UTKAL UNIVERSITY

Vani Vihar, Bhubaneswar-751004
Odisha, India

WEB: www.utkaluniversity.nic.in

E-mail: rusa.utkal@gmail.com

TWO BID OPEN TENDER DOCUMENT

For

Procurement of Scientific Equipment / Instruments / Furniture & Fixture / Infrastructure for Central Instrumentation Facility and Centre of Excellences of Utkal University

Tender No: DRS/RUSA/(Equipment)/R2-298/2022, Dt. 29.09.2022

Last Date for submission of Tender: Dt. 21.10.2022 Time 4 PM

Date & time for opening of Tender: Dt. 25.10.2022 Time 2 PM

Tender Paper can be downloaded from

www.utkaluniversity.nic.in

UTKAL UNIVERSITY
Vani Vihar, Bhubaneswar - 751004

TENDER CALL NOTICE

No. DRS/RUSA/ (Equipment)/R2-298 /2022 Date 29/09/2022

Sealed (Two bid) tenders are invited from manufactures/authorized dealers having VAT/GST clearance, PAN/TAN certificate for supply, initialization and commissioning of different scientific instruments/ equipment for Central Instrumentation Facility (CIF) and different Centre of Excellences of Utkal University. The tender documents are available at www.utkaluniversity.nic.in from Dt. 30-09-2022 Time 10 am .The last date for submission for bidding documents/tenders is Dt. 21-10-2022 Time 4PM. The authority reserves the right to accept/negotiate/cancel/reject any or all tenders and modify the items & the conditions/specification at any stage without assigning any reason thereof. The sealed tender paper superscripted as "TENDER FOR CIF" will be received by [illegible] post during office hours on working days only. The tender will be opened on Dt. 25-10-2022- 2 PM at Central Instrumentation Facility (CIF) Building.

29/9/2022

REGISTRAR

Memo No. DRS/RUSA-..... (Equipment)/R2-299 /2022 Date 29/09/2022

Registrar
Utkal University
Vani Vihar, Bhubaneswar-4

Copy to

1. The Chairman, P.G Council, Utkal University
2. Comptroller of Finance, Utkal University
3. The Director, R&D, Utkal University
4. The PS to Vice-Chancellor, Utkal University
5. The Coordinator RUSA 2.0, Utkal University
6. The Coordinator, IDP & WB-OHEPEE, Utkal University
7. The Professor-in-charge, Computer centre, Utkal University, for uploading in the university website for information of all concern
8. M/s **DISPLAY LINE** With a request to publish the advertisement in one issue of the Times of India (All edition), the Samaj & the Sambad at the I &PR rate of government of Odisha (With the trade discount) and to submit the bill in triplicate for payment.
9. Copy of the Notice board, Utkal University for general information.
10. Notice Board, PG Council, Utkal University.
11. Notice Board, CIF, Utkal University.

For information and necessary action.

29/9/2022

REGISTRAR

Registrar
Utkal University
Vani Vihar, Bhubaneswar-4

IMPORTANT INFORMATION

1	Type of Tender	**Two Bid Open Tender System**
2	Tender no.	Tender No: DRS/RUSA/(Equipment)/R2-298/2022, Dt. 29.09.2022
3	Availability of tender paper on website: date and time	30.09.2022; 10 AM
4	Last date and time for tender submission	21.10.2022; 4 PM
5	Place of Submission (Only by Regd. Post/Speed Post/Courier)	Office, CIF Building, Utkal University, Vani Vihar, Bhubaneswar – 751004
6	Tender opening date and time	25.10.2022; 2 PM
7	Place of Opening the tender papers	Conference Hall, 1st floor, CIF Building
8	Cost of tender paper	Rs. 1,000/- as Demand Draft (DD) In favour of Comptroller of Finance, Utkal University, payable at Bhubaneswar.
9	Earnest Money Deposit (EMD)	Filled-in Declaration in lieu of EMD (Annexure- V)
10	Performance Security	Performance Security @ 3% is to be submitted by the successful bidder for the selected items or alternatively, a declaration with bank guaranty is required. (Annexure - VI)

UTKAL UNIVERSITY
Vani Vihar, Bhubaneswar-751004

TENDER PAPER

Tender No: DRS/RUSA/(Equipment)/R2-298/2022, Dt. 29.09.2022

Sealed (two bid) tenders are invited from manufacturers/ authorized dealers/ stockiest for supply of Scientific Equipment / Instruments / Furniture & Fixture / Infrastructure for Central Instrumentation Facility and Centre of Excellences of Utkal University. Details information and tender documents of the above items are available in the website of Utkal University (www.utkaluniversity.nic.in). The tender paper, complete in all respect, will be received at the Office of Central Instrumentation Facility, CIF Building, Utkal University by hand/ by registered post/speed post/courier.

The last date for submission of the tender papers 21.10.2022 time 4 PM

EMD value: Filled-in Declaration in lieu of EMD (Annexure- V) is to be submitted by the bidder.

1. **Language of the tender paper: English**
2. **Eligible Goods & Services:** All goods and related services to be supplied under the contract shall have their origin in India or any other country with which India has not banned trade relations. The term "origin" used in this clause means the place where the goods are mined, grown, produced, or manufactured or from where related services are arranged and supplied. Services to be supplied.
3. **Corrigendum:** At any time within 7days prior to the deadline for submission of Bids, the purchaser may, for any reason deemed fit by it, modify the Tender Enquiry Document by issuing suitable Corrigendum to it. Corrigendum will be notified through www.utkaluniversity.nic.in only. In order to provide reasonable time to the respective Bidders to take necessary action in preparing their Bids as per the amendment, the purchaser may, at its direction extend the deadline appropriately for the submission of Bids and other allied time frames, which are linked with that deadline.
4. **Preparation of Bids:** The Two Bid system, i.e., "Technical Bid" and "Financial Bid'' prepared by the Bidder, in two different sealed envelopes, and must be sealed within

one envelope superscripted as "**Tender for CIF**". The details for preparation of both the bids are as follows.

A. Technical Bid (Un-priced bid):

i. Filled-in **Declaration in lieu of EMD (Annexure- V)** is to be submitted by the bidder.

ii. Technical specification of quoted equipment/instruments. **Bids have to be given in the desired format (Annexure-II A) separately for each item.**

iii. All requirements like appropriate Voltage Stabilizer, Online UPS, dedicated tables, computers, and printers necessary for the functioning of the equipment/instruments, should be clearly specified and quoted in INR in the bid.

iv. Provision of electricity, water and gas, any alternation of wall electrical sockets and / or dedicated electric line up to the place of installation should clearly be stated in the bid and should be quoted in turnkey method.

v. **Technical brochure/catalogue** of OEM of quoted equipment detailing its technical parameters.

vi. Scanned copy of "**Performance statement**" along with relevant copies of order and End Users satisfaction certificate.

vii. **GST Registration Certificate**.

viii. Bidder who quoted for goods manufactured by other manufacturers should submit the manufacturer's **Authorisation Certificate**.

ix. **Declaration Certificate** as per Annexure-III

x. **Compliance and Non-compliance statement** with respect to the specifications given must be enclosed in both hard and soft copy of the bids.

xi. An **Undertaking** (as mentioned in Annexure IV) stating that the bidder is not de-registered/ banned/ blacklisted by any Central/ Odisha Governments/ Institutions need to be enclosed.

xii. Valid **DSIR Certificate** will be provided by the purchaser.

B. Financial (Price) Bid:

i. Price schedules/ Financial Bid may be prepared with all the details including Make, Model etc. of goods. **Bids have to be given in the desired format (Annexure-IIB) separately for each item.**

ii. The price should be inclusive of all taxes. Clearance and C.I.F. up to the place of installation at Central Instrumentation Facility, CIF Building (Adjacent to Law Department), Utkal University, Bhubaneswar-751004.

N.B.: The Bidder must sign and put seal on all the pages of both the bids.

5. **Bid Currency:**

The Bidder supplying indigenous goods or already imported goods shall quote only in Indian rupees (INR). For imported goods if supplied directly from abroad prices shall be quoted in any freely convertible currency, as regards prices for allied services, if any required with the goods, the same shall be quoted in Indian rupee only, if such services are be performed/ undertaken in India. Alternatively, the Bidder may quote in both foreign currency and INR.

Commission for Indian Agent, if any and if payable shall be indicated in the space provided for the price schedule and will be payable in Indian rupees only after satisfactory supply, installation and acceptance of the goods. The rate of conversion shall be taken as on the date of placement of purchase order. Bids, where price are quoted in any other way shall be treated as non-responsive and rejected.

6. **Bid Price:**

The price the items quoted in INR should be inclusive of all taxes and delivery charges up to the place of installation at Central Instrumentation Facility, CIF Building (Adjacent to Law Department), Utkal University, Bhubaneswar-751004.

If the supply is from outside India, the custom clearance is to be taken up by C & F agent engaged by the bidder and the said agent shall forward the consignment up to our Laboratory. University will support the agent with documentation only.

The cost of clearing the goods, custom charges will be borne by the University and to be quoted separately/along with the original quote.

The transport charges and forwarding of the consignment up to the place of installation at the Central Instrumentation Facility, including demurrage charge, if any, shall be borne by the Bidder. University will not be responsible for unnecessary demurrage charges by delay in handling the document for clearance by the agent.

7. **Information and Instruction on Taxes & Duties:**

GST (Goods and Services Tax) – Quoted rate should be inclusive of GST and other applicable taxes and duties.

Custom Duty – The purchaser will pay the Custom Duty wherever applicable. The Price quoted should be inclusive of Packing, Insurance and transport up to the place of installation.

The goods imported from abroad, shall be governed by the rules and regulations prescribed in the current edition of INCOTERMS-2020, published by the international Chamber of Commerce.

8. **Indian Agent:**

If a foreign Bidder has engaged an agent in India in connection with its Bid, they should indicate the complete name, address, details of the services to be rendered and the commission of the Indian agent.

9. **Alternative Models:**

The Bidder can also quote alternate models meeting the specifications of the tender document of same manufacturer with single Bid Security.

10. **Earnest Money Deposit (EMD):**

Filled-in Declaration in lieu of EMD (Annexure- V) is to be submitted by the bidder.

11. **Bid validity:**

The Bid shall remain valid for acceptance for a period of 365 days from the last date of the tender submission. Any Bid valid for a shorter period shall be treated as unresponsive and rejected.

In exceptional cases, the Bidder may be requested by the purchaser to extend the validity of their Bids.

12. **Submission of Bids:**

Both the Bids have to be given strictly in the desired format (Annexure-IIA & IIB) separately for each item.

The Bidders are required to submit hard copies along with the soft copy (in a CD/DVD format) of their Bids by India post (speed post/registered post)/ by courier to ***The Registrar, At-Office of CIF, 1st Floor, Central Instrumentation Facility Building, Utkal University, Vani Vihar, Bhubaneswar-751004, Odisha, India*** which should reach on or before the Bid submission last date and time as mentioned in Important Information (page no.3).

13. **Bid Opening:**

Bids will open as per the date and time as mentioned in the "Important Information" (page no. 3)

14. **Security & Evaluation of the Bids:**

The purchaser will examine the Bids to determine whether they are complete. All pages of both the Bids should bear seal and signature of the Bidder and devoid of any over-writing. The Bids must be neatly typed and printed without any computational error and hand-written information.

The Bidder must mention the quoted item numbers as mentioned in Annexure I, on the envelope containing the bids.

The Bids which do not meet the basic requirements are liable to be treated as non-responsive and will be rejected.

Bidders who stand de-registered/banned/blacklisted by any Central/Odisha Government/Institutions or with poor/ unsatisfactory past performance will be rejected. In this regard the bidder has to submit an undertaking as mentioned in Annexure IV.

During the evaluation, any minor informality and/or irregularity and/or non-conformity in a Bid, which has not price implication, will be conveyed to the Bidder by email asking for clarification by a specific date. Unresponsiveness or any evasive reply by the Bidder will make the bids invalid.

15. **Award of Contract:**

The purchaser reserves the right to accept in part or in full any bid or reject any or more bid(s) without assigning any reason or to cancel the Tender process and reject all bids at any time prior to award of contract, without incurring any liability, whatsoever to the affected bidder(s).

16. **Corrupt or Fraudulent Practices:**

Any corrupt or fraudulent practices for influencing the tender / procurement process are discouraged and shall declare a firm ineligible, either indefinitely or for a stated period of time.

17. **Patent Rights:**

The supplier shall, at all times, indemnify and keep indemnified the purchaser, free of cost, against all claims which may arise in respect of goods and services to be provided

by the supplier under the contract for infringement of any intellectual property rights or any other right protected by patent, registration of designs or trademarks. In the event of any such claim in respect of alleged breach of patent, registered designs, trademarks etc. being made against the purchaser, the purchaser shall notify the supplier of the same and the supplier shall, at his own expenses take care of the same for settlement without any liability to the purchaser.

18. **Country of Origin:**

All goods and services to be supplied and provided for the contract shall have the origin in India or in the countries with which the Government of India has trade relations.

The word "origin" means the place from where the goods are mined, cultivated, grown, manufactured, produced or processed or from where the services are arranged.

The country of origin may be specified in the Bids.

19. **Inspection, Testing & Quality Control:**

The purchaser and/or its nominated representative(s) will, without any extra cost to the purchaser, inspect and/or test the ordered goods and the related services to confirm their conformity to the contract specifications and other quality control details incorporated in the contract. The purchaser shall inform the supplier in advance, in writing, the purchaser's program for such inspection and, also the identity of the officials to be deputed for this purpose. "The cost towards the transportation, boarding and lodging will be borne by the purchaser and/or its nominated representative(s) for the first visit. In case the goods are rejected in the first instance and the supplier requests for re-inspection, and if same is accepted by Purchaser/Consignee, all subsequent inspections shall be at the cost of the supplier. The expense such as to and fro Economy Airfare, Local Conveyance, Boarding and Lodging of the inspection team for the inspection period will be borne by the supplier.

The Technical Specification incorporated in the contract shall specify what inspections and tests are to be carried out and, also, where and how they are to be conducted. If such inspections and tests are conducted in the premises of the supplier or its subcontractor(s), all reasonable facilities and assistance, including access to relevant drawings, design details and production data, shall be furnished by the supplier to the purchaser's inspector at no charge to the purchaser.

If during such inspections and tests the contracted goods fail to conform to the required specifications and standards, the purchaser's inspector may reject them and the supplier shall either replace the rejected goods or make all alterations necessary to meet the specifications and standards, as required, free of cost to the purchaser and re-submit the same to the purchaser's inspector for conducting the inspections and tests again.

In case the contract stipulates pre-dispatch inspection of the ordered goods at supplier's premises, the supplier shall put up the goods for such inspection to the purchaser's inspector well ahead of the contractual delivery period, so that the purchaser's inspector is able to complete the inspection within the contractual delivery period.

If the supplier tenders the goods to the purchaser's inspector for inspection at the last moment without providing reasonable time to the inspector for completing the inspection within the contractual delivery period, the inspector may carry out the inspection and complete the formality beyond the contractual delivery period at the risk and expense of the supplier. The fact that the goods have been inspected after the contractual delivery period will not have the effect of keeping the contract alive and this will be without any prejudice to the legal rights and remedies available to the purchaser under the terms and conditions of the contract.

The purchaser's contractual right to inspect, test and if necessary, reject the goods after the goods arrival at the final destination shall have no bearing of the fact that the goods have previously been inspected and cleared by purchaser inspect or during pre-dispatch inspection mentioned above.

Goods accepted by the purchaser/consignee and/or its inspector at initial inspection and in final inspection in terms of the contract shall in no way dilute purchaser's/consignee's right to reject the same later, if found deficient in terms of the warranty clause of the contract, as incorporated under GCC Clause15.

Principal/ Foreign supplier shall also have the equipment inspected by recognized/ reputed agency nominated by the Purchaser prior to dispatch at the supplier's cost and furnish necessary certificate from the said agency in support of their claim

On rejection, the supplier shall remove such stores within 14 days of the date of intimation of such rejection from the consignee's premises. If such goods are not removed by the supplier within the period mentioned above, the purchaser/consignee

may remove the rejected stores and either return the same to the supplier at his risk and cost by such mode of transport as purchaser/consignee may decide or dispose of such goods at the suppliers risk to recover any expense incurred in connection with such disposals and also the cost of the rejected stores if already paid for.

20. **Terms of Delivery:**

Goods shall be delivered by the supplier in accordance with the terms of delivery and as per the delivery period specified in the schedule of requirement. Please note that the time shall be the essence of the contract.

21. **Transportation of Goods:**

Instructions for transportation of imported goods offered from abroad: The supplier shall not arrange part-shipments without the express/prior written consent of the purchaser. The supplier is required under the contract to deliver the goods under CIP (Named port of destination) terms.

