



**COMSATS University Islamabad, Lahore Campus**  
**Defence Road, Off Raiwind Road, Lahore**

Tender No. CUI-LHR-TN-13-20-1411

Case # 3111

**Single Stage Two Envelop Procedure**

**Title of Tender: Lab Equipment for Chemical Engineering Department, CUI Lahore Campus**

**TERMS AND CONDITIONS**

- All pages of bidding documents are mandatory to be signed / stamped, meaning thereby bidder agrees to our terms & conditions mentioned herein, failing which the bid may be rejected.**
- Any addition, deletion or modification of any clause of the procurement terms & conditions/ BoQs of CUI Lahore Campus by any vendor will not be acceptable and may lead to rejection of the bid.**
- Only registered Suppliers, who are on Active Taxpayers List (ATL) of FBR, are eligible to participate in tender.**
- The contract will be executed and handed over in satisfactory conditions up to the entire satisfaction of COMSATS University Islamabad, Lahore Campus.
- Documents along with Pay Order / Demand Draft amounting to **Rs. 1000/-** as a tender document fee (Non-Refundable) shall be submitted in favor of COMSATS University Islamabad, Lahore Campus to the address given below. No bid will be accepted without tender documents' fee.
- Part / Advance payments is not allowed.
- The exact completion/installation/ delivery time from the date of the purchase / work order will be 60 days. The handing over / completion time for this contract is of critical importance.**
- Your bid proposal should be inclusive of freight and all other taxes and to be delivered at COMSATS University Islamabad (CUI), Lahore Campus's premises.
- After opening of bids, CUI-Lahore Campus will examine the bids for completeness as per tender document.
- In case more than one bidder have quoted same rates for an item; the bidder securing more items (in terms of cost) will be awarded the specific item.
- Purchase order (s) will be awarded to the lowest or technically recommended bidder (s) on the basis of item wise / subtotal wise / grand total wise according to the nature of BoQs.
- The bid should be submitted in a sealed envelope up to **September 23, 2020** on or before **1400hrs** and will be opened on the same date **at 1430hrs** in the presence of available bidders. In case of any holiday is announced by the Govt. OR any unforeseeable circumstances that prevent the tender from being opened on the date announced (Force Majure Situation), the tenders will be opened on the very next working day. Timing will remain as mentioned in the tender notice.
- COMSATS University Islamabad, Lahore Campus, will follow the PPRA rule of **single stage two envelope procedure;**

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- i. The bid shall comprise a single package containing **two separate envelopes**. Each envelope shall contain separately the **financial proposal** and the **technical proposal**;
- ii. The envelopes shall be marked as **“FINANCIAL PROPOSAL”** and **“TECHNICAL PROPOSAL”** in bold and legible letters to avoid confusion;
- iii. Initially, only the envelope marked **“TECHNICAL PROPOSAL”** shall be opened;
- iv. The envelope marked as **“FINANCIAL PROPOSAL”** shall be retained in the custody of the procuring agency without being opened;
- v. The procuring agency shall evaluate the technical proposal in a manner prescribed in advance, without reference to the price and reject any proposal which does not conform to the specified requirements;
- vi. During the technical evaluation no **amendments** in the technical proposal shall be permitted;
- vii. The financial proposals of bids shall be opened publicly at a time, date and venue announced and communicated to the bidders in advance;
- viii. After the evaluation and approval of the technical proposal the procuring agency, shall at a time within the bid validity period, publicly open the financial proposals of the technically accepted bids only. The financial proposal of bids found technically nonresponsive shall be returned un-opened to the respective bidders;
- ix. and
- x. The bid found to be the lowest evaluated bid shall be accepted.

