

Centre for Renewable Energy and Materials
Department of Chemistry Building
University of Kerala,
Kariavattom, Thiruvananthapuram-695581
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QUOTATION NOTICE

Competitive quotations are invited from reputed firms / manufactures for the supply, installation and commissioning of the following instruments / equipments as detailed below.

Tender Notification Date	: 04/03/2021
Last Date of Issuing Tender Document	: 19/03/2021
Last Date of Receiving Tender/Bid Closing	: 19/03/2021, 4.00 pm
Date and Time of Opening Tender	: 20/03/2021, 3.00 pm

Documents to be submitted: Data sheet of the items and Compliance statement, Details of warranty, Address and details of the firm, financial bid and any other relevant information.

Item No: 32

Ref. No. CREM/Eq/PUR/32/2021

Equipment Name: Four probe Measurement system

Quantity: 1 No.

Technical Specifications

- Chuck 6” dia Teflon
- Probing resolution 1 micron
- Probing pin spacing 40 mil
- Probe pin radius 40.6 micron
- Four Probe Arrangement with suitable connectors for current source and voltage source
- Should include current source and voltage meter
- Should include accessories of test bench and shielding box

Item No: 33

Ref. No. CREM/Eq/PUR/33/2021

Equipment Name: Digital Storage Oscilloscope

Quantity: 3 No.

Technical Specifications

- Bandwidth up to 200 MHz
- Analog Channels – 2
- Sampling rate – 1GS/s
- 7-inch WVGA color display
- PC and integrated software
- Warranty- 5 years

Item No: 34

Ref. No. CREM/Eq/PUR/34/2021

Equipment Name: Hand Held Multimeter

Quantity: 5 No.

Technical Specifications

- Display : LCD Display
- Counts : 6000
- AC Voltage Range : 600mV to 600 V
- AC Voltage Accuracy : $\pm 1.0\%+3$
- DC Voltage Range : 600 mV-600 V
- Warranty 5 years

Item No: 35

Ref. No. CREM/Eq/PUR/35/2021

Equipment Name: Photo Colorimeter

Quantity: 5 No.

Technical Specifications

- Display : 3 digit

- Filter : 8
- Wavelength Range : 400 -700 nm
- Warranty : 3 years
- Accessories : 5 test tubes, Test tube stands, Power cable etc

Item No: 36

Ref. No. CREM/Eq/PUR/36/2021

Equipment Name: All-in-one Solar cell Tester

Quantity: 1No.

Technical Specifications

- Light source, SMU, multiplexer, concentrator, spectral synthesis, sample holder, switcher/shun-burner
- Working area 16 x 16 mm²
- Custom sample holder
- Manual touch screen operation and free software for PC control
- Operates from a single phase 110-240VAC 50/60Hz power supply
- Fully CE-approved and compliant
- Turn-key system

Item No: 37

Ref. No. CREM/Eq/PUR/37/2021

Equipment Name: All-in-one Solar cell Tester

Quantity: 1No.

Technical Specifications

- Light source, SMU, multiplexer, concentrator, spectral synthesis, sample holder, switcher/shun-burner
- Working area 16 x 16 mm²
- Custom sample holder
- Manual touch screen operation and free software for PC control
- Operates from a single phase 110-240VAC 50/60Hz power supply
- Fully CE-approved and compliant
- Turn-key system

Item No: 38

Ref. No. CREM/Eq/PUR/38/2021

Equipment Name: Solar Simulator

Quantity: 1No.

Technical Specifications

- ISOSun cabinet with all controls and electrical lead
- Integrated digital thermometer
- Integrated digital light intensity meter
- Fan cooling of test chamber
- Standard filter
- Light bulb

Item No: 39

Ref. No. CREM/Eq/PUR/39/2021

Equipment Name: Solar cell lifetime and stability tester

Quantity: 1No.

Technical Specifications

- Dark tests (ISOS-D-1, ISOS-D-2 and ISOS-D-3)
- Laboratory weathering (ISOS-L-2 and ISOS-L-3)
- Outdoor (ISOS-O-2 and ISOS-O-3)
- Thermal cycling (ISOS-T-2)

Item No: 40

Ref. No. CREM/Eq/PUR/40/2021

Equipment Name: Solar radiation meter

Quantity: 3 No.