22. **Insurance:**

The supplier shall make arrangement for insuring the goods during transit against loss or damage, up to the place of installation at CIF building, Utkal University.

If the equipment is not commissioned and handed over to the consignee within 3 months, the insurance will have to be extended by the supplier at their cost till the successful installation, testing, commissioning and handing over of the goods to the consignee. In case the delay in the installation and commissioning is due to handing over of the site to the supplier by the consignee/End User, such extensions of the insurance will still be done by the supplier, but the insurance extension charges at actuals will be reimbursed.

23. **Spare Parts:**

If specified in the list of requirements and in the resultant contract, the supplier shall supply/provide any or all of the following materials, information etc. for 10 years from the date of purchase, pertaining to spare parts manufactured and/or supplied by the supplier:

(a) The spare parts as selected by the Purchaser/End User to be purchased from the supplier, subject to the condition that such purchase of the spare parts shall not relieve the supplier of any contractual obligation including warranty obligations; and

(b) In case the production of the spare parts is discontinued:

Sufficient advance notice to the Purchaser/End User before such discontinuation to provide adequate time to the purchaser to purchase the required spare parts etc., and

Immediately following such discontinuation, providing the Purchaser/End User, free of cost, the designs, drawings, layouts and specifications of the spare parts, as and if requested by the Purchaser/End-user.

Supplier shall carry sufficient inventories to assure ex-stock supply of consumables and spares for the goods so that the same are used during warranty and CAMC period.

24. **Incidental Services:**

The supplier shall be required to perform the following services:

i) Installation and Commissioning, Supervision, Demonstration, Trial run etc. of the goods.

ii) Turnkey work (if any).

iii) Training of Consignee's/End Users, Staff, operators etc. for operating and maintaining the goods.

iv) Supplying required number of operation & maintenance manual for the goods.

25. **Distribution of Dispatch Documents for Clearance/Receipt of Goods:**

The supplier shall send all the relevant dispatch documents well in time to enable the purchaser clear or receive (as the case may be) the goods in terms of the contract.

Within 24 hours of dispatch, the supplier shall notify the concerned Officer of CIF, Utkal University and others concerned the complete details of dispatch and also supply following documents by air mail / courier etc. with intimation by e-mail:

a) Commercial Supplier's Invoice giving full details of the goods including quantity, value, etc.

b) Packing list

c) Certificate of country of origin

d) Bill of Lading/Airway Bill

e) Insurance Certificate (if applicable)

f) Manufacturer's guarantee and Inspection certificate (if applicable)

g) Inspection certificate issued by the Purchaser's Inspector (if applicable)

h) Any other document(s) as and if required in terms of the contract

27. **Warranty & CAMC:**

The supplier warrants comprehensively that the goods supplied under the contract is new, unused and incorporate all recent improvements in design and materials unless prescribed otherwise by the purchaser in the contract. The supplier further warrants that the goods supplied under the contract shall have no defect arising from design, materials (except when the design adopted and / or the material used are as per the Purchaser's/Consignee's specifications) or workmanship or from any act or omission of the supplier, that may develop under normal use of the supplied goods under the conditions prevailing in India.

The warranty shall include all spares, labour and preventive maintenance from the date of completion of the satisfactory installation and acceptance till warranty period.

The bidder should also mention the numbers of workshops to be hosted during the period of warranty.

All software updates for functioning of equipment/instruments should be free of cost during the warranty period.

The Comprehensive Annual Maintenance Contract (CAMC) shall include all spares, labour and preventive maintenance from the date of completion of the satisfactory installation and acceptance till warranty period.

Warranty as well as CAMC will be inclusive of all accessories and turnkey work and it will also cover the following, wherever applicable:

a) All kinds of Motors

b) Plastic and Glass Parts against any manufacturing defects

c) All kinds of sensors

d) All kinds of coils, probes and transducers

e) Printers and imagers including laser and thermal printers with all parts

f) UPS including the replacement of batteries

g) Air-conditioners

In case of any claim arising out of this warranty and CAMC period the Purchaser/Consignee shall promptly notify the same in writing to the supplier.

Upon receipt of such notice, the supplier shall, within 8 hours on a 24(hrs) X 7 (days) X 365 (days) basis respond to take action to repair or replace the defective goods or parts thereof, free of cost, at the ultimate destination. The supplier shall take over the replaced parts/goods after providing the replacements and no claim, whatsoever shall lie on the purchaser for such replaced parts/goods thereafter. The penalty clause for non-rectification will be applicable as per conditions laid down in the Tender Enquiry Document.

In the event of any rectification of a defect or replacement of any defective goods during the warranty period, the warranty for the rectified/replaced goods shall be up to the completion of the original warranty period of the main equipment.

If the supplier, having been notified, fails to respond to take action to repair or replace the defect(s) within 8 hours on a 24(hrs) X 7 (days) X 365 (days) basis, the purchaser may proceed to take such remedial action(s) as deemed fit by the purchaser, at the risk and expense of the supplier and without prejudice to other contractual rights and remedies, which the purchaser may have against the supplier.

During Warranty and CAMC period, the supplier is required to visit at each consignee's site at least once in 6 months commencing from the date of the installation for preventive maintenance of the goods

The supplier along with its Manufacturer, Indian Agent and the CAMC provider shall ensure continued supply of the spare parts for the machines and equipment supplied by them to the purchaser for 10 years from the date of installation and handing over.

The Supplier along with its Manufacturer, Indian Agent and the CAMC Provider shall always accord most favoured client status to the Purchaser vis-à-vis its other Clients/Purchasers of its equipment/machines/goods etc. and shall always give the most competitive price for its machines/equipment supplied to the Purchaser/Consignee.

28. **Taxes & Duties:**

In case of any modification or alterations in the taxes/duties, the tax prevailing at the time supply of the goods will be considered as the tax schedule. However, the supplier has to inform the intenders if there is any hike in taxes/duties.

29. **Terms & Mode of Payment:**

Payment shall be made through electronic transfer in NEFT/RTGS subject to recoveries, if any, by way of liquidated damages or any other charges as per terms and conditions of contract in the following manner:

A. Payment for Indigenous Goods (M&E) Or Foreign Origin Located within India

Payment would be made against "Installation and Acceptance Certificate" of goods to be issued by the End User subject to recoveries, if any, either on account of non-rectification of defects/deficiencies not attended by the Supplier or otherwise. "Installation and Acceptance Certificate" need to be issued by the concerned End User after installation, commissioning, testing and successful trail run (if applicable).

B. Payment for Imported Goods (M&E): Payment for foreign currency portion shall be made in the currency as specified in the contract in the following manner:

a) The net FCA/CIP price (i.e. FCA/CIP price less Indian Agency commission) of the goods dispatched by Sea/Air shall be paid through irrevocable, non-transferable Letter of Credit (LC) opened in favour of the supplier in a bank in his country or through wire transfer and upon submission of documents specified hereunder:

(i) Commercial Supplier's Invoice giving full details of the goods including quantity, value, etc.

(ii) Packing list

(iii) Certificate of country of origin

(iv) Negotiable clean Bill of Lading/Airway Bill

(v) Insurance Certificate; (if applicable)

(vi) Manufacturer's guarantee and Inspection certificate (if applicable)

(vii) Inspection certificate issued by the Purchaser's Inspector (if applicable)

(viii) Any other document(s) as and if required in terms of the contract.

b) All Incidental Costs, if applicable will be borne by the supplier.

D. Payment for Annual Comprehensive Maintenance Contract (CMC) Charges: The consignee will enter into CMC with the supplier at the rates as stipulated in the contract. The payment of CMC will be made on six monthly basis after satisfactory completion of said period, duly certified by the End User on receipt of bank guarantee for an amount equivalent to two (2) per cent of the cost of the equipment

as per contract in the prescribed format given in Section XV of the Tender document valid till 3 months after expiry of entire CMC period. The Performance Bank Guarantee for CMC will be applicable in case of contract value is more than `10 lakhs.

Terms of payment for imported goods

a) The supplier shall not claim any interest on payments under the contract.

b) Where there is a statutory requirement for tax deduction at source, such deduction towards income tax and other tax as applicable will be made from the bills payable to the Supplier at rates as notified from time to time.

c) Irrevocable & non – transferable LC shall be opened by the Purchaser. However, if the supplier requests specifically to open confirmed LC, the extra charges would be borne by the supplier. If LC is required to be extended and/or amended for reasons not attributable to the purchaser, the charges thereof shall be borne by the supplier.

d) The payment shall be made in the currency / currencies authorized in the contract.

e) The supplier shall send its claim for payment in writing, when contractually due, along with relevant documents etc., duly signed with date.

f) While claiming payment, the supplier is also to certify in the bill that the payment being claimed is strictly in terms of the contract and all the obligations on the part of the supplier for claiming that, payment has been fulfilled as required under the contract.

g) While claiming reimbursement of duties, taxes etc. (like GST, Custom Duty etc.) from the Purchaser, as and if permitted under the contract, the supplier shall also certify that, in case it gets any refund out of such taxes and duties from the concerned authorities at a later date, the supplier shall refund to the Purchaser forthwith.

30. **Delivery of the Goods:**

The time and date of delivery of the goods stipulated in the schedule shall be deemed to be of the essence of the contract and the delivery must be completed not later than the date (s) as specified in the contract. Any unexcused delay by the supplier shall render

sanctions like, imposition of liquidated damages, forfeiture of its Performance Security and/or Termination of the Contract for default.

The supplier shall not dispatch the goods after expiry of the delivery period. The supplier is required to apply to the Purchaser for extension of delivery period and obtain the same before dispatch. In case the supplier dispatches the goods without obtaining an extension, it would be doing so at its own risk and no claim for payment for such supply and/or any other expense related to such supply shall lie against the purchaser.

The installation of the delivered equipment/instruments must be completed within 20 days of the delivery of the goods at the designated site.

For all sophisticated equipment/Instruments, the supplier has to give three consecutive demonstrations for the benefit of the Institution. All chemicals and reagents required for complete demonstration of the equipment should be along with the instrument or should be along with the technical person at the time of installation.

31. **Negotiation Clause:**

The negotiations will be held at the date and address decided by the Purchaser with the bidder / bidder's representative(s) who must have written power of attorney to negotiate and sign a Contract on behalf of the Seller. The purchaser shall prepare minutes of negotiations that are signed by the purchaser and the bidder / bidder's authorized representative(s).

Annexure I

List of Scientific Equipment / Instruments / Furniture & Fixture / Infrastructure

Item code	Name of the Item
1	LC-MS MS (HRMS) Liquid Chromatography Mass Spectrometer
2	FTIR Spectrometer (FT-IR) with ATR
3	Confocal Microscope with live cell imaging facility
4	Solar Simulator
5	Particle size ZETA Potential Analyser
6	Ultrapure Water Purification System
7	Lyophilizer / Freeze Dryer
8	Cryomicrotome
9	Differential Global Positioning - Post Processing and RTK System by Radio & 4G LTE with Work Station (DGPS)
10	Flow Cytometer System
11	Microvolume Spectrophotometer
12	Research Petrological Microscope with imaging facility
13	Impedence Analyser
14	Protein Purification System
15	Ice Flaking Machine
16	Autoclave
17	High Temperature Muffle Furnace
18	Desktop Computer & Printer cum Scanner A. Desktop computer i5 B. Desktop computer i7 C. Laserjet printer – cum – scanner D. Inkjet Printer (All in One)
19	Camera & Accessories A. Camera 1 (Full Frame Mirror less sensor) B. Camera 2 C. Camera Lenses D. Camera Accessories E. Video Camera and accessories
20	Dehumidifier
21	Digital Balance
22	UV Visible Spectrophotometer with DRS
23	Rotary evaporator with vacuum pump and chiller
24	Online UPS
25	Portable Sound System
26	Air Conditioner, Stabilizer & Refrigerator A. Air conditioner (1.5 ton split type) B. Stabilizer for 1.5 ton split AC C. Refrigerator D. Drinking Water Purifier
27	Smoke and fire alarm system

28	CCTV Facility
29	Laboratory Furniture & Fixture A. Laboratory Partition B. Laboratory stool C. Laboratory table for Centrifuge D. Laboratory table Multi-purpose E. Laboratory Work Bench (Wall-side Table) F. Wall Cabinet G. Ladder H. Heavy Duty Platform Trolley
30	Inverter
31	Office Furniture & Accessories A. Office Table B. Side Table for Office C. Executive Chair Low back D. Executive Chair High back E. S type Chair with armrest F. Visitor Chair G. Steel Almirah Storewell H. Slotted Angle Rack I. Reception Table
32	-20° Deep Freezer (Vertical)
33	45 KVA D.G. Set with MCP/AMF Control Panel
34	Incubator
35	Dual block PCR machine
36	Hot Air Oven-thermostatic
37	Refrigerated Centrifuge
38	Orbital Incubator cum Shaker
39	Table top centrifuge (non-cooling)
40	Micro centrifuge
41	Van Veen Grab
42	Sieve Shaker
43	Hot & cold Bath
44	Stereo Zoom Microscope
45	Schlenk Line
46	Cryogenic Liquid Nitrogen Container
47	Rotary Vacuum Pump
48	Fume Hood
49	SECS
50	High Performance Computational Facility
51	Bacteriological Incubator
52	Cyclomixer
53	Magnetic Stirrer with Hot Plate
54	Micro-Homogenizer
55	Plant Growth Chamber

56	Multiparameter water quality Sonde/Probe
57	Ultrasonicator Bath
58	DC/RF Magnetron Sputtering system
59	Scanning Tunneling Microscope
60	Two station Planetary Ball Milling Machine
61	Real time quantitative PCR
62	Two-dimensional (2d) Electrophoresis with Image analysis
63	Western Blotting system with power pack

Annexure II (A)

Format for submitting Technical Bid (In Company's Letter head)

Item code _____ (as per Annexure I)

Name of the Item: _____

Tender No: ……. **Date: ……**

To,
The Registrar
Utkal University, Bhubaneswar-751004

Sub: Quotation for ……

Sl. no.	Technical Specification
Alternative Model (if any)	

Seal & Signature

Date:……..

Annexure II (B)

Format for submitting Price Bid (In Company's Letter head)

Item code - _____ (as per Annexure I)

Name of the Item: _____

Tender No: …….. **Date: ……**

To,
The Registrar
Utkal University, Bhubaneswar-751004

Sub: Price Bid of the Quotation for ……

Sl. no.	Technical Specification	Unit Price + Tax FOR Destination
Alternative Model (if any)		

Seal & Signature

Date:……..

Annexure III

(In Company's Letter head)

Declaration

Dated:_____

On behalf of our firm/company, we hereby declared that we will quote same discount (i.e., as per price quoted for the CIF, Utkal University), if other Departments within the Utkal University, Vani Vihar invite sealed tender for procurement of consumable items /equipment and other accessories etc. during the financial year 2022-2023. Otherwise, our participation in this tender process will be cancelled for the same financial year.

We further declare that, if our quoted item found suitable to be ordered for CIF, the same can also be procured by other Departments/CoEs of Utkal University at the same quoted price.

Seal & Signature

Date:……..

Annexure IV

(In Company's Letter head)

Undertaking regarding Blacklisting & Non-Debarment

Dated:_____

We M/s _____
hereby confirm and declare that we are not blacklisted/ De-registered/ debarred by any Government department/Public Sector Undertaking/ Private Sector/ or any other agency for which we have Executed/ Undertaken the works/ Services during the last 5 years.

Seal & Signature

Date:……..

Annexure V

(In Company's Letter head)

Declaration in lieu of EMD

I/We …….. (Insert Name and Address of Bidder) am/are submitting this declaration in lieu of Earnest Money Deposit for the Tender for …….. (Insert Title of the Tender) (Tender No……..), thereby fully accepting that I/We will be suspended and shall not be eligible to participate in the Tenders invited by Utkal University, for a period of Two years from the date of such Suspension Orders, under the following circumstances:-

a) If after the opening of Tender, I/We withdraw or modify my/our Tender during the period of validity specified in the Bid Documents (including extended validity, if any) or do not accept the correction of the Tender Price pursuant to any arithmetical errors.

b) If after the award of work, I/We fail to furnish the required Performance Security or sign the Contract, within the time limits specified in the Departmental Tender Document.

Seal & Signature

Date:……..

Annexure VI

Bank Guarantee for Performance Security

To,

The Registrar, Utkal University

WHEREAS ..... (name and address of the supplier) (hereinafter called "the supplier") has undertaken, in pursuance of contract no ..... dated ..... to supply ..... (Description of goods and services) (hereinafter called "the contract").