14. The envelope should be marked as under;

**Secretary, Purchase Committee**  
**COMSATS University Islamabad, Lahore Campus**  
Defence Road, Off Raiwind Road, Lahore.  
Tel: 042-111-001-007, Ext: 875

15. The envelope shall also bear the word **“CONFIDENTIAL”** and following identification quotation of **“Lab Equipment for Chemical Engineering Department, CUI Lahore Campus”**.
16. The bid form (BoQs) must be duly filled in, stamped and signed by the authorized representative of the bidder.
17. **If the vendor fails to deliver the goods / services to COMSATS University Islamabad (CUI), Lahore Campus within the given deadline, any of the following can be opted by CUI Lahore campus on the recommendation of the end user and approval of the authority;**
  - a. An extension in the delivery period may be granted in case a valid reason/justification with necessary documentary evidence is provided by the vendor supporting the reason for delay.
  - b. A penalty upto 10% of the invoice value may be charged.
  - c. Purchase order may be cancelled along with confiscation of earnest money if the vendor fails to deliver the goods / services after the initial or extended delivery time, as the case may be.
18. If the delivered goods / services are not according to the required quality standards / specifications, the same shall be liable to be rejected after inspection. The vendor would be required to supply as per requirements mentioned in our BoQs, otherwise the purchase / work order will be cancelled after due date with confiscation of earnest money.

19. Deduction of Income Tax and any other tax will be deducted at source according to Government prevailing rules.
20. Payment will be made on submission of Invoice in the name of “COMSATS University Islamabad (CUI), Lahore Campus” with a copy of delivery challan (s) after the complete order has been supplied, inspected and accepted which includes delivery / installation, and COMSATS acceptance / inspection thereof.
21. All prices should be valid for at least **120 days**. Withdrawal or any modification of the original offer within the validity period shall entitle CUI-Lahore Campus to forfeit the earnest money in favor of the CUI-Lahore Campus and / or put a ban on such vendor participation in tenders / works.
22. It is the sole responsibility of the agent / supplier / manufacturer to comply with the applicable laws, be national or international.
23. In case of any dispute or grievance, the matter shall be addressed as per PPRA rules.
24. The CUI-Lahore Campus reserves the right to modify the quantities of goods / services at any time before the award of purchase / work order.
25. **05% of the total value of the Invoice will be retained as security by COMSATS University Islamabad (CUI), Lahore Campus, and will be released after warranty period i.e. (As Mentioned in BoQs) which will be counted from the date of Installation / Completion of work / Supply.**
26. **The bidder is required to furnish in form of Bank deposit/ CDR / Pay order equivalent to 2% of the total Bid price as Earnest Money crossed in favor of “COMSATS University Islamabad, Lahore Campus”.**
27. **CUI Lahore Campus** reserves the rights to reject the bid if;
  - i. Received without earnest money
  - ii. Received later than the date and time fixed for tender submission
  - iii. The tender is unsigned/ unstamped
  - iv. The offer is ambiguous
  - v. The offer is conditional
  - vi. The offer is from a firm, which is black listed by any Govt. Office.
  - vii. The offer is received by telephone/telex/fax/telegram.
  - viii. Any unsigned / ambiguous erasing, cutting / overwriting etc. is made.
28. The bidder should furnish a certificate as worded below in token of acceptance of all the terms and conditions of the tender otherwise the tender will not be considered under any circumstances.
29. The undersigned affirm that the terms and conditions as contained in this document have been read and accepted and that in the event of selection of my/our rate the agreement in the prescribed form will be entered into:
  - **Company / Vendor Name:**.....
  - **Postal Address:**.....
  - **Tel. / Mobile:**.....**Email:**.....
  - **NTN#:**.....**GST#:**.....
  - **Signature:** .....
  - **Please also attach the Certificate supporting being Active Taxpayer as per requirement of FBR.**

**BoQs of Lab Equipment for Chemical Engineering Department, CUI Lahore Campus**

**Technical Portion (Please mention the quoted model/ brand in technical portion with no mention of price otherwise the bid will be rejected)**