Technical Specifications

- Spectral Range: 360 to 1120 nm
- Operating Environment: 0 to 50 C

- Calibration Uncertainty: $\pm 5\%$
- Measurement Repeatability: $< 1\%$
- Response Time: $< 1\text{ ms}$
- Field of View: 180°
- Type: Pyranometer Meter

Item No: 41

Ref. No. CREM/Eq/PUR/41/2021

Equipment Name: Potentiostat galvanostat

Quantity: 1 No.

Technical Specifications

- Multi-channel electrochemical workstation
- Range up to 1 MHz,
- Current range from 1 A down to $10\ \mu\text{A}$,
- Software control
- Standard Test cell-3 sets
- Standard electrode- 3 sets
- Data acquisition control and transfer system

Item No: 42

Ref. No. CREM/Eq/PUR/42/2021

Equipment Name: Ion selective electrode meter and electrodes

Quantity: 1 No.

Technical Specifications

- ISE meter resolution: 3 digits 0.01; 0.1; 1; 10 concentration
- ISE meter accuracy: $\pm 0.5\%$ of reading (monovalent ions), $\pm 1\%$ of reading (divalent ions)
- Temperature Range: -20.0 to 120.0°C
- Copper ISE with measurement range 0.0006 to 6,400 mg/l
- Lead ISE with measurement range 0.2 to 20,000 mg/l

Item No: 43

Ref. No. CREM/Eq/PUR/43/2021

Equipment Name: LCR meter

Quantity: 1 No.

Technical Specifications

- Inductance range: 20 μ H, 200 μ H, 2000.0 μ H, 20.0000mH, 200.00mH with basic accuracy of $\pm(0.5\%rdg + 5 \text{ digits})$, and 2000.0H, 20.000H, 200.00H, 2000.0H with basic accuracy of (DF <0.1).
- Capacitance range: 20pF, 200pF, 2000pF, 20.000nF, 200.00nF, 2000.0nF with basic accuracy of $\pm(0.5\%rdg + 5 \text{ digits})$, and 20.000 μ F, 200.00 μ F, 2.0000mF, 20.00mF with basic accuracy of (DF <0.1).
- Resistance range: 20.00 Ω , 200.00 Ω , 2.0000k Ω , 20.000k Ω , 200.00k Ω , 2.0000M Ω , 20.000M Ω , 200.0M Ω with basic accuracy of $\pm(0.5\%rdg + 5 \text{ digits})$.
- Q : 0.000 to 1999
- Phase: $\pm 90^\circ$

Item No: 44

Ref. No. CREM/Eq/PUR/44/2021

Equipment Name: Digital Vernier calliper and micrometre combo

Quantity: 1 No.

Technical Specifications

- Vernier calliper with Resolution: 0.01mm or .0005"/0.01mm
- Repeatability: 0.01mm / .0005"
- Display: LCD
- Micrometer with resolution: 0.001mm or 0.00005
- LC: 0.001 mm
- Range: 0-25 mm
- Accuracy: 0.001

Item No: 45

Ref. No. CREM/Eq/PUR/45/2021

Equipment Name: DC power source

Quantity: 1 No.

Technical Specifications

- 0-40V/0-180A
- Line regulation Voltage 0.5% and Current 0.5%
- Load regulation Voltage 0.5% and Current 0.5%
- Meter accuracy Voltage 0.2% ± 3 counts and Current 0.2% ± 3 counts
- Output noise (90-20MHz)

Item No: 46

Ref. No. CREM/Eq/PUR/46/2021

Equipment Name: Programmable DC power source

Quantity: 1 No.