AND WHEREAS it has been stipulated by you in the said contract that the supplier shall furnish you with a bank guarantee by a scheduled commercial bank recognized by you for the sum specified therein as security for compliance with its obligations in accordance with the contract;

AND WHEREAS we have agreed to give the supplier such a bank guarantee;

NOW THEREFORE we hereby affirm that we are guarantors and responsible to you, on behalf of the supplier, up to a total of ..... (amount of the guarantee in words and figures), and we undertake to pay you, upon your first written demand declaring the supplier to be in default under the contract and without cavil or argument, any sum or sums within the limits of (amount of guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the supplier before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the contract to be performed thereunder or of any of the contract documents which may be made between you and the supplier shall in any way release us from any liability under this guarantee and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until the ..... day of ..... 20.....

Our ..... branch at .....* (Name & Address of the .....* branch) is liable to pay the guaranteed amount depending on the filing of claim and any part thereof under this Bank Guarantee only and only if you serve upon us at our .....* branch a written claim or demand and received by us at our.....* branch on or before Dt..... otherwise bank shall be discharged of all liabilities under this guarantee thereafter.

.....

(Signature of the authorized officer of the Bank)

.....

Name and designation of the officer

.....

Seal, name & address of the Bank and address of the Branch

**Preferably at the headquarters of the authority competent to sanction the expenditure for purchase of goods or at the concerned district headquarters or the State headquarters.*

1. LC-MS MS (HRMS) (Liquid chromatography mass spectrometer

A complete HRMS work station capable to analyze differential expression of protein (targeted/untargeted proteomic/ identification of protein), PTM, Metabolomics, Lipidomics and small molecule/synthetic molecular characterization.

Descriptions	Required Technical Specifications
Mass Analyzer	The HRMS should be suitable hybrid analyzer, High Resolution accurate Mass Spectrometry with a combination of Quadrupole with ultrahigh resolution MS with Nano LC and UHPLC. The complete workstation with all the required software and all pre -requisites for operation of the system.
Ion Source	The system should be supplied with API source hosing with A. ESI probe compatible with flow rate from 1ul/min to 2ml/min with desolation temperature up to 500^0C B. APCI probe compatible with flow rate from 50ul/min to2ml/min with desolation temperature up to 500^0C C. Nano ESI source compatible with flow rate from 50nl/mi to1000nl/min without flow splitting. D. Direct infusion Syringe with syringe pump and divert valve for calibration and direct infusion of sample. E. Ion Sources: The instrument should have at least ESI/APCI, APCI, and polarity switching options for detecting both molecular mass ions (positive/negative).
	The system should be capable of performing Qualitative and relative Quantitative analysis *(like iTRAQ, TMT, SILAC etc.) with the highest sensitivity, accuracy, precision and reproducibility. It should also be capable of performing label-free quantitation across the mass range such as SWATH/DIA/MS(e)etc.
Quadrupole Mass Range	A- Shall have mass range from 50m/z to 2500m/z or better. B- Segmented mass filter, providing variable and step-less precursor isolation width selection from 0.4 Da to full mass range
Mass Resolution	This system should have maximum resolution with technology: Quadruple Mass range:50-3000 Da or better to work with different molecules Minimum resolution at m/z 900 (approximately) should be ≥1,00000 FWHM
Mass Accuracy	Should have excellent mass accuracy less than 1 ppm without frequent Calibration for 5-7 days.
Sensitivity	• Full scan, SIM scan, Data dependent MSn, DIA/SWATH with variable quadrupole isolation window from 10 Da or better, Parallel reaction monitoring etc. • 500 fg reference standard on column S/N 100:1, SIM: 50 fg reserpine on column S/N 150:1 or better. • Scan speed of 12 Hz or higher. • System must have advance collision cell for effective fragmentation of analytes like EAD/HCD etc. especially for the low mass region of

	phosphor proteome analysis.
Acquisition speed	• Acquisition speed: High speed, with very high response time, and efficient fragmentation is expected (≥ 12 Hz).
Scan Functions	• Full Scan, SIM Scan, data dependent MSn, DIA /SWATH with variable quadrupole isolation window from 10Da to 100Da or better, parallel reaction monitoring etc. • Should have data dependent acquisition (DDA), MS2 scan by DDA with top N experiments. In targeted SIM manner based upon a sample dependent, triggered MS2 by exclusion mass list. M2 Scan by data independent analysis. • The mass spectrometer must be capable of fast polarity switching acquiring one spectrum in positive and one in negative with <1.4 Hz cycle time or better. Or one full cycle in <1 sec (one full positive mode scan and one full negative mode scan. • On-the-fly charge state de-convolution for intelligent ddMS2 on intact proteins applying Smart HCD.
DynamicRange	The system should have in-spectrum dynamic range of 5000:1 or 4 order of linear dynamic range
Fast and High-Resolution LC System (For discovery phase and validation phase)	• Fully biocompatible Quaternary gradient system with vacuum degasser, auto sampler and column oven for ultrafast separations. • Flow accuracy of ±0.1% or better • Injection volume accuracy of +/-.0.5% or better. • Gradient precision 0.15% RSD or +/-0.04 min SD, whichever is greater. • Auto sampler should be available with capacity of at least 80 vials of 1.8 ml/2 ml and should be capable of accommodating 96 well plate with injection volume. • The system should have sample temperature control from 4–40 ^{0}C programmable in 1^{0}C increments (ambient temp: 20^{0}C). • System should have max: Pressure equal or more than 15000 PSI or better. • Both the HPLC systems should be from same manufacturer & have single point software-based control with Mass Spectrometer. • Suitable mechanisms for the degassing of solvents. • LC maintenance kit and tool kit should be provided. • System should come with required quantity of strong ion exchange columns, C18 columns.

Workstation and Software	Suitable workstations and all interfacing hardware and software for instrument (s) control, data acquisition and data processing must be provided. The latest model of computer necessary to handle, analysis and store such data should be provided. For each of them as spectrometers a minimum of 2 work stations (One for acquisition & one for processing) should be provided, one for controlling the mass spectrometer, the LC and auto-sampler the others for data analysis and storage. All workstations should be having a network enabled laser colour printer. All hardware and software including drivers, monitor, device interface cards/network card must be preinstalled and preconfigured on the computer provided. Complete software for protein identification, quantification and characterization, peptide mass fingerprinting, data base search and biomarker studies. Complete advanced software for proteomics, and metabolomics analysis, database searches, quantification, well as all relevant metabolite databases should be provided including relative & absolute Quantitation. List of software with their application details should be provided. All the software must be original and with perpetual license. Software updates including newer versions should be provided free of cost during warranty period. Software should allow discrimination of false discovery and allow grouping of proteins to reduce complexity in results. Processing software for unattended batch processing of data files for protein identification and expression analysis from LC / MS-MS, gel-based experiments. Output of the data analysis/processing software should meet the data required to submit for publication in major journals. Advanced software for data analysis and publication like scaffold and peaks studio software etc. should be included. Proteomics integrated software to understand the biological context of identified proteins including pathways.
Columns:	• Sub 2-micron particle size C18 column -2 Qty • Suitable MS Columns for HILIC application -2 Qty • Suitable MS Column for Metabolomics application-2 Qty.
NitrogenGenerator	A suitable imported Nitrogen Generator with inbuilt compressor. A suitable imported gas generator with compressor capable of providing nitrogen gas at the required 99% purity, pressure and flow rate for the Mass Spectrometer must be quoted. The compressor should be noise-free. UHP Grade N2 Cylinders 2 Nos N2 Regulators (S.S.) 2Nos Moisture/ hydrocarbon trap 1 No must be supplied
UPS	15 KVA UPS with 1 hr battery back and isolation transformation in built. Number of electrical wall sockets with ampere value should be mentioned.
Gases	If any additional gasses required should be quoted with regulator

References	Should provide at least 4 references from reputed proteomics research lab/institutes/ public funded universities/ institutions where it is being Installed and working well.
Warranty	Comprehensive 3 year of warranty
Installation andtraining	Details should be clearly given for the installation, performance verification, operation manual and on-site training part necessary for the system (as free of cost) Note: Necessary items or chemicals required for the installation, demonstration and calibration of the system should be arranged by the supplier
Other condition on service/ maintenance and user list	a. Please provide address of your local service office with availability of number of trained engineers to attend any service issue in HRMS. b. Also mention the anticipated down-time of the machine, if there is any service call from us (in minimum days) c. A user list containing minimum of 10 recent installations of HRMS (in reputed Indian Institutes/ R & Ds; within the last 3 years) similar to the quoted instrument should be attached along with details of supplied model number, year and contact address of the end users.

OPTIONAL ITEMS:

Nano flow LC System (for Discovery Phase) with high pressure binary gradient Nano flow pumps Pump	• Flow rate in the range of 50-1000 nl/min without flow splitting (Split less) System should offer reproducible gradient down to100nl/min. • The system should include an additional isocratic loading pump (Flow range 1-50 µl / min) for sample enrichment on trap columns to allow analyses of low abundant analytes. • The system should have working pressure of 10000 psi or more and a flow rate accuracy of 1% and gradient accuracy of 1%. • Temperature–controlled column compartment [Ambient+5DegCto 40Deg C (±1 Deg C)] with integrated 10-port valves. • Programmable injection with auto-sampler (from 100 nl to 10 µl with standard 10µl loop or higher loop) with working pressure up to 10,000 psi or better. • The auto-sampler should have capacity to hold microtiter plates or multiple sample vial racks. • Suitable mechanisms for the degassing of solvents. • System should come with required quantity of strong ion exchange columns, C18 columns, C4 columns with guard/trap columns. • Nano LC Column- Qty 5 • Nano Trap LC Column- Qty 5.
ESI Nano Source	Suitable Nano Spray Source to be offered for coupling with Nano LC for Proteomics studies.
Optional Data bases	• Optional database for Metabolomics • Optional Databases for Lipid omics to be offered.
Manpower:	• Technically Qualified Trained Manpower for running the instrument for 12 months to be offered separately in the offer. • Additional cost of the manpower for two years to be offered separately.

2. FT-IR SPECTROMETER (FT-IR) WITH ATR

Specification:

- Spectral range: 7000 – 400 cm-1 or better
- Spectral resolution: 0.5 cm-1 or better for the whole wavelength range
- Detector: DTGS/DLATGS
- Wave number reproducibility/precision: 0.01 cm-1 or better
- S/N: 50000:1 for peak-peak or better for 1-minute scan
- Interferometer: Michelson interferometer or equivalent interferometer for fast scanning
- Enclosure: Sealed and desiccated
- Operating Temperature range: ambient temperature
- Software: Windows based PC software, facility for qualitative and quantitative analysis.
- Power: 220 – 240 V AC, 60/50 Hz

Essential Accessories:

- Pure diamond ATR accessories compatible with the main instrument for analysis of solid, liquid, paste, powder and gel samples.
- Liquid Demountable cell mount
- Sample preparation accessories such as 13-15 Ton Hydraulic Press, Agate Mortar Pestle, KBr Die set, IR grade KBr powder (500 g), Liquid and solid sampling accessories
- KBr rectangular window- 02 packs
- Pellet Holder for solid and liquid sample: 04 nos.
- Suitable online UPS with 30 minutes back-up to run the instrument and computer
- **A suitable dehumidifier. 30 lit per day or higher capacity.**
- Branded Desktop Computer (Intel core i5 or better processor,20" Monitor, DVD Writer) and Laser printer

Warranty:

- Minimum 3 years warranty on Interferometer, Source, Laser and ATR accessories.

Other feature (Optional):

- May include a starter library and also include possibility to create user own libraries.

Exact need of UPS/ Voltage Stabilizer, No and type of electrical wall sockets to be required for Installation must be mentioned.

3. CONFOCAL MICROSCOPE WITH LIVE CELL IMAGING FACILITY

Sl.no	Specifications / Parts / Accessories of Tender Enquiry
A	**System Nature & General Specifications:**
A.1	The Laser Scanning Spectral Confocal microscope system should be of latest state of the art technology capable of high sensitive spectral confocal imaging of fixed & live biological samples with Super resolution setup capable of resolution enhancement in XYZ directions.
A.2	Instant highly resolved real-time acquisition of super resolution imaging modality to have resolution 120-140 nm in XY and 200-350 nm resolution in Z .Super resolution imaging should be based on a dedicated SR multipixel detector or a very high sensitive multipixel detector with QE/PDE of 55%.It should be completely spectral in nature for UV, VIS and NIR range. Super resolution speed should be minimum 10fps.
A.3	The system must offer multimodal imaging capabilities such as multichannel fluorescence imaging, Z-stack, co-localization, time-lapse imaging, advanced 3D imaging and Photon counting experiments, FRET, FRAP should be available as standard.
A.4	System should be capable of low light imaging with minimized bleaching and phototoxicity using high sensitive detectors with PDE/QE higher than 50±5%.
A.5	Dedicated UV Laser port and a 405nm 30mW laser. Visible lasers 488nm, 514nm, 561nm and 638nm are required.
A.6	Laser combiner with AOTF control for visible lasers.
A.7	It should be capable of scanning various samples with different components in high resolution imaging.
A.8	5 spectral detectors must be Array based or Multi pixel photon counter in nature and should be responsive in VIS and NIR range from 400 nm to 800 nm.
A.9	The system is also intended to be used for excitation, scanning applications of any newly develop/ available compound for various research applications.
B.1	**Fully Motorized Inverted Microscope**
B.1.1	Fully Motorized and computer controlled Inverted Fluorescence Microscope for BF, DIC, FL with built-in TFT display for full control of all motorized microscope functions.
B.1.2	Programmable, motorized Scanning stage along with accessory for high speed XYZ imaging and with universal sample holders for slides, Petri dish and other live cell sample holders like 6 well plate, 96 well plate for tile, mosaic/Tile and multipoint imaging.
B.1.3	A fast-focusing system for Z stack imaging with step size of 10-15 nm or better.
B.1.4	A binocular observation tube with a pair of 10X eyepieces of FN 22 or more should be a standard supply.
B.1.5	The microscope should be equipped with LED illuminations for transmitted and Fluorescence light observations with LED lamp with lifespan of at least 10,000 hrs & TTL shutter.
B.1.6	Suitable for lenses with magnifications from 1.25x to 100x .
B.1.7	Objectives: High-resolution confocal grade Plan apochromat objectives corrected for both UV & VIS lines 10x/0.40, 20x/0.75, 40x/0.9, 60x/63x/1.40 oil immersion along

	with DIC accessories for all objectives.
B.1.8	Motorized 6 position condenser with NA 0.55 and with DIC prisms for all objectives with Motorized analyzer, polarizer and Motorized DIC slider should be included.
B.1.9	Motorized fluorescence turret with 6 positions for filter cube and motorized shutter .
B.1.10	Inbuilt shutter and fluorescence filters for DAPI, FITC/GFP, TRITC and CY5 should be quoted.
B.1.11	Motorized 6 position DIC nose piece, motorized polarizer, Binocular ergo tube.
B.1.12	High precision built in Z-focus drive with step resolution of 10-15 nm or better.
B.1.13	LED light source for Fluorescence.
B.1.14	Microscope controller, Smart Move for easy control in xy and z, Fluorescence Intensity Manager Quick switching from coarse to fine drive should be offered.
B.1.15	Camera port & Additional Infinity Port.
B.1.16	For H & E stained samples, and wide field based multi-channel, z stack, time lapse imaging, a dedicated scientific grade dual mode (colour and monochrome) camera should be offered. The camera should have pixels size should be 4.5X4.5 micrometer, **CCD/CMOS chip, 2.5 million** or better net effective pixel resolution, FireWire or USB III based connectivity, at least **35 FPS** or better capturing speed at full frame and must be controlled by the same confocal software.
B.1.17	Spill protection for motorized nosepieces with sealing ring and collecting container.
B.1.18	Optical equipment for brightfield light source, as well as interference contrast prepared for confocal microscopy.
B.1.19	Immersion oil 10 quantities.
B.1.20	Accessories and holder for confocal scanner.
B.1.21	Laser safety equipment.
B.1.22	Live cell imaging capabilities: Facility for live cell imaging including Incubation system with Temperature, CO2, humidity control and complete safety regulations should be offered. The parameters for Incubation system should be controlled by the imaging software
B.2	**Confocal Detection System UV & VIS .**
B.2.1	A true confocal point scanning system including Laser as excitation light source, prism-based/grating-based spectral detection design with computer controlled adjustable bandwidth for all internal detection channels.
B.2.2	The system should have at least 5 spectral detectors for 5 colour simultaneous detection in combination with the GaAsP/ HyD detectors, offers enhanced detection efficiency and photon counting as standard.
B.2.3	- Allows recording of two-dimensional excitation-emission spectra supported by software for setup and display of 2D spectra .
B.3	**Super Resolution Detection System:**
B.3.1	The system should be equipped with a Prism based / Gratings based spectral dispersion mechanism for highly sensitive spectral Point Scanning imaging .
B.3.2	System should have multi- Pixel Photon Counter Detector and should be spectral/filter in nature. Minimum TWO of such high sensitive detectors with PDE of 50±5% @500nmor a dedicated super resolution detector should be present in the system with detection efficiency >45% @ 500nm.