No change in the BoQs (Specs & Qty.) of CUI-Lahore Campus, as detailed below, is allowed. Any additional information may be mentioned in the blank columns (i.e. model / brand or Price). Any modification in CUI-Lahore Campus BoQ may lead to rejection of bid (fully or partially).			Qty	Please mention the quoted Model / Brand with meeting the all specifications mentioned in BoQs
Sr. #	Item Name & Specifications			
01	<p><b><u>PC based UV-VIS Spectrophotometer</u></b>            Specifications:            1. Photometric system: Double beam optics            2. Monochromator: Czerny-Turner mounting, Blazed Holographic grating            3. Detector: Photomultiplier            4. Light source: Tungsten and Deuterium lamp with automatic switching            5. Measurement range: 185 to 1100 nm            6. Wavelength accuracy: <math>\pm 0.1</math> nm at 656.1 nm D2 or better            7. Wavelength scanning speed: Up to 4000nm/min or better            8. Wavelength repeatability: <math>\pm 0.05</math> nm or better            9. Spectral bandwidth: Selectable from 0.1 nm to 5 nm or better            10. Resolution: 0.1 nm or better            11. Stray light: 0.005% at 220 nm, 340 nm &amp; 370 nm or lesser            12. Photometric modes: Absorbance (abs), Transmittance, Reflectance, Energy,            13. Photometric range: Absorbance: up to 5 Abs or better, Transmittance, Reflectance 0 to 99.9% or better            14. Photometric accuracy: <math>\pm 0.002</math> Abs or better            15. Photometric repeatability: <math>\pm 0.001</math> Abs or better            16. Baseline flatness: <math>\pm 0.0008</math> Abs or lesser            17. Noise level: 0.00003 Abs RMS (500 nm) or better            Quartz Cuvette: ~2.5 ml capacity 10 mm path length or better            Film Holder (Optional): Capable to hold films, and other thin samples for measurement            Power Requirements: 100 to 240VAC, 50/60Hz            Mode: Energy, Absorption, Transmission,            Power Backup: Online UPS            for Above system Windows based Operating software should have built in features. Desktop computer with latest configuration and is being capable to run equipment software for data processing. Laser Printer should also be included.            Usage and printed literature manual from manufacturer should be provided            One Year Warranty.            Including Installation &amp; Commissioning complete with all aspects</p>	1	No.	

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02	<p><b><u>φ150mm Integrating sphere Accessory for item # 1</u></b>          Designed for diffuse reflectance measurement of a solid sample surface and absorbance measurement of a turbid sample. With an aperture ratio as small as 2 %, this unit is usable for high-accuracy colorimetric measurement.          Specifications          Wavelength range: 350 to 750 nm          100 %T line flatness: ±0.5 %T          Aperture ratio: 2 %          Light trap: Mountable</p>	1	No.	
03	<p><b><u>Flow Cell accessory for item # 1</u></b>          Specifications          Cell Capacity: 600ul or better          Optical path length: 5 mm (quartz flow cell used)          Connection tubing: Teflon tube of outside diameter 4 mm and inside diameter 3 mm          Reference beam side: 5 mm rectangular cell (standard accessory)</p>	1	No.	
04	<p><b><u>Micro Flow Cell accessory for item # 1</u></b>          Specifications          Cell Capacity: 70ul or better          Optical path length: 10 mm (quartz flow cell used)          Connection tubing: Teflon tube of outside diameter 2 mm and inside diameter 1 mm          Reference beam side: 10 mm rectangular cell (standard accessory)</p>	1	No.	
<b>Purchase Order will be issued on Sub Total Basis (For Sr. # 1 to 4)</b>				
05	<p><b><u>Airtight Quartz Cuvettes</u></b>          Airtight Quartz Cuvette: ~2.5 ml capacity 10 mm path length or better</p>	2	Nos.	
06	<p><b><u>Computer Controlled Automatic Potentiometric Titrator</u></b></p> <ol style="list-style-type: none"> <li>1. Principle of operation : Volume determination by equivalence point and end point.</li> <li>2. Instrument details : Microprocessor controlled titration unit (vortex type) and control unit and shall also comprise the following:             <ol style="list-style-type: none"> <li>a. 10 ml burette with tubing, connector &amp; Teflon coated valve</li> <li>b. Temperature sensor</li> <li>c. Moisture filter</li> <li>d. Glass dispensing tip</li> <li>e. 150 ml. Glass beaker.</li> <li>f. Stand for mounting all above items</li> <li>g. Electrode for aqueous titration – pH combination</li> </ol> </li> <li>3. Accessories :              Each automatic titrator shall be accompanied with the following accessories:             <ul style="list-style-type: none"> <li>➤ Electrode pH glass body combination</li> </ul> </li> </ol>	1	No.	