Technical Specifications

- 0 to 35 V/2.2 A or better
- Load and Line Regulation \pm (% of output + offset)
- Voltage $< 0.01\% + 3$ mV
- Current $< 0.01\% + 250$ μ A
- Normal Mode Voltage < 5 mVpp/0.5 mVrms or better
- Normal Mode Current < 4 mArms Common Mode Current < 1.5 μ Arms
- Programming Voltage $< 0.05\% + 10$ mV
- Current $< 0.2\% + 10$ mA
- Transient Response Less than 50 μ sec for output to recover to within 15 mV following a change in output current from full load to half load or vice versa.
- Settling Time < 90 msec
- Capability for generating sine, triangle, square, saw tooth waves

Item No: 47

Ref. No. CREM/Eq/PUR/47/2021

Equipment Name: Pedal operated metal shear

Quantity: 1 No.

Technical Specifications

- Max Shear Width: 300mm

Item No: 48

Ref. No. CREM/Eq/PUR/48/2021

Equipment Name: Polypropylene pump

Quantity: 1 No.

Technical Specifications

- Pressure 50psi
- LPM 60

Item No: 49

Ref. No. CREM/Eq/PUR/49/2021

Equipment Name: Polypropylene pump

Quantity: 1 No.

Technical Specifications

- Pressure 46psi
- LPM 60

Item No: 50

Ref. No. CREM/Eq/PUR/50/2021

Equipment Name: Polypropylene pump

Quantity: 1 No.

Technical Specifications

- Pressure 42psi
- LPM 60

Item No: 51

Ref. No. CREM/Eq/PUR/51/2021

Equipment Name: Battery cycler

Quantity: 1 No.

Technical Specifications

- Multichannel (>5 channels) battery cycler
- Current output ranges: 0.5mA-100mA; 100mA-3A; 3A-6A
- Voltage output range: 10mV-5V
- Minimum discharge voltage: -2V
- Accuracy: 0.05% or better
- Data record frequency: up to 10Hz or better
- Compatible for testing coin cells and pouch cells
- Minimum onsite warranty for two years

Item No: 52

Ref. No. CREM/Eq/PUR/52/2021

Equipment Name: Conductivity meter

Quantity: 1 No.

Technical Specifications

- Digital electrical conductivity meter with conductivity probe having internal temperature sensor
- Electrical conductivity range: 0 to 1999 $\mu\text{S}/\text{cm}$, 0.0 to 199.9 mS/cm , 0.0 to 199.9 $\mu\text{S}/\text{cm}$, 0.00 to 19.99 mS/cm
- Electrical conductivity resolution 0.1 $\mu\text{S}/\text{cm}$, 1 $\mu\text{S}/\text{cm}$, 0.01 mS/cm , 0.1 mS/cm
- Accuracy of $\pm 1\%$ FS or better
- Automatic temperature compensation (in an environment of 0 to 50°C or better)
- Built-in probe holder and solution holders
- Minimum one year warranty

Item No: 53

Ref. No. CREM/Eq/PUR/53/2021

Equipment Name: Coin cell crimper machine

Quantity: 1 No.

Technical Specifications

- Hydraulic crimping machine
- Working pressure 80-100 kg/cm²

Item No: 54

Ref. No. CREM/Eq/PUR/54/2021

Equipment Name: Film coater machine (for battery electrode coating)

Quantity: 1 No.

Technical Specifications

- Coating Speed: 0-100 mm/s
- Film Width: >100 mm
- Coating thickness of applicator: 0.01~3.5mm

Item No: 55

Ref. No. CREM/Eq/PUR/55/2021

Equipment Name: Ball mill machine

Quantity: 1 No.

Technical Specifications

- Ball milling tank volume: 50 ml x 4 or 100 ml x 4
- Max continuous working time: 72 hours
- Rotation speed: 0-900rpm
- Zirconia grinding balls
- Material: Wet or Dry, free flowing
- Output material size: Min 0.1um
- One year warranty

Item No: 56

Ref. No. CREM/Eq/PUR/56/2021

Equipment Name: Battery electrode sheets calendering machine (Electric roller press)

Quantity: 1 No.

Technical Specifications

- Roller diameter: 96mm
- Roller width: 100mm
- Programmable roller press with digital temperature display

Item No: 57

Ref. No. CREM/Eq/PUR/57/2021

Equipment Name: Portable mini Potentiostat with compatible electrodes

Quantity: 1 No.