B.3.3	A PMT based Transmitted Light detector for morphology imaging .
B.3.4	Detection range should be 400 nm to 800 nm for VIS and Far-Red imaging.
B.3.5	GaAsP/HyD with QE of 50±5% or dedicated SR detector.
B.3.6	Super Resolution Detection Capability .
B.3.7	Analog, reflection and photon counting detection modes.
B.3.8	Power counting: mode should be available.
B.4	**Scanning System**
B.4.1	A state-of-the-Art high speed Galvo scanner should be offered with minimum FOV 18-20 or more.
B.4.2	Scanning Resolution should be at least 4KX4K Pixel or Higher .
B.4.3	Optical Scanning Zoom range 0.8 x to 40x or more .
B.4.4	Scanning speed should be at least 10 fps in 512x512 format and should increase to 200 fps at least using ROI .
B.5	**Scanning Imaging modes**
B.5.1	Line, ROI, upto 6D imaging, lambda imaging and Photon Counting imaging.
B.5.2	Sample imaging for Functional information recording .
B.5.3	Imaging for cellular microenvironment
B.5.4	Spectral imaging with dyes such as Cy5 should be possible .
B.5.5	Online Auto fluorescence separation should be available as standard .
B.5.6	Dye separation of closely overlapped dyes should also be available as standard.
B.6	**Laser Excitation system**
B.6.1	Lasers 488nm,514nm,561nm and 638nm minimum power should be 20mw.
B.6.2	All the visible lasers should be controlled and modulated through AOTF .
B.6.3	Provision and port to add/upgrade with individual laser line should be available .
B.6.4	Laser 405 DMOD : Dedicated 405nm laser with dedicated beam path and dedicated laser modulation with Specialized DMOD device should be available in the system. Laser Diode with wavelength 405 nm cw for fluorescence imaging with dyes such as DAPI or Hoechst. Laser intensity is directly modulated (DMOD), suitable for imaging with region of interest (ROI), in detail: - Wavelength 405±3 nm - Laser output power 30 mW - Direct modulation of laser intensity (DMOD) .
B.6.5	Laser Port 405
B.7	**Online Spectral Super Resolution system**
B.7.1	The system must be equipped with integrated online and instant Spectral Super resolution imaging modality with resolution 120 nm in XY and 200 to 350 nm resolution in Z. At least 3 colour simultaneous spectral super resolution should be possible using highly sensitive detectors .
B.8	**Computer workstation & Monitor**
B.8.1.1	Factory tested and configured High Power HPZ4G4 or similar Workstation with Windows 10 Professional (64 bit) operating system. A high-performance professional graphics card with advanced Pascal GPU architecture addresses the highest demands in 3D visualization and computing acceleration. - intel Core i5-8500 processor (6 cores / 6 threads).
B.8.1.2	64 GB working memory, Nvidia Quadro RTX 4000 graphics card with 8 GB graphic card memory and 2304 CUDA cores. fast 256 GB SATA SSD system drive. Very fast 512

	GB M.2 SSD hard drive for temporary storage of data.6 TB HDD drive for storage of data. Intel I350-T2 network adapter. HP 9.5mm Slim SuperMulti DVD writer. Windows 10 IoT Enterprise LTSC 2019. Keyboard, mouse and mouse pad.
B.8.1.3	High brilliance Curved monitor : Display size (diagonal): 95 cm (37,5 inch); Resolution (native): 4K-Wide 3840 x 1600 @ 60 Hz; Contrast ratio: 1000:1 static, 5000000:1 dynamic .
C	**SOFTWARE:**
C.1	The imaging software should control all the motorized functions of the confocal microscope. It should have the capability of multi-dimensional acquisition namely PT (point), XT, XZ, YZ, XZT, XYT, XYZ, XYλ, XYZT, XYλT, XYλZ, XYλZT .
C.2	Advanced software for 3D reconstruction and processing of 3D data having features like Transparent, Maximum Intensity and Depth Coding, shadow projection, clipping, Orthogonal Sectioning and Annotation tool to add comments to 3D volume.
C.3	The software should have analysis function such as intensity measurement over time, over depth and over lambda. Advance measurements like Co-localization should be possible.
C.4	Confocal system control software for control of scan process and image processing. - Control of motorized hardware. - Multidimensional image acquisition. -Software-aided hardware configuration based on fluorophores used. - An unlimited number of regions and positions should be defined for high resolution scans and multiwell projects
C.5	Visualization software module for the reconstruction and processing of 3D data: -Fast motion and processing by GPU-based algorithms. - Various projection modes: Transparent, Maximum Intensity, and Depth Coding. - Individual settings for intensity. minimum and maximum grey level, gamma and opacity for each channel. - User defined interactive shadow projection to emphasize three dimensional structures. - Sophisticated Movie Editor for the generation of complex 3D animations. - Orthogonal Sectioning tool, including rotatable section planes and 3D cropping capabilities. Annotation tool to add comments to a 3D volume that are saved with the data set.
C.6	Dye Finder and Co-Localization modules
C.7	Dedicated Imaging Software for thick tissue imaging: a. Should support wide range of applications to generate insights from images with total freedom to analyse and explore microscopy data sets on a single platform. b. Ability to train and apply machine learning-powered Pixel Classifier for image enhancement and segmentation of 2D to 5D microscopy data sets. c. Deep Learning and Python/Matlab/Java or equivalent Integration to apply any of pre-trained deep learning models for image enhancement and/or segmentation like Cell Pose, Star Dist etc. d. Should include image analysis recipes for nuclei count and tracking, cell count and tracking, particle count and tracking, cell proliferation assay, neurite outgrowth, wound healing (phase contrast), stem cell colony detection (phase contrast), cell tracking (phase contrast), object detection (meshes), object detection (spots), object tracking and lineage tracing. e. Analysis and editing tools for reconstructing complex 3D shapes such as organelles, neurons and other cells, Object Classifier and machine learning powered tools for classifying objects and identifying new phenotypes. f. Pixel and object colocalization analysis (including computation of Manders' and

	Pearson's correlation coefficient). g. Rendering multi-channel 2 to 4D images of up to 3 TB (raw size) with detected objects/cells/neurons/tracks. h. Highly interactive visualization tools like Ortho Slicer and Clipping Planes to selectively reveal regions, objects and relationships of interest in raw and analysed data i. Image and object text tagging system for collaborative work to visually keep track of different objects/regions of interest. j. Video Animator to generate high fidelity video animations of up to 4K and 60 fps. k. Virtual reality integration for interactively navigating and exploring both the raw voxel data and segmentation results using advanced VR headsets. Should be provided with at least 1 year subscription
Others	System should be quoted with 3 years warranty.
	Imported Antivibration Table and Computer Table should be quoted with the system.
	Technically Qualified Trained Manpower for running the instrument for 12 months to be offered separately in the offer. Additional cost of the manpower for two years to be offered separately.
	Technical Support for conducting an annual workshop should be provided for the 3 consecutive years.
	An Online Branded 5 kVA UPS with minimum 30 minutes backup should be provided. Number of electrical wall sockets with ampere value should be mentioned.

4. SOLAR SIMULATOR

1.	Solar Simulator Class	Class AAA (As per ASTM E927/IEC 60904-9/JIS C8912) (Attach Test Reports for class AAA)
2.	Lamp type	Xenon Arc
3.	Lamp lifetime	1,000 Hours or better
4.	Power	100 W or better
5.	Power output	100 mW/cm^2 (1SUN) (Adjustable ±10% or better)
6.	Illuminated area	50 mm × 50 mm or better
7.	Light Source	Steady State
8.	Air Mass Filter	AM1.5G Standard or equivalent
9.	Spectral Range	400 to 1100 nm
10.	Spectral Match	± 25% or better
11.	Collimation Angle	± 4 deg or better
12.	Non-uniformity of irradiance	≤ 2% or better (Need to demonstrated)
13.	Temporal Stability	≤ 2% or better
14.	Optimum Working Distance	8" (inch) or better
15.	Suitable to measure PV technologies	As per AAA standard
16.	Power supply	110-220AC Volts, 50-60Hz

The system should be capable of photo-electrochemical reaction and solar cell measurements.

Accessories

Calibrated Reference Cell with Connecting Cables

Material: Standard Silicon cell or Mono-crystalline Photovoltaic Cell encased in a Metal Enclosure with protective quartz window and equipped with temperature sensor.

Attach Calibration certificate as per NIST or AIST standard.

Attachment for I-V measurement and Quantum efficiency facility (Quote separately as an optional item)

Warranty: 3 years

- **Computer and Printer:**

Branded PC with latest configurations (Core- i5, 4GB RAM, 1TB HDD, 19″ LED Monitor, DVD Writer external) and Laser jet printer.

- Suitable online UPS with 30 minutes back-up to run the instrument and computer
- No and type of electrical wall sockets to be required for Installation must be mentioned

Optional: Up gradation provision to higher wavelength.

5. PARTICLE SIZE AND ZETA POTENTIAL ANALYZER

Single Proven system for measurement of Nano Particle Size, Zeta Potential and Molecular Weight system at variable temperature (0 – 90°C ± 0.1 °C or higher) with inbuilt temperature controller**.**

Mainly applicable for colloids, emulsion, biopolymers (protein, nucleic acid) /surfactants/ nanoparticles and others.

Measuring Principles: All three-measuring principle [Dynamic light scattering with ability to minimize multiple scattering using Non Invasive Back Scattering detection technique, Laser Doppler Velocimetry (electrophoresis) and Static light Scattering should comply for Particle Size, Zeta potential and Molecular mass measurement].

System should comply with latest ISO guidelines

Zeta potential measurement	
Range	± 400 mV or higher
Size Range	5 nm to 90 micrometer
Sample Concentration	10 mg/mL or lower to 40% w/v or higher
Sample conductivity	180 mS/cm or higher
Minimum sample volume	20 µl or lower
Mobility Range	> ± 20µm.cm/V.s
High and Low Salt Concentration	System having facility to take care of Low and high Salt concentration is preferable
Cuvettes for Zeta Potential measurement	Should include adequate number of suitable cuvettes for measurement in aqueous and non-aqueous medium
Particle size analysis	
Range	0.40 nm to 10.0 µm or better
Principle	Dynamic Light scattering
Minimum sample volume	15 µl or less
Measurement provision	Automatic and manual facility
Sample Concentration	Minimum sample concentration ~ 0.2 mg/mL (of 15 to 20 kDa protein), Max. sample concentration around 40% w/v
Necessary cuvettes for Size measurement	Should be provide with cuvettes for use in aqueous and non-aqueous medium
Molecular weight determination	
	Should have facility to measure MW using the backscatter angle (for small sized samples such as < 3nm) and Debye plot The same measurement should be able to determine the A2 second virial coefficient and thermodynamic dissociation constant
Measuring range (mass)	980 Da to 20 MDa or better.
Laser	Laser Power: Preferably low power laser (630 - 660 nm) with auto attenuation feature for higher

	sensitivity of the instrument.
Air Purging	Dry Air or nitrogen purging facility to avoid condensation.
Optics	Fixed Optics with automatic alignment prior to measurement.
Sensitivity (Toluene Count)	Very good sensitivity. Mention the value with reference to Toluene count/photon count.
Correlator	The system should have Digital correlator minimum 25ns with up to 4000 channels.
Auto initialization	Automatic
Detector	Avalanche Photo Diode Detector or equivalent
Necessary cuvettes for Size measurement	Should provide Cuvettes for use in Aqueous & Non-Aqueous Medium -12mm o.d Square re-usable Polystyrene 100 Cuvettes with 100 stoppers, 1.5 ml volume -12mm o.d Glass Cuvette – 01 no - Low-volume quartz batch cuvette (12µl volume) for size measurement- 1 no
Measurement time	should be 10 Sec or lower
Standard	Ready to use Zeta potential Standard- 01 syringe
Software	Suitable software for running the equipment, data acquisition, data analysis, data transfer, graphical presentation etc. The key features are to be mentioned. Should be compatible with Windows OS.
Future Upgradation Option	Should be clearly written. Onsite up gradation to higher specification is preferable
Computer, Printer and UPS	Desktop Computer with Intel core i5 or better processor/DVD Writer, monitor = 19″ and Laser printer. A 3 KVA on line UPS with power back up at least 30 min.
Warranty	3 years from the date of Installation
Computer and printer	Branded PC with latest configurations (Core- i5, 4GB RAM, 1TB HDD, 19″ LED Monitor, DVD Writer) and Laser jet printer.

Other conditions:

- Installation/Demonstration/Application Training at site: It should be free of cost by the supplier.
- Application Training at site: At least 2-3 days to the group of users
- User list: Users list should be enclosed during 3 years.
- Service Downtime: 24 Hrs
- No and type of electrical wall sockets to be required for Installation must be mentioned
- Nearest Service Centre: Should be mentioned, preferable near to Bhubaneswar

6. ULTRAPURE WATER PURIFICATION SYSTEM

Specifications

- Make and Model should be mentioned.
- System should produce analytical grade ultrapure water directly from tap water feed, which can be used in applications like HPLC, GC-MS-MS and highly sensitive molecular biology works like SNP genotyping, the system designed to produce ultrapure water in agreement with the quantitative specifications of Type I water as described in- ISO 3696, ASTM D1193, EP/USP Purified Water, CLSI–CLRW /NCCLS.
- Conductivity: 10- 2000 µS/cm @ 25°C
- Hardness: < 300 ppm (as CaCO3)
- pH: 4 to 10
- Fouling Index: up to 12
- Temperature: 2 to 35 °C
- Free Chlorine: up to 3 ppm
- System include OEM made pre-filter to take care feed water with TDS as high as 5000 ppm & SDI up to 50.
- Iron Removal Filter must be from OEM and having the backwash and rinse facility, capacity should be up to 400 L/Hr and which can take care up-to 4 ppm of Iron contamination.
- **Three Stage pre-treatment cartridges** - Main System contain three Stage pre-treatment cartridges, include silver imprinted activated carbon which prevents the proliferation of Bacteria present in tap water and anti-scaling compound compounds must to eliminate hardness and protect the RO membrane against oxidation, scaling and plugging.
- High flux thin film composite polyamide RO membrane (MW>200 Dalton) with 95-99% rejection.
- RO pressure, RO water quality, RO membrane efficiency (% ion rejection) seen on display.
- Conductivity cells before and after the RO Membrane and should have high recovery loop with capillary tube and diaphragm valve to reduce the wastage of feed water.
- **EDI module -** Auto regenerated Electro deionization module with Carbon beads at cathode.
- EDI (Electro-deionisation) module should not require softening pre-treatment.
- Coaxial resistivity cell with 0.01cm-1 cell constant for optimum measurement accuracy as required by ASTM D 1125-95 and comply USP <645>
- To avoid maintenance errors and to improve traceability, the internal water purification cartridges should have a built-in RFID [Radio Frequency identification] tag or equivalent/better mechanisms.

- Large built-in display with Auto diagnostic facility ensures real time various Error Number and Alarm Code for complete traceability.
- 50L reservoir with air sanitization kit to store product ensuring the water quality
- Optional data management and monitoring software ensure real time data reliability, traceability, and access to system history, needed for various world class accreditations.
- To ensure water quality minimum 3 Numbers of conductivity and resistivity cell
- Application Specific cartridges to remove ionic and organic contaminants to trace levels
- Cartridge attach to the water system easily.
- 17 watt or better, low pressure mercury vapor lamp made of ultrapure quartz with dual wavelength (185 and 254nm) supplied.
- To prevent deterioration of water quality during periods of non-use, the ultrapure water system able to re-circulate water.
- Auto regenerated Electro deionization module with Carbon beads at cathode.
- Optional point of delivery unit with
- Adjustable height and rotating arm-adjustable to any glassware.
- Multi-color monitor displaying: resistivity, level of water in reservoir, volume dispensed and other alarms, to be directly accessible from the point of delivery unit
- 24. Point of delivery unit with the polishing filters at the point of use. Final Filters Options:
- Pharmaceutical grade, final filter with 0.22 micron membrane filter in stack disc configuration,
- UF cartridge at the collection end with LRV is between 5.6 and 7.65 over challenge range of 220 and 22000 Eu/mL.
- Specific filter to remove volatile organics.
- Specific filter for trace organic applications.
- **TYPE II (Analytical Grade) water quality:**
    - Resistivity : 10-15 MΩ·cm @ 25° C
    - TOC : <30 PPb
    - Product water delivery : 3L/hr
    - Silica Rejection : > 99.9%
- **Type I Product [ASTM grade]water quality:**
    - Resistivity : 18.2 MΩ·cm @ 25° C
    - TOC : <10 PPb
    - Bacteria : < 0.1cfu/ml
    - Product water delivery : >1.5 L/min
    - Pyrogen Levels (EU/mL) :<0.001
    - RNase Level (ng/mL) :< 0.01
    - DNase Level (pg/µL) :< 4

- ≥1 year comprehensive warranty for the complete instrument installed. Warranty of all items will strictly be applicable from the date of installation.
- The equipment provided with all necessary accessories and spare parts to run without hindrance. The system suited to Indian system of electrical inputs (230V/ 50Hz).
- ISO certification for QMS as well as CE and others for international safety standards is also needed. Valid document in support to be submitted.