	<ul style="list-style-type: none"> <li>➤ Electrode for argentimetric / precipitation titration – silver pin combination</li> <li>➤ Electrode for redox titration – Platinum pin combination</li> <li>➤ Electrode for complexometric titration – silver pin combination glass with amalgamation.</li> </ul> <p>4. Combined functionality : Offered auto titrator must have functionality for determination of pH and for performing non aqueous titration, redox titration, argentimetric / precipitation titration, complexometric titration and silver assay.</p> <p>5. mV range : <math>\pm 3000</math> mV or higher</p> <p>6. Accuracy : <math>\pm 0.10</math> mV or better</p> <p>7. Polarized sensor range: 0 to <math>\pm 3200</math> mV</p> <p>8. Polarized sensor resolution : 0.10 mV or better</p> <p>9. Burette resolution: 1<math>\mu</math>L</p> <p>10. Titration head: Manual stand with swiveling arm</p> <p>11. Stirrer System : Microcontroller based vortex stirrer/Magnetic Stirrer with digital indication to achieve variable speed and high torque</p> <p>12. End point detection: Potentiometric and voltametric</p> <p>13. Cut-off criteria: Volume, pH/mV and endpoint</p> <p>14. Special features:</p> <ul style="list-style-type: none"> <li>➤ Auto titrator should perform fast, reliable, and reproducible automated titrations.</li> <li>➤ Auto burette recognition</li> <li>➤ It should have a mode for performing automated calibrations program and save at least 100 user defined methods with password protection.</li> <li>➤ It should provide flexible pH, non-aqueous, redox, and ion concentration titrations. The unit should also have feature of equivalence point titrations, preset pH or mV endpoint titrations.</li> <li>➤ Auto titrator should have minimized downtime with easily replaceable burettes, tubing, and dispensers.</li> <li>➤ Auto titrator should have a feature to leave unattended in running condition until titration is completed.</li> <li>➤ Provision to connect electrode with BNC connector and also for differential electrode.</li> </ul> <p>15. Memory : Auto titrator should have memory to store at least 100 titration data sets with date/time stamp, transferable to printer, computer, or USB drive.</p> <p>16. Display : 7” touch screen display.</p> <p>17. Display features : The display should clearly show online graph of titration trend and also the status of burette filling &amp; dispensing.</p> <p>18. Ports : Serial port for balance connection and USB port for other peripherals.</p> <p>19. Report format : The auto titrator should generate following reports:</p> <ul style="list-style-type: none"> <li>➤ Parameters and results</li> </ul>		
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	<ul style="list-style-type: none"> <li>➤ Data table for mV, pH, mV/ml, 2nd derivative and volume (μL)</li> <li>➤ Graphical report for mV v/s μL titration curve.</li> <li>➤ Graphical report for 1st derivative graph v/s μL titration curve</li> <li>➤ Graphical report for 2nd derivative.</li> <li>➤ Report of method parameters for at least 50 methods.</li> </ul> <p>20. Data : The system shall have following features</p> <ul style="list-style-type: none"> <li>➤ Data entry to the auto titrator, viz., name, titrant name and other tags shall have time stamp to comply GLP &amp; GMP norms</li> <li>➤ Provision for data backup</li> <li>➤ Provision to generate reports in PDF format.</li> <li>➤ Built in 21 CFR compliant software with multi level password for access control and audit trails.</li> </ul> <p>21. Documents : IQ / OQ Documents &amp; Operating Manual  Warranty: 12 Months from the date of installation with vendor having good local reputation with running machines and well trained engineers  Training: 2-persons advanced training (Operations, Trouble Shooting etc.) on site. Training Schedule must be attached with the quotation</p>			
<p>07</p>	<p><b><u>Digital Hotplate and magnetic stirrer</u></b>  Circular-top LCD Digital Hotplate Stirrer (340°C Max.)  Heat only, stir only or heat and stir together functions, High-resolution LCD display shows actual temperatures and speed  Digital speed control with max. speed up to 1500rpm  External temperature control is possible by connecting the optional temperature sensor(PT-1000) with accuracy at ±0.2°C  Max. stirring quantity of H2O at 20L  RS232 function provides PC control and data transmission (free software must be available)  The “HOT” warning will flash if the plate temperature is above 50°C even when the hotplate is turned off  Automatic spin bar retrieval  Low temperature stability  Microprocessor temperature control  Stainless steel work plate with ceramic coating provides excellent chemical-resistance  Electronic speed control for constant speed even during changes in load  Brushless DC motor is maintenance free  High magnetic adhesion  Free software for control data logging by PC  2 Year Warranty  Make: SCIOLOGEX or equivalent  One Year Warranty  Installation and commissioning with all aspects</p>	<p>1</p>	<p>No.</p>	