Technical Specifications

- Voltage range: ± 2 V or better
- Voltage resolution: 1 mV
- Maximum current range: ± 2 mA or better
- Current measurement: 2 nA to 200 μ A or better
- Current resolution: 0.1% of the current measurement range
- Operating software and interface cables
- Compatible reference and counter electrodes with connecting cables
- Compatibility for current measurement techniques such as Linear Sweep Voltammetry, Cyclic Voltammetry, Square Wave Voltammetry, Differential Pulse Voltammetry, Amperometry and Pulsed Amperometry

Item No: 58

Ref. No. CREM/Eq/PUR/58/2021

Equipment Name: Metal cutting mitre saw

Quantity: 1 No.

Technical Specifications

- Type : Compound Slide Mitre Saw

- Saw Blade Diameter: >300mm
- Blade Speed: 1900- 3800 RPM or better
- Suitable for MS, SS, Aluminium
- Spare blades: 2 Nos

Item No: 59

Ref. No. CREM/Eq/PUR/59/2021

Equipment Name: Pump assisted filtering system for plating chemicals

Quantity: 1 No.

Technical Specifications

- Capacity: 40LPM

Item No: 60

Ref. No. CREM/Eq/PUR/60/2021

Equipment Name: Pump assisted filtering system for plating chemicals

Quantity: 1 No.

Technical Specifications

- Capacity: 50LPM

Item No: 61

Ref. No. CREM/Eq/PUR/61/2021

Equipment Name: Pump assisted filtering system for plating chemicals

Quantity: 1 No.

Technical Specifications

- Capacity: 60LPM

Tender Inviting Authority: Director, Centre for Renewable Energy and Materials, University of Kerala, Kariavattom Campus, Thiruvananthapuram, Kerala-695581.

Terms and Conditions

1. Incomplete & conditional quotations and quotations received after the due date will be summarily rejected without assigning any reasons thereof.
2. The Bidder shall quote the price in clear terms and the specification of products. The rates quoted must be inclusive of all taxes, cost of supply at the site, warranty and installation charges etc.
3. The price should be quoted only in Indian rupees. The bid shall be typed and signed by the bidder.
4. All the documents mentioned above shall be submitted without fail.
5. **Validity:** The Bid will be valid for 90 days from its date of opening. Further extension can be done by mutual consent.
6. **Delivery:** The item should be delivered at the Centre for Renewable Energy and Materials, University of Kerala, Kariavattom Campus.
7. **Installation and commissioning:** The items shall be installed and commissioned at the Centre for Renewable Energy and Materials, University of Kerala, Kariavattom Campus. All incidental expenses should be borne by the supplier.
8. **Payment:** The University will release the payment only after inspecting the equipment and satisfy that the supply is as per the requirements. The payment will be made after successful completion of the supply and producing invoice in duplicate.
9. **Warranty/Guarantee:** The supplier shall guarantee to repair/replace the items or its part – if found defective within the warranty period. The entire expenditure for repair/ replace of the item in this regard shall be borne by the supplier.

10. **Service facility:** Supplier should mention their details of service setup and manpower in Trivandrum who are responsible for after sales service.

11. In case of the dispute arises, the decision of University authority shall be final and binding on bidders.

12. The undersigned reserves the right to reject or accept any or all the tenders received fully or partly without assigning any reason thereof.

13. General rules relating to the purchase of materials/equipment will also applicable to this tender.

14. Those who are interested should send their bid in a sealed cover superscribed with **“Quotation for Ref. No: (.....) Equipment Name: (.....)”** and addressed to The Director, Centre for Renewable Energy and Materials, Department of Chemistry Building, University of Kerala, Kariavattom Campus, 695581, Thiruvananthapuram, Kerala.

15. Those firms who are interested to quote more than one instrument should sent individual quotations for each item separately.

16. The bids shall be opened at the office of the Director, Centre for Renewable Energy and Materials, University of Kerala, Kariavattom Campus on the Date mentioned above. If the above date of opening tender happens to be on a holiday or due to any other valid reason, the tender opening process will be done on the next working day or the day fixed by the undersigned.

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Hon. Director

Centre for Renewable Energy and Materials

University of Kerala