Warranty: Comprehensive warranty for 3 Years.

Condition of supply:

1. Requirement of electrical plug sockets to be mentioned with ampere value.
2. The instrument should be supplied with required cartridges, tank and pre- Filter.
3. Rate of extra cartridge with all accessories should be quoted separately.

7. LYOPHILIZER/ FREEZE DRYER

- 8 Ltrs. bench-top freeze dryer, 3Lit/24hr, with automatic & manual process, used with 12-port T-type manifold or 8-port acrylic drying chamber.
- Patented Jog-Dial & Touch Button Control System.
- PL (Product Liability) Insurance.
- With Certificate & Traceability: Controlled by Serial Number, Certificate, Delivery-information, and Traceable Data Base System.
- Ideal for wide range from pharmaceutics, biology, food industry to petro-chemistry and semiconductor Industry, etc.
- Ergonomic design and compact body size for all laboratory tables
- Allows automatic or manual process control * LCD indicates temperature and vacuum
- Rapid integrated hot gas defrost function for quick next cycle turn-around
- LED indication light on in case of suitable temperature and vacuum
- Can be controlled temperature and timer at automatic mode
- Homogeneous temperature distribution across all shelves in dry chamber
- Warranty: 3 years.
- Requirement of electrical plug sockets to be mentioned with ampere value.

Sublimation Rate (Lit/day)	3Lit / day
Chamber & max condenser capacity	Chamber : 8 Lit Condenser : 10 Lit
Set temperature range	-90 ~ -60°C
Compressor & defrost-type	1/2 HP, Manual
Display	Digital LCD with back-light function
Material	Stainless-steel (SUS304)
Dimension(w × d × h) & Weight	Should be mentioned
Electrical requirement	AC 230 V, 50 / 60 Hz

8. CRYOMICROTOME

- Specifications: Fully motorized
- Freestanding, motorized open-top cryostat with independent specimen temperature control.
- Spacious, easy-to-clean cryochamber with illumination.
- Removable heated glass sliding window.
- Cryochamber temperature setting down to -40 °C in 1° steps.
- TEMPERATURE:
    1. Permanently cooled (down to -45 °C) quick-freeze shelf & chamber temperature
    2. Separate specimen fast-cooling adjustable down to -50 °C for Extremely fast Freezing with Temperature setting range: -10 °C to -50 °C in 1° steps—as an additional option
- DEFROST:
    1. AUTOMATED Programmable automatic 24-hour defrost cycle. Defrost cycle duration programmable from 6 to 12 minutes.
    2. Additional manual defrost feature MANDATORY
- DISPLAY:
  Cutting speed range, cryochamber and specimen temperature, defrost time and duration, coarse feed and object temperature can be conveniently preselected by BUTTON-push; Section THICKNESS selection to be located on CONTROL Panel
- Microprocessor-controlled, Foil-protected control panel with locking key to prevent inadvertent changes of programmed parameters.
- Counterbalanced hand wheel with SPRING Balance to ease stress while rotating hand wheel
- Hand wheel lockable in two positions, for manual sectioning. Locking status indicated on display.
- INSULATION:
  Highly efficient insulating materials to be used in the vacuum panels lead for effective power saving up to extra 10%
- Motorized sectioning operated via control panel and foot switch.
- Section counter with reset. Sectioning window adjustment.
- Enhanced User safety:
- Centering the hand wheel handle must be present
- Unique Stretching Device with Ant-Roll Glass plate that does not allow frozen sections to roll or curl; with a precision gap of operation as low as 0.15mm
- 3 sectioning modes: intermittent, single and continuous stroke. Emergency stop switch.
- 2 sectioning speed ranges selectable: 0.1 - 170 mm/s & 0.1 - 100 mm/s
- The new anti-roll system with four usable glass insert edges for cryostat knife holders
- SAFETY: For PROTECTION from Pathogens, Cryostat must have the following features:

1. Proven disinfection against Hepatitis-B, Polio Virus, Simian Virus 40, Herpes Simplex Virus, Vaccinia Virus, Avian Influenza Virus—document proof must be submitted to prove the effectiveness of cryostat against these viruses
2. No hassle to pour or fill cryostat hamper with disinfectant, rather effective spraying on areas should solve purpose
3. Routine pathogens list must consist of 13-15 test germs, list MUST be available with the brand for sharing

- Additional maximum speed setting of: 210 mm/s (Vmax 210 mm/s)
- Section thickness range:
  1. 0.5 to 300 µm selectable with increments as below--
  2. in 0.5 µm increments from 0.5 to 2 µm,
  3. in 1 µm increments from 2 to 10 µm,
  4. in 2 µm increments from 10 to 20 µm,
  5. in 5 µm increments from 20 to 60 µm.
  6. in 10 µm increments from 60 to100 µm.
  7. in 50 µm increments from 100 to 300 µm.
  8. X/Y/Z specimen precision orientation of 8° & Specimen retraction: 50 µm
- Total horizontal specimen feed: approx. 25 mm, Total vertical stroke: approx. 60 mm
- Programmable trimming: 5 - 150 µm, selectable in 6 steps, in 5, 10, 30, 50, 100 and 150 µm increments.
- Unique feature of Motorized coarse feed in 2 steps as per user's need: 500 µm/s and 1000 µm/s
- Programmable reverse section counter (preset counter)—to give the exact number of sections with precision
- Section thickness totalizer; Battery-powered electronic memory back-up
- Capability to attach an electrohydraulic lifting device for individual working height adjustment.
- MUST be completely independent from the instrument, NOT Integrated.
- Should have at least 3-5 installations of Research Model in East India in which reputed Government Universities/Colleges must have this exclusively for Research Purposes
- Should have dedicated Service Support only for East India with a team of company's own service engineers (at least 3 persons, not of distributor's) headquartered in East for prompt support at User Place.
- Should have European CE & USFDA Approved certificate
- Online UPS if required should be included.
- Number of electrical wall sockets with ampere value should be mentioned.
- Warranty: Comprehensive 3 years

9. DIFFERENTIAL GLOBAL POSITIONING - POST PROCESSING AND RTK SYSTEM BY RADIO & 4G LTE WITH WORK STATION

Specification of GNSS DGPS system		
Static DGPS Position accuracy		H: 3mm + 0.1ppm & V: 3.5mm + 0.4ppm
RTK DGPS Position accuracy		H: 8mm + 1ppm & V: 15mm + 1ppm
Static code DGPS Position accuracy		25cm or better
GNSS Base(Reference) Receiver with Integrated Antenna		
1	No of Channels	500+ channels
2	Satellite Signal tracking	System must have facility to track GPS L1,L2, L2C, L5: GLONASS L1, L2, L3: Beidou B1,B2, and Galileo E1, E5a, E5b, Alt-BOC, & QZSS (L1, L2, L5),
3	Correction service/SBAS	SBAS - GAGAN enabled
4	Position update rate	20 Hz or better
5	Internal Memory or Internal Removable Memory	4GB or more
6	Communication device	Integrated **4G LTE** or better cellular network capability & Bluetooth, Radio modem Fully integrated, receive and transmit, external antenna, 1 W output power, with provision to attach High Power Radio
7	Battery	Minimum 6-8 hours operation with single internal battery & provision to attached external Power Source
8	Operating Temperature	Minus 40 degree Centigrade to Plus 65 degree Centigrade
9	Dust & water proof	IP-67 or better
10	Shock proof	Should survive pole drop/topple over from 2 mts
11	Data recording	Facility for recording GNSS data within sensor in OEM format and directly in Rinex format
GNSS Rover Receiver with Integrated Antenna		
1	No of Channels	500+ channels
2	Satellite Signal tracking	System must have facility to track GPS L1,L2, L2C, L5: GLONASS L1, L2, L3: Beidou B1,B2, and Galileo E1, E5a, E5b, Alt-BOC, & QZSS (L1, L2, L5),
3	Correction service/SBAS	SBAS - Gagan enabled
4	Position update rate	20 Hz or better
5	Internal-Removable memory	4GB or more
6	Communication device	Integrated **4G LTE** or better cellular network capability & Bluetooth, Radio modem Fully integrated, receive and transmit, external antenna, 1 W output power, with provision to attach High Power Radio
7	Tilt Compensation	**Calibration-free and Immune to magnetic disturbances tilt measurements using IMU for tilt and heading measurements .**

8	Battery	Minimum 6-8 hours operation with single internal battery & provision to attached external Power Source
9	Operating Temperature	Minus 40 degree Centigrade to Plus 65 degree Centigrade
10	Dust & water proof	IP-67 or better
11	Shock proof	Should survive pole drop/topple over from 2 mts
12	Data recording	Facility for recording GNSS data within sensor in OEM format or directly in Rinex format
Controller		
12	Operating System	Windows embeded handheld/Windows EC or equivalent
13	Processor	1GHz Dual-core A, (RAM) 1GB or more
14	Internal memory/Removable memory	2 GB or more/8 GB or more
15	Battery	minimum 6-8 hours operation with internal battery
16	Dust and water proof	IP-67 or better
17	Display	5 Inch VGA, Graphic display, 640x480 pixel or better, colour TFT
18	Communication devices/ports	USB host, external power & Bluetooth, GSM modem
19	Accessories/attachments	5 megapixel camera with flash, compass, accelerometer, gyro etc.

10. FLOW CYTOMETER SYSTEM

1. The system must be equipped with 3 solid state lasers (405nm Violet, 488nm Blue & 633-642nm Red) having a minimum 10 colors and 12 fluorescence parameter output & field upgradable with more colors. All the lasers & detectors should be fixed aligned for data consistency and reliability on a day-to-day basis.
2. The equipment should have dedicated beam-spots for each laser. All the fluorescence detector channels, and side scatter channel must be designed with photo multiplier tube (PMT) for voltage optimization with stabilized CV & minimal electronic noise contribution for achieving best resolution even for dimly stained population.
3. Pulse Height, Area, and Width information available for all parameters simultaneously to be able to discriminate doublets based on size, granularity & nucleic acid content.
4. Digital signal processing should allow threshold to be set on all available channels simultaneously in any combination of all available parameters during sample acquisition.
5. For high throughput, the analysis speed should be at least 35000 events per second or higher with all the parameters available. The system apart from

offering low, medium & high flow rates, should also offer high sensitivity fluidics aspiration mode, which can result in higher fluorescence signal resolution for dim stained population.

6. The System should have sample carryover of <0.1% or better with cells for rare cell populations discovery and novel marker identification.
7. The system generated compensation should be valid for a minimum of 60days and updated with daily QC. The system software should be able to do single fluorochrome addition to an existing setting from panel of reagents and recalculate the spillover matrix by running a single tube.
8. The system should also allow parallel data acquisition & analysis from two different experiments.
9. This system must be capable of standardization and collaboration between inter-lab/intra-lab through assay portability feature to maintain consistency in data quality.
10. Instrument software must be capable of exporting data as FCS file per population. In addition, system software must allow data overlay of tubes in the same experiment & different experiment.
11. The system should be in a single tube acquisition format & upgradable in future to universal plate and tube loader platform which can accommodate minimum 30/40 tubes rack as well as 96 & 384 well plates directly for complete walk away automation.
12. The system should be offered with suitable and latest workstation (specification must be mentioned) and UPS having minimum of 30minutes back up.
13. Number of electrical wall sockets with ampere value should be mentioned.
14. Should have at least 8-10 recent installations in India of the quoted model in last three years. Bidder should submit at least 5 recent publications using the quoted model from quality journal.
15. Bidder should ensure availability of spares and service for 10 years from the date of installation and commissioning.
16. Multiple on-site training for system & software should be provided.
17. Application and service training should be provided directly from the company
18. Additional high-end research analysis software from FlowJo License should be provided.
19. Warranty:3 year

11. MICRO VOLUME UV-VIS SPECTROPHOTOMETER

- The Instrument should have both Pedestal as well as cuvette sampling option**.**
- The Instrument should have the technology of sample retention that allows a sample to be pipetted directly onto an optical measurement surface. The system should use inherent surface tension to hold micro-volume sample in place during the measurement cycle. Once the measurement is complete, the surfaces are should be wiped with a lint-free lab wipe.
- Wavelength Range: 190-850 nm or better
- Minimum Sample Size: 1.0 µL
- Path length: 0.030 to 1.0 mm auto-ranging
- Light Source: Xenon flash lamp
- Detector Type: 2048-element linear silicon CMOS.
- Wavelength Accuracy: ±1 nm
- Spectral Resolution: <1.8 nm (FWHM @Hg 2 53.7 nm)
- Dynamic range: : 0.2 - 27,500 (ng / µL dsDNA) or better
- Maximum Concentration: 27,500 ng/µL (dsDNA) or better
- Measurement Time: 8 seconds or better
- The system should have the feature of contamination identification & bubble detection to ensure measurement integrity.
- There must internal storage system of the spectrophotometer.
- The system should have high resolution integrated touch screen.
- One pair of quartz cuvette should be included
- System should be offered with two years warranty.
- Stirring for cuvette option: 9 speeds options.
- Software: Software should have feature to identify the contaminants in the sample and report a corrected sample concentration. It should also detect the bubbles and other anomalies in the sample column. Software should provide instant feedback about sample quality with on-demand technical support for guided troubleshooting.
- Application Support : Nucleic Acid A260, A260/A280, A260/A230 and Labelled Nucleic Acids; Protein A280 and A205, Protein Pierce 660, Protein Bradford, Protein BCA, Protein Lowry, Labelled Proteins, OD600, Kinetics, UV-Vis, and Custom Methods.
- Adequate online UPS
- System should be offered with three year warranty.

12. RESEARCH PETROLOGICAL MICROSCOPE WITH IMAGING FACILITY

- Make &Model- Should be mentioned.
- Nose piece- Six position centerable nose piece
- Illumination and contrast management for reproducible results
- Function keys for motorized aperture/ field diaphragm
- Coded conoscopy with 1.6 magnification changer 5X, 10X, 20X, 40X, and 50X
- Analyzer 180 degree rotatable, revolving 180 degree with scale intervals of 5 degree
- Stage Micrometre, Reticule
- Tube Optics1 X/1.6X, Bertand lens and Quartz plate with refracted and reflected light illumination
- LED automatic illumination
- Status display (magnification, resolution, depth, calibration etc.)
- 360 degree rotating stage with and without 45 degree click stop.
- Motorised condenser with motorised top lens.
- Strain-free Optics
- Broad range of Polarisation equipment fixed and variable compensators according to DIN 58879 with manual point counting stage.
- Digital microscope cooled colour camera with CCD, fast live imaging-1280X960 pixel with 18 pfp or better
- Imaging software for microscopy applications in material science
- All optics and hardware should be capable of working in presence of heating stage
- Dust cover
- Appropriate desktop computer with UPS and external CD/DVD writer.
- Warranty-3 years

13. IMPEDENCE ANALYSER

Specification :

- **Measurement modes** –LCR mode, Analyzer mode (Sweeps with measurement frequency and measurement level),Continuous measurement mode
- **Measurement parameters**-Z, Y, θ, Rs (ESR), Rp, Rdc (DC resistance), X, G, B, Cs, Cp, Ls, Lp,D (tanδ), Q
- **Measurement range** --100 mΩ to 100 MΩ, 12 ranges (All parameters are determined according to Z)
- **Basic accuracy**------ Z ±0.08% rdg. θ: ±0.05°
- **Measurement frequency**-- 10 Hz to 5 MHz or more
- **Display**- Colour TFT, display, Size-5 inch or more
- **Measurement time**-- 0.5 ms (100 kHz, FAST, display OFF, representative value)
- **Functions** –
- DC bias measurement, Comparator, BIN measurement (classification), Panel loading/saving, Memory function
- **Interfaces** ---EXT I/O (handler), RS-232C, GP-IB, USB communication, USB memory, LAN
- **Accessories**- Test Fixture Direct Connection Type (DC to 8 MHz), High Temperature Test set
- (600DegC) with stainless Steel sample holder. Vertically shaped pit type Furnace with K type
- Thermocouple, Temperature controlled by very good quality imported Controller, Power rating
- 240VAc, 1.5Kw.