08	<p><b><u>Digital Refractometer</u></b>  Refractive Index range: 1.3300-1.5080 with +/- 0.0005 accuracy  Brix range: 0-85% with +/- 0.2% accuracy  Simple one-button calibration  Automatic Temperature Compensation (ATC) and No Temperature Compensation Settings (NoTC)  One-point calibration: Calibrate with distilled or deionized water  Small sample size: Sample size can be as small as 2 metric drops (100 µl)  Automatic Temperature Compensation (ATC): Automatically compensates for temperature variations  Quick, accurate results: Readings are displayed in approximately 1.5 seconds  Upgraded Dual-level LCD: The large LCD screen displays nD20, nD or % Brix and temperature readings simultaneously  Stainless steel sample well: Easy to clean and corrosion-resistant. Battery indicators: Battery percent level remaining at startup and low battery indicator  Automatic shut-off: Conserves battery life by shutting off automatically after three minutes of inactivity  IP65 water resistant protection: Water resistant ABS plastic casing designed to perform under laboratory and field conditions.  Make: Hanna HI96800 or equivalent  One Year Warranty  Installation and commissioning with all aspects</p>	1	No.	
09	<p><b><u>Chiller for process fluid condensation</u></b>  Temp. Range -5°C~ 35°C  Temp. Stability ±0.3°C  Temp. Control Mode  PID  Cooling Capacity 500W  Reservoir Volume 1.8 L  Heat Exchanged Mode  BOARD  Power Supply 230V, 50Hz  One Year Warranty  Installation and commissioning with all aspects</p>	1	No.	

### **Bid Evaluation Criteria**

All bids shall be evaluated in accordance with the following evaluation criteria and other terms & conditions set forth in this bidding document.

- a. The bids shall be evaluated to strictly ensure that the quoted brand/ model meet all the BoQ/ specification requirements given in the tender document for each item.
- b. In addition to the BoQ requirements, vendors must meet the vendor qualification criteria /company profile requirements (if any), as set forth in this tender document.

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- c. Supporting literature of the quoted model must be attached for verification & technical evaluation of the required specification by the technical committee. In case of any clash is found between the quoted model and the supported literature may lead to rejection of bid.

**Financial Portion (Price and Brand/Model to be mention only in Financial Proposal in a separate sealed envelope) Strictly on our BoQs Form.**

Vendors are required to provide both unit and total price of each item and calculations must be made carefully to avoid mistakes. However, in case, total price does not match with the unit price and quantity due to calculation error or typo error, any of the following can be opted

1. The bid may be rejected on the reason of ambiguity (OR)
2. Unit price will be considered as final and total price of the respective item will be calculated by multiplying it with the quantity required. Sub-totals and grand total will also be corrected accordingly.

No change in the BoQs (Specs & Qty.) of CUI-Lahore Campus, as detailed below, is allowed. Any additional information may be mentioned in the blank columns (i.e. model / brand or Price). Any modification in CUI-Lahore Campus BoQ may lead to rejection of bid (fully or partially).

