (min.)**
- **Source Current**   **: ± 100nA – ± 3.03 A**
- **Current Pulsed Output**   **: ± 10.5 A**
- **Pulse width at DC or Pulse output**   **: 50 µs to 99999.9 s**
- **Pulse width programming resolution**   **: 1 µs**
- **Minimum programmable pulse width**   **: 50 µs**
- **Max. Digit at Source**   **: 5 ½ Digit**
- **Voltage Measurement**   **: ± 200 mV - ± 200 V**
- **Resolution**   **: 100 nV (min.)**
- **Current Measurement**   **: ± 10 nA – ± 10 A**
- **Resolution**   **: ± 100 fA**
- **Max. Digit at Measurement**   **: 6 ½ Digit**
- **Min programmable interval for List**   **: 20 µs**

sweep/ AWG waveform

- **Max output power and source/sink limits**   **: 31.8 W ±6 V @ ±3.03 A, ±21 V @ ±1.515 A, ±210 V @ ±105 mA, four quadrant source or sink operation**
- **View mode**   **: Single view, Dual view, Graph view and Roll view**
- **Sweep Measurement**   **: No of Steps - 1 to 2,500 , Linear ,log, list**
- **Sweep Direction**   **: Single , Double. Type : DC or Pulse**
- **Max buffer size**   **: 100,000 points / channel**
- **Warranty**   **: 1 year minimum.**

Item 2.
Tech. Spec. for Accessories for MFC & IVM along with Digital Multimeter (Handheld) :

Key Features & Specifications :

- **Maximum voltage: 42 V**
- **Termination: 5 single banana plugs (4-wire measurements plus ground)**
- **Length: cable is 0.8 meters (31.5 inches)**

It should consists of two gold-plated flat tweezers with special gripping surfaces
It should be compatible with IV Meter , Benchtop Multimeters.
USB/GPIB Interface Cable should also be supplied for PC Interface.

Detailed Specifications for DMM :-

Technical Specifications of HandHeld Digital Multimeter:
- **It should have 10,000 count display.**
- **0.09% basic DC voltage accuracy and true RMS measurement**
- **Basic functions: DCV, DCI, ACV, ACI, resistance, frequency, continuity, diode test**
- **Advanced functions: capacitance, temperature, switch counter**
- **Adjustable backlighting with Min/Max Recording.**
- **CAT III 1000V and CAT IV 600V over voltage protection**
- **Certified to CE and CSA**
- **Compatible with IR-Bluetooth adapter/cable for remote monitoring &datalogging**
- **DC Voltage range : 1000mV to 1000 V**
- **DC Current : 1000 microAmp to 10 Amperes**
- **Resistance : 1000 ohms to 100 Meg Ohms**
- **Diode test range : 1 V , Resolution : 0.001 V ,Test current: 0.5 mA, Accuracy : 0.3%**
- **AC Voltage Range : 1000mV to 1000V**
- **AC Current : 1000 microAmpere to 10 Ampere**
- **Temperature : Thermocouple K type (–40 to 1000 °C/–48 to 1832 °F) , Resolution : 0.1 °C /0.1 °F , Accuracy : 1% + 1 °C/1% + 1.8 °F**
- **Capacitance : 1000 nF to 10 mF (Resolution : 0.1 nF to 0.001mF)**
- **Frequency : 100 Hz to 1000 kHz**
- **Measuring rate Function Times/second : ACV 7 , DCV (V or mV) 7 , Ω 14 , Diode 14 , Capacitance 4 (< 100 µF) , DCA (µA, mA, A) 7 , ACA (µA, mA, A) 7 , Temperature 7 (single) , Frequency 1 (> 10 Hz)**
- **Display : Dual display (secondary display is intended for temperature function display only) consists of 4-digit liquid crystal display (LCD) with maximum reading of 11,000 counts. Automatic polarity indication.**
- **Common Mode Rejection Ratio : > 90 dB at DC, 50/60 Hz ± 0.1% (1 kΩ unbalanced)**
- **Normal Mode Rejection Ratio : > 60 dB at 50/60 Hz ± 0.1%**
- **It should be able to communicate with PC with compatible software for datalogging.**
- **Warranty : 1 year minimum.**

Item 3.

Tech. Spec. for IV measurement software along with PC Interface for MFC & IVM :

Detailed Specifications :-

- **The software should support measurement upto 4 channels.**
- **It should be able to perform Sweep Measurement along with Source & Sampling Measurement**
- **The measurement data should be available in Table View as well as Graph View**
- **The Graph View should have the following functionalities :-**
  Two markers on any data points.
  Axis inversion capability.
  Reference Lines to compare the data on the graph.
  Detail setting for all the color setting, graph and axis title, and line type can be made.
- **The software should be able to export the data in excel as per following:**
  Export as CSV file
  Export to Excel worksheet (manually)
  Export to Excel worksheet (automatically)
- **The software should be interfaced with the IVM in either of the following ways or preferably all the following ways :**
  LAN (b) USB (c) GPIB
- **The software should be able to perform IV, v-t, and i-t measurements.**
- **The software should support Secondary Sweep facility.**
- **The software should have the option to select / or input no. of sweep steps, triggering and no. of sample points.**
- **It should support the following sweep modes :-**
  (a)Liner Single(b) Linear double(c)Log Single(d)Log double(e)List.
- **Trigger Mode should be either of the following :- (a) Auto (b) Timer based.**
- **Display format should be in both (a)Scientific & (b) Engineering form.**

  PC specification (Laptop) :-

  Laptop i5 , 5th/6th/7th Generation , 1 TB HDD , 4-8 GB RAM , Windows 10 OS, Screen/Display – 15 inch.