Optional Accessories: Equivalent Circuit Analysis Firmware.

Warranty- 3 years

14. PROTEIN PURIFICATION SYSTEM

- Completely Bio-compatible inert, fully automated modular system to maintain protein integrity and labile post translational modifications.
- System should be capable of running at flow rates ranging from 0.001 – 25 ml/min, isocratic (wash / column packing) is 50ml/min.
- The system should be capable of accurate, automatic gradient formation from 0 to 100% gradient over the entire flow range of 0.1 to 20 ml/min or better.
- The system should be compatible with variable volume size mixer chamber to ensure homogeneous buffer composition during gradient runs.
- System should have the capability of running with automatic pressure control option enabling to modulate the flow rate upon reaching the set pressure and continue the run without pausing the system.
- System should operate in a pressure range of 0 – 20 MPa with an accuracy of +/- at least 1.5%.
- The system pump should have Sapphire coating to tolerate up to 8M Urea and 6M Guanidine Hydrochloride.
- The UV-monitor should be able to detect up to three wavelengths between 190 – 700nm simultaneously without change in light source.
- System detector should be a flash lamp xenon and does not require any warm up or heat up time to avoid possible degradation of samples. Lamp must be automatically switched off in stand-by mode. Optical fiber based light delivery to the detector for high signal to noise ratio.
- System UV detector should have an absorbance range at least -6 to +6 AU crucial for sharp peaks. Useful for samples which give reading in the negative spectra of the absorbance.
- System should have optical path length of 0.5 mm, 2 mm, and have the option of changing the path length to 5mm and 10 mm.
- System should be supplied with a column valve so as the system could run in bypass mode without removing the column.
- The system should come pre-assembled with predefined tubing.
- System should be supplied with a conductive monitor for conductivity measurement between 0.01ms/cm up to 999.9 ms/cm. System should be supplied with automated temperature compensation and flow restrictor.

The system should be supplied with a fraction collector. Minimize spillage using Drop Sync sensor and allows collection of up to 350 fractions and use of 3, 8, 15 and 50 ml tubes. Fraction collector can be used in time, volume or peak recognition mode.

- The system should have capability to be integrated with third party Detectors like fluorescence, IR etc detectors simultaneously for increased application flexibility at the time of purchase or post-purchase.
- The system should be able to work on a single control software platform with full networking capabilities and scalable from lab to production scale.
- The system should have the capability to track column usage and performance.
- The system should come with a Software control with Method Queues resulting in attending operations.
- Watch functions should be included in the system .
- The system should be capable of being installed with integrated DoE as a tool for experimental design for generating precise data in fewer experiments for time and cost efficient method development.
- System and Software are fully GLP/GMP compatible, 21 CFR part 11 : Software offers electronic signature according to 21 Code of Federal Regulations Part 11.
- Warranty of three years from date of installation and commissioning.
- Sample loops of sizes 500µL and 5ml to be provided.
- Demonstration and onsite training for 3-4 times during warranty period as and when required should be given free of cost.
- A pre-packed column with a bed volume of 120 ml of cross-linked agarose and dextran (bead size 34 µm) matrix and hydrophilic nature to minimizes nonspecific adsorption and maximizes recovery with broad range of fractionation (Fractionation range 3,000-70,000 Da). The resins should be stable to commonly used aqueous buffers, 1 M acetic acid, 8 M urea, 6 M guanidine hydrochloride, 1% SDS, 2 M NaCl, 20% ethanol, 30% propanol, 24% ethanol, 30% acetonitrile, 0.1 M hydrochloric acid, and autoclavable for 20 min at 121°C in 0.15 M NaCl pH 7, 5 cycles (resin only).
- A pre-packedcolumn with a bed volume of 24 ml of cross-linked agarose and dextran (bead size ~8.6 µm) matrix and hydrophilic nature to minimizes nonspecific adsorption and maximizes recovery with broad range of fractionation (Fractionation range 10,000-600,000 Da). The resins should be stable to commonly used aqueous buffers, 8 M urea, 6 M guanidine hydrochloride, 2% SDS, 2 M NaCl, 20% ethanol, 30% propanol, 24% ethanol, 30% acetonitrile, and 0.1 M hydrochloric acid.

- The system should be offered with suitable and latest workstation (specification must be mentioned) and UPS having minimum of 30 minutes back up.
- Number of electrical wall sockets with ampere value should be mentioned.
- A compatible cold chamber to be provided.
- Warranty of minimum 3 years from the date of installation and commission should be provided.

15. ICE FLAKING MACHINE

- Capacity: Up to 104 kg of flake ice production per day
- Storage bin capacity: 30 kg built-in ice storage
- Fully electronically controlled operation, with self-diagnostic
- functions with external alarm lights providing operational
- Information for early alert and fast diagnosis of operating issues
- External components constructed from corrosion-resistant stainless
- Steel material crafted for optimal aesthetic
- Appeal through superior fit and
- Finish compatible with ice
- The Bin covered with good quality cover
- Disappearing storage bin door
- CFC Free R-134a Refrigerant
- Voltage Options:230/50/1
- Load (watts): to be mentioned
- Warranty -3 years

16. AUTOCLAVE

- **Double wall design** should have single chamber for steam and water. Inner chamber is of 2 mm thickness and is made of stainless steel; outer cover is also made of stainless steel. Lid and flange are made of thick stainless steel.
- **Operation Fully automatic** cycle begins at the press of start button.
- **Air purging cycle:**
- The valve should automatically shut after steam pressure builds up.
- An inbuilt timer which is operator programmable can be adjusted as per
- Sterilization load requirement. The timer should operate at the moment, when the required sterilization temperature and pressure is achieved and precisely maintains the required time.
- Cycle end steam exhausts once sterile time period is complete the steam is automatically exhausted.

TECHNICAL SPECIFICATION

- Temperature range: 121 to 134°C
- Temperature resolution: 0.1 °C
- Temperature accuracy: +0.5 °C
- Temperature sensor: PT100 RTD Class 'A'
- Temperature Control: Microprocessor based
- Digital display
- Temperature Display: LCD back lit display
- Pressure range: 10 to 30 PSI, factory set at 15 PSI. Can be set at any temp.

- Pressure display: Dial gauge 0-50 PSI
- Timer: In-built digital timer1-99 minutes
- Lid locking arrangement above 80°C
- Pressure resolution 1 PSI
- Electrical 230V / 15A / 50 Hz.
- Pressure Safety high pressure release valve
- Temperature Safety high temperature cut off.
- Low water level cut-off
- Electric Circuit Breaker
- Calibration & Validation
- Calibration Temperature sensor probe calibration with traceability to ERTL
- Temperature controller calibration with traceability to ERTL.
- Validation IQ, OQ and PQ documentation and protocols shall be provided with equipment.
- SIZE: 35 X 55 CM (working chamber)
- Capacity: 52 Ltrs or more.
- To be supplied with S.S. wire mesh basket
- Safety controller: to be provided, which can be set 2°C above the set temperature for safety and will cut-off the heater with audio-visual alarm.
- Comprehensive warranty of 3 years should be provided.

17. HIGH TEMPERATURE MUFFLE FURNACE

- Max working temperature: 1800^{o} C
- Heating elements: MoSi2
- Temperature control: Programmable and PID auto control
- Cooling: Cooling fan can reduce the temperature
- Max heating rate: 200 ^{o}C/min
- Temperature Uniformity: ±5^{o}C
- Furnace Chamber: Ceramic with ultra high temperature coating inside
- Alarm: With over temperature alarm function
- Voltage: AC 220 V or 440 V
- Temperature Accuracy: ±1^{o}C
- Heating element switched via thyristors
- Optional: PLC with Color HMI (data logging & USB Interface)
  RS485 with PC interface
  Door safety switch
  Silicon carbide bottom plate
- Super Kanthal Molybdenum Di silicide (MoSi2) heating elements (2 Nos.)
- B type duplex thermocouple (1 No.)
- Warranty- 3 Years

18. DESKTOP COMPUTER & PRINTER CUM SCANNER

(A) Desktop computer i5

- Processor: 12th Generation Intel® Core™ i5-12400 (18 MB cache, 6 cores, 12 threads, 2.50 GHz to 4.40 GHz Turbo)
- Operating System Windows 11
- Video Card Intel® UHD Graphics 730
- Memory 8 GB, 1 x 8 GB, DDR4, 3200 MHz
- Hard Drive 512 GB, SSD
- Microsoft Office pre loaded
- Security Software quick heal 3 years
- Support Services 3 Years Basic Onsite Service
- Keyboard
- Mouse (Cordless)

Ports

Front:

Optical Disk Drive (Optional, USB)
2 USB 2.0 ports
2 USB 3.2 Gen 1 ports
1 Global headset jack
1 SD-card reader

Back:

2 USB 2.0 ports with Smart Power
2 USB 3.2 Gen 1 ports
1 Audio line-out port
1 RJ-45 Ethernet port
1 HDMI 1.4b port
1 Display Port 1.4 port

Slots

1 SATA 3.0 ports
1 SATA 2.0 ports
1 PCIe x16 half-height slot
1 PCIe x1 half-height slot
1 M.2 2230 card slot for WiFi/Bluetooth combo card
1 M.2 2230/2280 card slots for solid-state drive

- Wireless –Wi Fi and Bluetooth enabled
- Optional item- external hard disk 4tb lacie
- UPS: 1 KVA with 4X Indian 3-pin 6 Amp outlets (Preferably APC / V-Guard / Luminous); **rates to be quoted separately**.

(B) DESKTOP COMPUTER i7

- Processor: Core i7 10th Gen, 11700K
- Motherboard- Intel B560 Chipset
- Memory: 16GB (8GBx2) RAM expandable to 64GB
- Hard disk drive: 512GB SSD
- Optical Drive: External, USB

- Graphics: Nvidia Geforce RTX 3060 12GB Graphics
- Audio: External
- Ethernet: Integrated Intel Gigabit & in built Wi fi
- Ports: VGA, Display port/HDMI, RJ-45, USB front & back
- Power supply: 600-650 watt
- Keyboard/Mouse: Wired keyboard, Optical & Wireless mouse
- Operating system: Window 11 with MS-Office(2019/2021) preloaded
- UPS: 1 KVA with 4X Indian 3-pin 6 Amp outlets (Preferably APC / V-Guard / Luminous); **rate to be quoted separately**.
- Warranty

(C) Monitor for PC

- Screen size- Borderless 27 inch, LCD flat panel
- Port – 2 HDMI 1.4 , 1 Audio Line out
- Screen resolution -1920 x 1080 pixels
- Panel – IPS panel
- Sound – Built-in speakers
- Warranty -3 years

(D) Laserjet printer duplex with scanner

- Print, Copy, Scan, Self Reset Dual Band WiFi
- Connectivity – Wifi , USB
- Compatible devices – Smart phones
- Printer output – Monochrome, duplex , A4
- Recommended for Office uses
- Print speed – 22 ppm
- Warranty – 1 year

(E) Inkjet Printer (All in One)

- Wi –Fi Multi Function,Print, copy, Scan
- Print speed – 10ppm(A4)/5ppm(colour)
- Resolution – Print 1200 x 1200 dpi B/W , 4800X1200 dpi colour
- Ink tank model
- Additional function – ID copy , receipt copy
- Transparent sheet printing
- Wi fi /Direct/ USB
- Warranty – 1 year

19. CAMERA & ACCESSORIES

(A) Camera 1 (Full Frame Mirrorless sensor)

- Resolution: 30 MP or above
- Auto Exposure Bracketing: More than 6 Steps
- Connection Type: Microphone, USB
- Continuous Shooting Speed: 10 frames per second
- Optical Viewfinder Field Coverage: 100%
- Focus Adjustment: Auto
- Lens Mount
- Exposure Mode: Aperture-priority, Automatic, Manual, Shutter-priority
- White Balance Presets
- Digital Video Format
- Image Recording Format
- Memory Card Type
- Max Video Resolution: 3840 x 2160
- Video Input High-def

(B) Camera 2

- Camera body – DSLR
- Sensor – 20- 30 full frame sensor.
- Resolution: 6016 x 4016
- Native ISO Sensitivity: 100-12,000 or more
- Dust Reduction: Yes
- Weather Sealing/Protection: Yes
- White Balance: Complete with presets
- Shutter: Up to 1/4000 and 30 sec exposure
- Card slot
- Autofocus System
- LCD Screen: tilting
- Movie Modes: Full 1080p HD
- Movie Exposure Control: Full
- HDR Capability: Yes
- Battery Type

(C) Camera Lenses

- Professional and Consumer lens to be quoted compatible with the quoted model of the camera.
    - 16-35 mm – f 2.8
    - 24-70 mm – f 2.8
    - 24-105 mm – f 4
    - 70-200 mm – f 2.8
    - 50 mm – f 1.2

(D) Camera Accessories

- Memory card- SD/SDHC/SDXC (UHS-I and UHS-II) 128GB with 5 year warranty
- Professional flash gun
- Camera bag(Backpack with rain cover)
- Professional camera stand
- External hard disk – 4TB preferably Lacie
- Dry Box – 140 L ,200L or above
- Handheld Gimbal
- Remote shutter release
- Camera strap for professional camera
- Polarizing filter
- Memory card reader
- Spare batteries
- Professional microphone with camera mount option for two people.
- External monitor cum recorder.
- Extra Battery for camera
- Compatible shooting grip
- Camera mount Microphone wireless- 100mtr range with variable channel and band width

(E) Video Camera & Accessories

(1) Camera GoPro Hero 10 MP Action Camera

Type- CHDHB-501-RW, Hero (with Shorty & Chesty)

- Sensor Type-CMOS
- Display-Touch Display
- Camera Resolution-10 MP
- SanDisk Extreme 128 GB.
- Small GoPro Case.
- GoPro 3 Way Mount Tripod.
- GoPro Super Suit.
- GoPro Chesty Performance Chest Mount.
- GoPro Dual Battery Charger & Battery.
- Waterproof Floating Hand Grip.
- Light Mode.
- Extra Battery to be quoted (optional)
- Warranty: 1 Year

(2) Video Camera

- Make & Model: Should be mentioned
- Card Reader: SDHC, SDXC
- Standing screen display size: 0.24 Inches or better

- Image Stabilisation: Optional
- Optical Zoom: 12 x
- Max Resolution: 14.2 MP
- Video Capture Resolution: 4K
- Batteries Included: Yes
- Auto Focus: Yes
- Remote Control: Optional
- Extra Battery to be quoted (optional)
- Accessories: Carrying bag; tripod; monopod
- Warranty: 1 year

20. DEHUMIDIFIER

- Electronic setting, auto restart facility and setting of programme
- Air Flow: 145 m^3/hr
- Extraction (l/24hr) (30°C, 80% RH): 20L, Running temp., 5°C – 35°C
- Coverage for dehumidification: 2500-3500 cu.Ft.
- Power consumption: should be mentioned
- Power supply:220V-240V/50Hz
- Tank Capacity: 6.5L having rotary compressor
- Refrigerant: as per present norm.
- Warranty: 1year

21. DIGITAL BALANCE

- Make & Model: Should be mentioned
- Type - Analytical
- Wind shield, Backlist LCD
- Display with tare and calibration facility, compatible interface, weighing hook, AC adapter (to be mentioned).
- Stainless steel platform with size at least 5”X5”.
- Weighing resolution: 220gm, capacity X 0.001mg
- Warranty - 3 years from the date of installation. Additional warranty period for 2 years may be quoted separately.
- Prompt service support – Spares should be available at least for 10 years.

22. UV-VIS SPECTROPHOTOMETER WITH DIFFUSE REFLECTANCE

Specifications:

Main System: UV-VIS Spectrophotometer with PC, Printer, and Analysis solution software

• Photometric system; Double beam optics: Single monochromator/double monochromator

• **Wavelength Range:** 200-1100 nm or better

• **Lamp Source:** Xenon flash lamp/**Tungsten and Deuterium Lamp**

• **Detector: Silicon Photodiode/PMT**

• **Spectral Bandwidth: 0.5 – 5.0 nm or better with variable interval**

• **Wavelength Accuracy/ Reproducibility: Accuracy: ± 0.1 nm or better for whole wavelength range/ ± 0.1 nm or better**

• **Photometric Absorbance: Absorbance: ± 4 Abs or better**

• **Accuracy, Noise, and drift: Accuracy: ± 0.01 Abs or better; Noise: < 0.00005 Abs or better; Drift:< 0.0003 Abs/h or better**

• **Baseline flatness: ± 0.0005 Abs or better**

• **Stray light: < 0.02% or better**

• Cell (Cuvette): 10 mm optical path length, sample volume 2.5 to 3.5 mL: Quartz (4 Nos.); Glass (4 Nos) and 1.0 mm optical path length, sample volume 0.30 to 0.50 mL: Quartz (4 Nos.); Glass (4 Nos).