Prices should be quoted inclusive of all applicable taxes

Sr. #	Item Name & Specifications	Qty		Quoted Model / Brand / Make	Unit Price (Rs)	Total Price (Rs)
01	<p><b><u>PC based UV-VIS Spectrophotometer</u></b>            Specifications:            1. Photometric system: Double beam optics            2. Monochromator: Czerny-Turner mounting, Blazed Holographic grating            3. Detector: Photomultiplier            4. Light source: Tungsten and Deuterium lamp with automatic switching            5. Measurement range: 185 to 1100 nm            6. Wavelength accuracy: <math>\pm 0.1</math> nm at 656.1 nm D2 or better            7. Wavelength scanning speed: Up to 4000nm/min or better            8. Wavelength repeatability: <math>\pm 0.05</math> nm or better            9. Spectral bandwidth: Selectable from 0.1 nm to 5 nm or better            10. Resolution: 0.1 nm or better            11. Stray light: 0.005% at 220 nm, 340 nm &amp; 370 nm or lesser            12. Photometric modes: Absorbance (abs), Transmittance, Reflectance, Energy,            13. Photometric range: Absorbance: up to 5 Abs or better, Transmittance, Reflectance 0 to 99.9% or better            14. Photometric accuracy: <math>\pm 0.002</math> Abs or better            15. Photometric repeatability: <math>\pm 0.001</math> Abs or better            16. Baseline flatness: <math>\pm 0.0008</math> Abs or lesser            17. Noise level: 0.00003 Abs RMS (500 nm) or better</p>	1	No.			

**Signature & Stamp of Bidder**

	<p>Quartz Cuvette: ~2.5 ml capacity 10 mm path length or better</p> <p>Film Holder (Optional): Capable to hold films, and other thin samples for measurement</p> <p>Power Requirements: 100 to 240VAC, 50/60Hz</p> <p>Mode: Energy, Absorption, Transmission,</p> <p>Power Backup: Online UPS</p> <p>for Above system Windows based Operating software should have built in features. Desktop computer with latest configuration and is being capable to run equipment software for data processing. Laser Printer should also be included. Usage and printed literature manual from manufacturer should be provided</p> <p>One Year Warranty.</p> <p>Including Installation &amp; Commissioning complete with all aspects</p>					
02	<p><b><u>ø150mm Integrating sphere Accessory for item # 1</u></b></p> <p>Designed for diffuse reflectance measurement of a solid sample surface and absorbance measurement of a turbid sample. With an aperture ratio as small as 2 %, this unit is usable for high-accuracy colorimetric measurement.</p> <p>Specifications</p> <p>Wavelength range: 350 to 750 nm</p> <p>100 %T line flatness: ±0.5 %T</p> <p>Aperture ratio: 2 %</p> <p>Light trap: Mountable</p>	1	No.			
03	<p><b><u>Flow Cell accessory for item # 1</u></b></p> <p>Specifications</p> <p>Cell Capacity: 600ul or better</p> <p>Optical path length: 5 mm (quartz flow cell used)</p> <p>Connection tubing: Teflon tube of outside diameter 4 mm and inside diameter 3 mm</p> <p>Reference beam side: 5 mm rectangular cell (standard accessory)</p>	1	No.			
04	<p><b><u>Micro Flow Cell accessory for item # 1</u></b></p> <p>Specifications</p> <p>Cell Capacity: 70ul or better</p> <p>Optical path length: 10 mm (quartz flow cell used)</p> <p>Connection tubing: Teflon tube of outside diameter 2 mm and inside diameter 1 mm</p> <p>Reference beam side: 10 mm rectangular cell (standard accessory)</p>	1	No.			
<b>Sub Total Amount (Rs.) Inclusive of all Taxes</b>						
05	<p><b><u>Airtight Quartz Cuvettes</u></b></p> <p>Airtight Quartz Cuvette: ~2.5 ml capacity 10 mm path length or better</p>	2	Nos.			

**Signature & Stamp of Bidder**

06	<p><b><u>Computer Controlled Automatic Potentiometric Titrator</u></b></p> <p>22. Principle of operation : Volume determination by equivalence point and end point.</p> <p>23. Instrument details : Microprocessor controlled titration unit (vortex type) and control unit and shall also comprise the following:</p> <ol style="list-style-type: none"> <li>a. 10 ml burette with tubing, connector &amp; Teflon coated valve</li> <li>b. Temperature sensor</li> <li>c. Moisture filter</li> <li>d. Glass dispensing tip</li> <li>e. 150 ml. Glass beaker.</li> <li>f. Stand for mounting all above items</li> <li>g. Electrode for aqueous titration – pH combination</li> </ol> <p>24. Accessories : Each automatic titrator shall be accompanied with the following accessories:</p> <ul style="list-style-type: none"> <li>➤ Electrode pH glass body combination</li> <li>➤ Electrode for argentimetric / precipitation titration – silver pin combination</li> <li>➤ Electrode for redox titration – Platinum pin combination</li> <li>➤ Electrode for complexometric titration – silver pin combination glass with amalgamation.</li> </ul> <p>25. Combined functionality : Offered auto titrator must have functionality for determination of pH and for performing non aqueous titration, redox titration, argentimetric / precipitation titration, complexometric titration and silver assay.</p> <p>26. mV range : <math>\pm 3000</math> mV or higher</p> <p>27. Accuracy : <math>\pm 0.10</math> mV or better</p> <p>28. Polarized sensor range: 0 to <math>\pm 3200</math> mV</p> <p>29. Polarized sensor resolution : 0.10 mV or better</p> <p>30. Burette resolution: 1<math>\mu</math>L</p> <p>31. Titration head: Manual stand with swiveling arm</p> <p>32. Stirrer System : Microcontroller based vortex stirrer/Magnetic Stirrer with digital indication to achieve variable speed and high torque</p> <p>33. End point detection: Potentiometric and voltametric</p> <p>34. Cut-off criteria: Volume, pH/mV and endpoint</p>	1	No.			
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**Signature & Stamp of Bidder**

<p>35. Special features:</p> <ul style="list-style-type: none"> <li>➤ Auto titrator should perform fast, reliable, and reproducible automated titrations.</li> <li>➤ Auto burette recognition</li> <li>➤ It should have a mode for performing automated calibrations program and save at least 100 user defined methods with password protection.</li> <li>➤ It should provide flexible pH, non-aqueous, redox, and ion concentration titrations. The unit should also have feature of equivalence point titrations, preset pH or mV endpoint titrations.</li> <li>➤ Auto titrator should have minimized downtime with easily replaceable burettes, tubing, and dispensers.</li> <li>➤ Auto titrator should have a feature to leave unattended in running condition until titration is completed.</li> <li>➤ Provision to connect electrode with BNC connector and also for differential electrode.</li> </ul> <p>36. Memory : Auto titrator should have memory to store at least 100 titration data sets with date/time stamp, transferable to printer, computer, or USB drive.</p> <p>37. Display : 7" touch screen display.</p> <p>38. Display features : The display should clearly show online graph of titration trend and also the status of burette filling &amp; dispensing.</p> <p>39. Ports : Serial port for balance connection and USB port for other peripherals.</p> <p>40. Report format : The auto titrator should generate following reports:</p> <ul style="list-style-type: none"> <li>➤ Parameters and results</li> <li>➤ Data table for mV, pH, mV/ml, 2nd derivative and volume (<math>\mu\text{L}</math>)</li> <li>➤ Graphical report for mV v/s <math>\mu\text{L}</math> titration curve.</li> <li>➤ Graphical report for 1st derivative graph v/s <math>\mu\text{L}</math> titration curve</li> <li>➤ Graphical report for 2nd derivative.</li> <li>➤ Report of method parameters for at least 50 methods.</li> </ul> <p>41. Data : The system shall have following features</p> <ul style="list-style-type: none"> <li>➤ Data entry to the auto titrator, viz., name, titrant name and other tags shall have time stamp to comply GLP &amp; GMP norms</li> <li>➤ Provision for data backup</li> </ul>					
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	<ul style="list-style-type: none"> <li>➤ Provision to generate reports in PDF format.</li> <li>➤ Built in 21 CFR compliant software with multi level password for access control and audit trails.</li> </ul> <p>42. Documents : IQ / OQ Documents &amp; Operating Manual Warranty: 12 Months from the date of installation with vendor having good local reputation with running machines and well trained engineers Training: 2-persons advanced training (Operations, Trouble Shooting etc.) on site. Training Schedule must be attached with the quotation</p>					
07	<p><b><u>Digital Hotplate and magnetic stirrer</u></b> Circular-top LCD Digital Hotplate Stirrer (340°C Max.) Heat only, stir only or heat and stir together functions, High-resolution LCD display shows actual temperatures and speed Digital speed control with max. speed up to 1500rpm External temperature control is possible by connecting the optional temperature sensor(PT-1000) with accuracy at <math>\pm 0.2^{\circ}\text{C}</math> Max. stirring quantity of H<sub>2</sub>O at 20L RS232 function provides PC control and data transmission (free software must be available) The “HOT” warning will flash if the plate temperature is above 50°C even when the hotplate is turned off Automatic spin bar retrieval Low temperature stability Microprocessor temperature control Stainless steel work plate with ceramic coating provides excellent chemical-resistance Electronic speed control for constant speed even during changes in load Brushless DC motor is maintenance free High magnetic adhesion Free software for control data logging by PC 2 Year Warranty Make: SCIOLOGEX or equivalent One Year Warranty Installation and commissioning with all aspects</p>	1	Nos.			
08	<p><b><u>Digital Refractometer</u></b> Refractive Index range: 1.3300-1.5080 with <math>\pm 0.0005</math> accuracy Brix range: 0-85% with <math>\pm 0.2\%</math> accuracy Simple one-button calibration Automatic Temperature Compensation (ATC) and No Temperature Compensation Settings (NoTC)</p>	1	No.			