• **Solid Sample Holder:** 02 Nos.

• Power: 220 to 240 V, 50/60 Hz

• Computer and Printer:
Branded PC with latest configurations (Core- i5, 4GB RAM, 1TB HDD, 19″ LED Monitor, DVD Writer) and Laser jet printer.

• Suitable online UPS with 30 minutes back-up to run the instrument and computer

Warranty:

• Minimum 03 years warranty

Essential accessories

• **Reflectance Accessory: Diffuse reflectance attachment for solid sample spectral studies in the range of 250 to 1100 nm or better**

• **Barium sulphate : Spectroscopic grade barium sulphate – 500 gm**

Optional Accessories

Peltier system: Temperature controlled cell holder (Peltier system) for control of temperature of liquid samples at multiple temperatures with temp. Range: 0 to 100°C; temp. Accuracy: **± 1 to 2 % of set temp. Value**

23. ROTARY EVAPORATOR WITH VACUUM PUMP AND CHILLER

Specification of Rotary evaporator

- DC brushless motor drive with speed range of 20-280 rpm or more.
- Digital control of heating bath and drive rotation speed
- 1500 cm^2 or larger cooling surface area for better recovery rate
- CW & CCW Rotation with interval option for faster powder drying
- Motorised lift with safety stop function
- Timer function and RS 232 interface for software connectivity
- Heating temperature range of RT to 180˚C for water and oil bath application
- Bath capacity of 3 litres or more.
- Heating bath should have heat control accuracy of ±1 K or less
- Safety temperature circuit and Dry Run protection of heating bath
- Locking function of heating bath for avoiding accidental changes of settings
- Heating bath can be used as standalone unit for different applications

Vacuum pump

- Two stage diaphragm pumps made of PTFE for protection against aggressive solvents Transparent front cover for detection of solvent build up
- Suction capacity or flow rate of1.8 m3/h or more.
- Ultimate vacuum level should be equal or less than 7 mBar.
- Dial gauge vacuum regulator for vacuum control.

Chiller

- Temperature control room temperature to -20°C.
- Bath volume should be 3 L or more.
- Flow rate should be 17 L per minute or more.
- Display resolution should be 0.1°C and stability of 0.5°C.

Warranty: 03 years on Rotary evaporator, vacuum pump and chiller.

24. ONLINE UPS

(A) 3 KVA Online UPS

- Capacity 3KVA/2700 watt or better
- Input Voltage Range – 160 to 270 VAC
- Output Voltage Range- 230 VAC, Output Voltage factor 0.9 or better
- Pure sine wave with built in Isolation transformer
- Microprocessor controlled
- Backup -30Minutes, 60 minutes (to be quoted separately for 30minutes backup and 60 minute backup)
- Audio signal- for battery mode, low voltage and fault
- Battery for the Ups- to be quoted according to back up timeMulti line Display
- Protection Mechanism- Protection against short circuit, Overload, Surge and Overheat
- Cooling Fan provision for internal unit
- Battery –Tubular,SMF, 150 AH minimum, life expectancy 4 years
- Battery charger-6.5 Amp or higher
- By pass facility
- Warranty – Minimum 2 years or more
- Installation- All materials required for installation should be inclusive

(B) 5 KVA Online UPS

- Capacity –5KVA/4000 watt or better
- Input Voltage Range-230voltsingle phase
- Output Voltage Range- 230 VAC, Output Voltage factor 0.9 or better
- With built in Isolation transformer
- Microprocessor controlled
- Backup -30Minutes
- Audio signal- for battery mode, low voltage and fault
- Battery for the Ups- to be quoted according to back up time
- Multi line Display
- Protection Mechanism- Protection against short circuit, Overload, Surge and Overheat
- Cooling Fan provision for internal unit
- Battery –Tubular,SMF, 150 AH minimum, life expectancy 4 years
- Battery charger-6.5 Amp or higher
- By pass facility
- Minimum – 2 years or more
- Installation- All materials required for installation should be inclusive

(C) 10 KVA Online UPS

- Capacity – 10KVA/8000 watt or better
- Input Voltage Range- 350/400/415VAC 3 phase
- Output Voltage Range- 230 VAC, Output Voltage factor 0.9 or better
- With built in Isolation transformer
- Microprocessor controlled
- Backup -30Minutes
- Audio signal- for battery mode, low voltage and fault
- Battery for the Ups- to be quoted according to back up time
- Multi line Display
- Protection Mechanism- Protection against short circuit, Overload, Surge and Overheat
- Cooling Fan provision for internal unit
- Battery –Tubular, SMF, 150 AH minimum, life expectancy 4 years
- Battery charger-6.5 Amp or higher
- By pass facility
- Minimum – 2 years or more
- Installation- All materials required for installation should be inclusive

All the Online UPS must be Suitable seismically stable, durable, rust proof rack for mounting the batteries and UPS shall be supplied along with the system and the supplier is responsible for installation of the rack and batteries including testing of the UPS system.

25. PORTABLE SOUND SYSTEM

- Make & Model: Should be mentioned
- Type of Product: PA Speakers
- Input Power: 50W
- Output Power: 50W Max. (LF+HF) LF: 35W Max HF: 15W Max
- Tone Control: Bass ±5dB at 100Hz, Treble ±5dB at 10kHz
- S/N Ratio: 60dB
- Frequency Response: 55-18,000Hz ±3dB (Bi-Amp)
- Power Supply: AC: 220V-240V 50/60Hz, DC : 12V Car Battery (external), 12V 7Ah Rechargeable battery (built-in)
- Digital Player: MP3 player with USB, SD, MMC card reader, Recording function and Bluetooth
- Input Channel: 2 x Mic 3mV/4.7kΩ, 1 x Aux 100mV/47kΩ, Music 100mV/47kΩ, 2 x Wireless MIC
- Protections: AC Fuse: 1 Amp. 250V (T 1A L)
- Speaker: 1x12" Speaker, 1xHF Driver
- Warranty: 1 year

26. AIR CONDITIONER, STABILIZER, REFRIGERATOR & DRINKING WATER PURIFIER

(A) Air conditioner (1.5 ton split type)

- Compressor – Inverter type
- Energy rating – 3-5 star rating
- BEE rating-2021
- 100 % copper condenser
- Operation mode – Auto mode, dry mode, fan mode, turbo mode, sleep mode.
- COP (Coefficient of Performance) to be mentioned.
- Filtration system – Dust filter, Anti bacterial
- Outdoor unit mounting bracket – Inclusive
- Ambient temperature – 50^{o} C
- Dehumidification – Yes
- Warranty – 3years on product or more, 5 years on compressor
- Installation – Free standard installation
- Standard Installation of Split AC Covers:-
  1. Drilling of hole in Brick wall for taking out the pipes
  2. Fixing hole sleeve & Cap
  3. Fixing the Indoor and Outdoor Unit.
  4. Connecting Indoor and Outdoor units using Standard Kit provided by Manufacturer (at an additional cost, unless specified otherwise).
  5. Wrapping the pipe with seasoning tape.
  6. Connection to Stabilizer or Power point in the range of Power Cord Provided by Manufacture.
  7. Temperature /Performance Check & Demo and Maintenance tips filling the details in warranty card.

- Extra copper wire, Drain Pipe extension if any, to be quoted extra. Wiring extension to the site, Power point/MCB fitting and any other electrical work to be quoted extra.

(B) Stabilizer for 1.5 ton split AC

- Make , Model should be mentioned
- Energy star rating
- Wattage
- LED indicator display, Wall mount type
- Input range – 130-280V, Low & high cut off, Overload protection
- Copper winding coil, with surge & spike protection
- Warranty – 3 years

(C) **Refrigerator**

- Double door, Stabilizer free model
- Energy rating – 3-5 star rating
- Defrost type – Frost free
- Compressor – Inverter type
- Capacity – 250 liters or above

- Warranty – 3 years on product and 5 years or more on compressor

(D) **Drinking Water Purifier**

- Type of Product: Water Purifier
- Model: 50 LPH Storage
- Purification Capacity: 50 LPH
- Storage Capacity: 50 Litres
- Power Consumption: 75 Watt
- Voltage: 230 V AC
- Weight: 75 Kg
- Membrane Type: RO
- Dimensions (L x W x H): Should be mentioned
- Type: Storage

27. SMOKE AND FIRE ALARM SYSTEM

Wireless IP based Fire Detection System

Specifications

- Supply and engineering of IP based wireless addressable alarm panel, STQC (Govt. of India) approved, 01 loop & built in auto dialer with voice help message, built in voice message announcement in case of fire, built in hooter & battery back-up on panel board for 24 hours etc.
  Make: Textile
- Supply and engineering of wire free addressable sensor, powered by standard AA Battery, resettable by panel, STQC (Govt. of India) approved.
  Make: Textile
- Supply and engineering of wire free addressable manual call point, integrated in red plastic housing, tamper proof design, resettable by keys, STQC (Govt. of India) approved.
  Make: Textile
- Supply and engineering of hooter cum strobe light, integrated in red colour strobe light for panel.
  Make: Textile
- Supply and engineering of CO2 fire extinguisher of capacity 2 KG for emergency operation.
  Make: Fireshield
- Supply and engineering of TC software integration of FDA Panel.
  Make: Textile
- Warranty- 3 years from the date of Installation

28. CCTV

(A) 5 MP Indoor Fixed Lens Dome Camera

Make: Hikvision/Dahua / Panasonic/Infinova

- Image Sensor: 1/2.7" Progressive Scan CMOS or better
- Min. illumination: Colour: 0.003 Lux @ (F1.4, AGC ON); B/W: 0 Lux with IR or better
- Image Resolution: 5 MP (2592 × 1944)
- Day & Night: IR Cut Filter
- Shutter speed: 1/3 s to 1/100,000 s or better
- Digital Noise Reduction: 3D DNR
- WDR: 120dB True WDR
- Lens: 2.8mm
- IR range: minimum 40m IR or better
- Streaming Type: Should Support Quad stream or better
- Video Compression: H.265, H.264, H.265+, H.264+
- Image Enhancement: BLC, HLC, 3D DNR, 120dB WDR, ROI or better
- Image settings: Rotate mode, saturation, brightness, contrast, sharpness, gain, white balance adjustable by client software or web browser or better
- Ethernet Port: 1 x RJ45 10M/100M Ethernet port or better
- Network Protocol: TCP/IP, ICMP, HTTP, HTTPS, FTP, DHCP, DNS, DDNS, RTP, RTSP, NTP, UPnP, SMTP, IGMP, 802.1X, QoS, IPv4, IPv6, UDP, SSL/TLS, PPPoE, ARP, SNMP
- Edge base Recording: Micro SD/SDHC/SDXC card (256 GB) local storage, and NAS (NFS, SMB/CIFS), auto network replenishment (ANR)
- Preferable analytics: Face Capture, Line crossing detection, intrusion detection, region entrance detection, region exiting detection, unattended baggage detection, object removal detection, scene change detection, audio exception detection
- Basic Event: Motion detection (human and vehicle targets classification), video tampering alarm, exception
- General: Anti-flicker, heartbeat, mirror, privacy mask, flash log, and password reset via email, pixel counter
- Power Supply: 12 VDC, PoE (802.3af, 36 V to 57 V), or better
- Certificate: CE / UL / BIS / FCC

(B) 5 MP Outdoor Fixed Lens Dome Camera

Make: Hikvision/Dahua / Panasonic/Infinova

Details

- Image Sensor: 1/2.7″ Progressive Scan CMOS or Better
- Min. illumination: 0.003 Lux @ (F1.4, AGC ON), 0 Lux with IR on or Better
- Image Resolution: 5MP (2592 × 1944)
- Day & Night: IR Cut Filter
- Shutter speed: 1/3 s to 1/100,000 s or Better
- Digital Noise Reduction: 3D DNR

- WDR: 120dB True WDR
- Lens: 2.8mm / 4mm / 6 mm / 12 mm (as per site requirement)
- IR range: minimum 90m IR or better
- Streaming Type: Should Support Quad stream or better
- Video Compression: H.265, H.264, H.265+, H.264+
- Image Enhancement: BLC, HLC, 3D DNR, 120dB WDR, ROI, EIS, Defog
- Preferable analytics: Face Capture, Line crossing detection, intrusion detection, region entrance detection, region exiting detection, unattended baggage detection, object removal detection, scene change detection, audio exception detection, video quality diagnosis
- Basic Event: Motion detection, video tampering alarm, exception (network disconnected, IP address conflict, illegal login, HDD full, HDD error)
- Power Supply: 12 VDC, PoE (802.3at, 42.5 V to 57 V), or Better
- Certificate: CE / UL / BIS / FCC

(C) 64 Channel Network Video Recorder (NVR) with 8-HDD Slot

Make: Hikvision/Dahua / Panasonic/Infinova

Details

- Operating System: Embedded LINUX
- IP Camera Input: 64 channels
- Two-way Talk: Should Support
- Audio output: 2-ch
- Display Interface: 2-HDMI, 2-VGA output for viewing
- Display Resolution: **HDMI-1 (4K)** : 3840×2160, 1920×1080, 1280×1024, 1280×720, 1024×768; **HDMI-2** : 1920×1080, 1280×1024, 1280×720, 1024×768; **VGA-1 & VGA-2** : 1920×1080, 1280×1024, 1280×720, 1024×768
- Network Throughput: Incoming Bandwidth: 320Mbps; Outgoing Bandwidth: 256Mbps
- Support multiple brands: Should Support Multi-brand (Onvif) network cameras
- Recording Video Compression: H.265+, H.265, H.264+, H.264
- Recording Resolution: 12MP, 8MP, 6MP, 4MP, 3MP, 1080P, 720P, 4CIF, D1
- User Interface: GUI
- Motion Detection: Should Support
- Alarm In/ out: It should have 16-Ch In and 4-Ch Out
- RAID: Should support RAID 0/1/5/6
- Hard Disk: 8 SATA interfaces supporting hot-plug. HDD capacity : Up to 10 TB capacity for each disk
- eSATA: 1x eSATA interface
- Network Ethernet: 2x RJ-45 ports (10/100/1000Mbps)
- USB: 3x USB ports
- Certification: CE, FCC, UL, BIS

(D) 10 TB Surveillance grade HDD
Make: SEAGATE/WD/TOSHIBA
Details
10 TB HDD, 3.5",SATA, Surveillance Grade

(E) 24 Port POE with 4 fibre optical ports with SFP module
Make: CISCO/D-Link/Hikvision
Details

- POE port: 20 × gigabit PoE ports, 4 × gigabit Hi-PoE ports
- Uplink Ethernet Port: 2 × gigabit RJ45 ports or better
- Uplink SFP Port: 4× gigabit fiber optical ports with SFP module populated of same make
- Standard: IEEE 802.3, IEEE 802.3u, IEEE 802.3x, IEEE 802.3ab, and IEEE 802.3z or better
- PoE port: Ports 1 to 24
- PoE power budget: 370 W or better
- Max.Power per port: Ports 1 to 4: 90 W; Ports 5 to 24: 30 W
- Protection Level: 6 KV surge protection
- Power supply: 100 to 240 VAC

(F) LCS3 24 Port Tool less Patch panel
Make: COMMSCOPE/D-Link/TYCO
Details
LCS3 24port tool less Patch panel& termination of UTP cables on patch panel with wire manager
(G)Supply and laying of CAT 6 UTP Cable
Make: COMMSCOPE/D-Link/TYCO
Details

- Supply & laying of Cat 6A cable
- Cat 6A, TIA/EIA 568-A/B. UL Certificate should be submitted.