	<p>One-point calibration: Calibrate with distilled or deionized water</p> <p>Small sample size: Sample size can be as small as 2 metric drops (100 µl), Automatic Temperature Compensation (ATC): Automatically compensates for temperature variations Quick, accurate results: Readings are displayed in approximately 1.5 seconds, Upgraded Dual-level LCD: The large LCD screen displays nD20, nD or % Brix and temperature readings simultaneously</p> <p>Stainless steel sample well: Easy to clean and corrosion-resistant. Battery indicators: Battery percent level remaining at startup and low battery indicator. Automatic shut-off: Conserves battery life by shutting off automatically after three minutes of inactivity. IP65 water resistant protection: Water resistant ABS plastic casing designed to perform under laboratory and field conditions. Make: Hanna HI96800 or equivalent</p> <p>One Year Warranty</p> <p>Installation and commissioning with all aspects</p>					
09	<p><b><u>Chiller for process fluid condensation</u></b></p> <p>Temp. Range -5°C~ 35°C</p> <p>Temp. Stability ±0.3°C</p> <p>Temp. Control Mode, PID, Cooling Capacity 500W, Reservoir Volume 1.8 L</p> <p>Heat Exchanged Mode, BOARD</p> <p>Power Supply 230V, 50Hz, One Year Warranty</p> <p>Installation and commissioning with all aspects</p>	1	No.			

**Special Terms and conditions:**

- i. Please submit the technical and financial bid (rates) on our prescribed BoQs Form and clearly mention the quoted model / brands, with complete terms and conditions signed, stamped with both bids, otherwise your bid (s) may be rejected.
- ii. Vendor will be responsible for Onsite Installation & Commissioning of the delivered equipment's.
- iii. Purchase / work order (s) will be awarded on **Sub Total Basis (from Sr. # 1 to 4) and on Item Wise basis (From Sr. # 5 to 9).**
- iv. Kindly attach the **Tender fee with Technical Bid** and **Bid money / CDR with Financial Bid.**
- v. **Multiple rates of an item may also lead to the rejection of bid / item.**