(H)55" 4K Display Unit
Make: LG/SONY/SAMSUNG

- 55" 4K Display
- 400 NITS
- Resolution: 3840*2160
- WebOS-based High Performance, Signage model

(I)12U Wall Mount Rack
Make: VALRACK/D-Link/Netgear

- Network Distribution RACK 12U 19" 600 mm depth with PDU, Cable Manager and FAN

(J)CAT6A 1 meter Patch cord
Make: COMMSCOPE/D-Link/TYCO

- Cat 6 1 Meter Patch Cord

(K)UPS 1KVA online with in-built battery
Make: APC/Delta/Numeric

- Output power capacity: 800 Watts / 1.0 kVA Max
- Output Connections: (4) India 3 pin 6A (Battery Backup)
- Bypass: Built-in Bypass Nominal
- Input Connections: India 3 pin 6A
- Input voltage range: for main 100 - 280 (half load) V
- Smart-Slot Control panel LED status display

(L)PVC Box for fitting of cameras

- Suitable PVC box and Junction box for installation of all cameras

(M) Supply and laying of 4 core optical fibre armoured cable
Make: COMMSCOPE/D-Link/TYCO/Finolex

(N)Splicing and jointing of OFC Cable with all accessories
Splicing and termination of Optical fibre cable with Patch cord, pigtail and Ring structure

(O)12 Port LIU
Make: COMMSCOPE/D-Link/TYCO/Finolex

(P)Supply and laying of PVC Pipe
Supply and laying of 20mm/25mm ISI certified premium quality Fire resistant PVC Pipe with bend, jointing and no use of flexible for laying of cable with proper clamping

(Q)ITC with 3 Years warranty
Installation, Testing, Commissioning and Training of the Surveillance system with 2 years' service and support

(R) Certificates
OEM Authorization Certificate

29. LABORATORY FURNITURE& FIXTURE

Sl. No.	Item with specification	Reference image
A	**Laboratory alunimiumPartition** • Powder coated aluminum section of 2 ½ x 1 ½ inch for partition repeatable in 3 feet horizontally. • From bottom up to 3 ½feet ACP panel of 4mm thickness then 3 ½ feet clear glass of 5 mm thickness. Rest up to ceiling ACP panel of 4mm thickness. • Door section should be of 4 inch wide. All doors should have automatic door closer, door handle, aluminum door bolt, 8 inch tar bolt and stopper. • All doors should be fitted with air tight mechanism/gadgets. The upper portion of the door should be of clear glass of 5mm thickness. • All ACP panel and glass panel should be fitted with proper insulation. **FITTINGS** • ACP panel of Alstrone, Aludecor, Alucobond, Eurobond • Door hinges, Door closer should be of Dunex, Hettich, Magnum, Gordrej, Kich. • **Rate of the partition is to be quoted in sqft.**	
B (Type 1)	**Laboratory stool** • Material: High quantity Stainless Steel frame with padded seat. • Height – 26 inch • Diameter – 14 inch • Leg- rubber padded	

B (Type 2)	**<u>Laboratory stool 2</u>** • Height – 26 inch • Top – 12 X 12 inch • Frame – Stainless steel heavy duty • Item shape – Square	
C	**<u>Laboratory table for Centrifuge</u>** • Dimension- 4ft x 2.5ft x 2.5ft (L x B x H) • Metal frame of 1.25 inch square bar hollow frame duly painted with powder coated paints. • Top 19mm ply section termite proof marine ply preferably of make Century / Austin Ply/ / Kitply / National ply / Green ply • Top lamination 1 mm of Century/Marino/Green brand • Warranty – 1 year	
D	**<u>Laboratory table multi purpose</u>** • Dimension- 3ft x 2ft x 2.5ft (L x B x H) • Metal frame of 1 inch or 1.25 inch square bar hollow frame duly painted with powder coated paints. • Top 19 mm termite proof marine ply preferably of make Century / Austin Ply / Kitply / National ply / Green ply • Top lamination 1mm Of Century/Marino/Green brand • Heavy duty 360 degree rotating wheel on legs. • Warranty – 1 year	

E	**<u>Laboratory Work Bench (Wall side table)</u>** • Laboratory wall side table consists of 1 ¼ inch heavy gauge hollow square frame (Jindal pipe/Tata) for legs and horizontal frame sections of the table. • One unit length is 5.5 ft x 2.5ft x 3 ft (L x B x H). In each unit there should be one storage unit cupboard made up of 19mm marine grade termite proof ply laminated by 1 mm of Century/Marino/Green brand • All frameworks should be welded at the joints properly painted with powder coated paints and the legs should have labeling screw. • Over the framework 12mm ply section painted with enamel will be fixed. Over the ply, 18-20 mm jet black granite plate will be fixed. The granites are needed to be moulded at the edges. • The unit length of 5.5 ft x 2.5 ft x 3 ft (L x B x H) will be repeated in the entire length of the laboratory and the quoted rate should be running ft in the length. • Under structure – Cupboard-cum-Drawer: H X W X D = 28 X 24 X 30 inches; with handle, 1 adjustable shelf • Sink and faucet – Bench mounted 3 way water faucets with 8" gooseneck suitable for laboratory and ceramic sink to be quoted extra. The water connection to the faucet from the existing water line and drainage of the waste water is to be quoted extra as per running meter; sink dimension (L X W X H) 24 X 19 X 7.5 inches (approx.). • Electrical connection on the wall with 15 A plug sockets and 6 A sockets are to be done on turnkey method. Wiring of the lab benches to be quoted extra as per running	

	meter.	
F	**<u>Wall Cabinet</u>** • Dimension: (H X W X D) 30 X 24 X 14 inches • 19 mm marine grade ply, termite proof, preferably of make Century / Austin Ply / Kitply / National ply / Green ply • Lamination: Inner side 0.7mm, Outer side 1mm. • Soft closing auto hinges • Hinges & Lock- Godrej / Hettich • Handle- Stainless steel • No of shelves - 2	
G (Type 1)	**Ladder(Step Ladder)** • Foldable Product heavy duty • Anti skid design for better grip • Weight holding capacity (kg): 150 kg • Closed size:- (L) 9 cm x (B) 48 cm x (H) 194 cm • Opening size:- (L) 99 cm x (B) 48 cm x (H) 180 cm	
G (Type 2)	**Collapsible, Telescopic ladder 20 feet – Heavy duty** • Made with best in class aerospace engineered 6063 T5 grade of aluminium alloy with 1.5 mm thickness & anodized silver finish • Load Capacity: 150 Kg • SAFETY FEATURES: Folding step ladder should have specially designed angled rubber shoes & innovative step lock gives unrivalled stability and ensures the ladders stays in its extendable form without shaking or wobbling while in use. Ideal For Cleaning Windows, Interior & Exterior Painting & Decorations and for all other household & office works	

	• WARRANTY: 2 YEARS WARRANTY against all manufacturing defects	
H	**Heavy duty Platform Trolley,** • Load Capacity: 500 Kg • Platform: Rectangular, Welded Steel deck construction with iron frame and stainless steel sheet, dimension - 4 ft X 2.5 ft • Wheels: 4 Castor wheel; 150 x 35 mm or better • Handle: Tunable along with the front 2 wheels; ergonomic • WARRANTY: 2 YEARS against all manufacturing defects	

30. INVERTER

- Sine Wave Inverter
- Rates should be quoted separately for
  Capacity 3.5 KVA, Rated Power 2940 W (or 3KVA)
  Capacity 5.5 KVA, Rated Power 5500 W (or 5KVA)
- No. of Battery Support should be mentioned (150Ah Tubular only)
- Safe for sensitive appliances with Sine wave output
- Auto over-load handling capacity
- Installation and maintenance friendly
- MCB for protection from Input mains
- Bypass switch
- Display to easily understand status of mains availability, battery status, etc.
- Comprehensive protection against short-circuit, reverse polarity, battery over-charge, deep-discharge etc.
- Adaptive Battery charging control system technology (ABCC) ensures faster battery charging and enhances battery life by around 70%
- Supports a wide battery range, i.e. Flat Plate, Tubular & VRLA (SMF)
- All battery to be given along with the inverter must be quoted with type, model, rate and warranty thereof.
- 24 Month Warranty for inverter

31. OFFICE FURNITURE & ACCESSORIES

Sl. No	Item (Specifications)	Reference Image
A	**Office Table** • Table – Dimension : 4ft x 3ft x 2.5ft (L x B x H) • Table should be made up of 19mm marine grade, termite proof ply of make – Austin ply, century ply, green ply, kit ply, national ply with 1mm lamination on all side. • The table should bear three drawers with soft closing & lock and key arrangement. • The table should bear sliding tray for keyboard and wire duct manager. • Under table arrangement – Rack for CPUwith castor	
B	**Side Table for office** • Dimension – 3ft x 1ft 6 inch x 2ft 3inch(L x B x H) • Table should be made up of 19mm marine grade, termite proof ply of make – Austin ply, century ply, green ply, kit ply, national ply with 1mm lamination on all side. • The table should bear three drawers with soft closing & lock and key arrangement and side by side two open racks.	

C	**Executive chair mediumback** •Adjustable seat height, Seat lock, Head support, Recline •360º swivel casters •Upholstery type – Cushion Leatherette •Armrest cushioned firmly fitted with seat •Stainless steel all framework. •Warranty – Minimum 3 years on Stainless steel frames, handles and castor wheels.	
D	**Executive chair high back** •Adjustable seat height, Seat lock, Head support, Recline •360º swivel casters •Upholstery type – Cushion Leatherette •Armrest cushioned firmly fitted with seat •Stainless steel all framework. •Warranty – Minimum 3 years on Stainless steel frames, handles and castor wheels.	
E	**S Type chair with armrest** •Cantilever Chair •Leatherette cushioned chair with stainless steel frame •Sturdy cushioned armrest •Load capacity – 150 kg •Warranty- 1year	

F **Type 1**	**Visitor chair** • Type: 3 seater • Material- MS with Powder Coating • Seat height- 17 inch • Seat and back cushioned • Warranty – 1year	
F **Type 2**	**Visitor chair** • Type: 3 seater • Material- 22 Gauge tubular Metal frame (powder coated) with cushion • Seat and back cushioned; seat height – 17 inch • Warranty – 1year	
F **Type 3**	**Visitor Chair** • Type: 3 seater • Material- Stainless steel frame with PU seating and SS arm • Seat height – 17 inch • Warranty – 1year	
F **Type 4**	**Visitor Chair** • Type – Single seater • All framework stainless steel • 4 leg chair with rubber pad on legs; durable armrest • Leather cushioned seat and back • Premium cushioned seat and back; high quality soft fabric upholstery • Warranty – 1 year	

G	**Steel Almirah Storewell** • Material – Steel, 20 gauge, powder coated • Dimension – W x H x D: 101.8 cm x 198 cm x 53.5 cm (3 ft 4 in x 6 ft 5 in x 1 ft 9 in) • With Godrej lock and three keys • Number of shelves - 4 • Warranty – 1 year	
H	**Slotted Angle Rack** • Material – Iron, painted • Dimension – W x H x D: 36 inch x 60 inch • Number of shelves - 5 • Warranty – 1 year	
I	**Reception Table** • Table – Dimension : 5ft x 2.5ft x 2.5ft (L x B x H) • Table should be made up of 19mm marine grade, termite proof ply of make – Austin ply, century ply, green ply, kit ply, national ply with 1mm lamination on all side. • The table should bear one drawer and one cupboard on both side with soft closing with telescopic channel & lock and key arrangement. Provision for Foot rest at centre • Glass partition (front, table top) – 12 mm side polished with hatching	

32. -20°C DEEP FREEZER VERTICAL

- MAKE and Model -to be quoted.
- Type- Vertical deep Freezer Double wall.
- Wall- Exterior made of sheet steel with powder coated and Inner made of non-corrosive material.
- Temperature range: -17°C to -24°C.
- Capacity: 344 litres.
- No. of Shelves: to be mentioned
- Manual Defrost with locking facility.
- Upper half is drawer and lower half is shelves will be ideal.
- Hermetically sealed Noise less compressor CFC free.
- Lockable door to avoid unauthorized opening.
- Air tight door gasket Solid single door.
- Faster temp. Recovery after door opening and maintains stable temp. Throughout.
- Power Supply:220-230V/50Hz single phase power supply
- Dimension: -To be quoted
- Digital Temp. Controller and Indicator
- Warranty- 3 years from the date of Installation
- Desired Servo Voltage Stabilizer with input range of 130 v to 280 volt to be quoted
- Other required condition for installation

33. 45KVA D.G. SET WITH MCP/AMF CONTROL PANEL

TECHNICAL SPECIFICATION:

Engine details:

Engine Rating	45KVA
Make & Model	Should be mentioned
Engine Rated HP	53
Stroke	Four
No. of Cylinders	Four
RPM	1500
Cyl. Configuration	In-line
Direction of Rotation	Counter Clockwise viewed from flywheel end
Method of aspiration	TAC
Method of cooling	Coolant cooled
Type of Governor	Electronic
Starting system	12V Electric Start
Overload capacity	10% for 1hr. in every 12hrs running
Duty	Continuous
Safety control	Low lube oil pressure, High coolant Temp., Over speed
Bore & Stroke	104 X 113 mm
Displacement	3.84 Ltrs
Compression ratio	16.5:1
Applicable Standards	ISO 3046, BS 5514

Alternator:

Make	Should be mentioned
Rating	45KVA
KW	36KW
Type	Brushless
Excitation	Self excited, self regulated (AVR)
Enclosure	SPDP
Enclosure protection	IP-23
Rating	Continuous
Rated current	63Amps
Rated Voltage	415V
No. of Phases	3Ph
Frequency	50Hz
Power factor	0.8pf
Class of Insulation	H

Voltage Regulation	±0.5%
Overload capacity	10% for 1hr. for every 12hrs. running
Applicable standards	IS 4722/BS 5000

Accessories:
The following accessories will be supplied/fitted with the DG Set:-

1) Fuel Tank 75Ltrs. capacity shall be supplied and to be mounted inside the canopy.
2) Batteries 1 No X 12V X 90AH or better
3) Battery lead & link
4) Anti-vibration mounted pads (fitted inside the canopy)
5) Residential silencer (fitted on top of canopy)
6) First fill of lube oil & coolant.

Acoustic enclosure:
Acoustic enclosure shall be made of specially procured CRCA Sheet and structural sheet metal Base frame and comply with CPCB norms with following features:

- The most compact, six sided close, modular construction and detachable.
- Meet CPCB / MOEF norms.
- Sound level < 75 dBA at one meter distance.
- Easy accessibility around the DG Set, which ensures optimum serviceability.
- Special powder coated enclosure, weather proof, corrosion resistant, environment friendly.
- Specially designed lifting hooks.
- Provision for emergency stop facility.
- Fuel tank of 75Ltrs. capacity should be mounted inside the enclosure as an integral part of Acoustic enclosure.

Canopy dimension:
Should be mentioned
AMF Panel:
Suitable for auto-start, auto-stop & auto changeover facility.
Installation:
Including Civil Foundation, four nos of earthing, cabling, shed, diesel for commissioning.
Commissioning:
To be done by the tenderer.
Warranty:
3 years from the date of installation.

34. CELL CULTURE INCUBATOR

- Make and model-To be quoted
- Dimension - To be quoted
- Double walled- Outer mild steel powder coated, inner stainless steel
- LCD display- advanced PID Controller with timer
- Shelves-2 nos. stain less steel
- Double door facility (inner –see through door).
- Power consumption in Watt- To be quoted
- Warranty- 1 year

35. DUAL BLOCK PCR MACHINE

- Dual block Gradient PCR machine compatible for 0.2ml & 0.5ml tubes in both the block
- Independent block operation, with separate run status access.
- Automatic lid height adjustment for 0.2 & 0.5ml tubes.
- 12°C gradient range of in 6-8 column gradient for 0.2 mL tubes
- Gradient Technology ensures ramp rates are identical in both gradient and normal operation
- Gradient temperature range: 30 - 99°C
- Block should have Triple Circuits of peltier which ensures precise control of temperature in the block.
- Block temperature control range: 4°C-99°C or more
- Lid temperature range: 37-110°C
- Block Temperature Accuracy: ± 0.2°C
- Block Homogeneity: ≤ ±0.3° C (20°C to 72°C); ≤ ± 0.4°C (90°C)
- Heating rate: approximate 3°C/s, Cooling rate: 2°C/s
- Adjustable ramp rate to meet critical amplification conditions
- Block should maintain below 20°C during heating-up the lid temp to its set temp to avoid unspecific amplification
- Intuitive Graphic programming with larger display
- Administrator and user login with or without PIN for enhanced security
- Preprogrammed templates for easy selection from 16 temperature protocols
- Customized programming allows a maximum of 20 steps and 99 cycles
- Auto Restart facility with user defined time interval when power fails and resumes
- Two USB ports: for Protocol transfer, Self-test, USB, printer / mouse
- E-mail Notification
- Cooling vents at bottom and rear allow placing other instruments in limited bench space
- Maximum power consumption: Approximate 700 W
- Calibration according to NIST (USA), DKD/PTB (Germany) UKAS/NPL (UK), UL/CUL listed
- Warranty- 3 years

36. HOT AIR OVEN-THERMOSTATIC

- Temperature range: Ambient +5°C to 250°C.
- Temperature control accuracy/uniformity: ± 1°C at 100°C., ± 2°C at 200°C.
- Temperature display Digital LED 31/2 digit.
- Control type: Microprocessor PID, Auto tune, Calibration off set.
- Insulation Rock wool
- Input voltage 230Volts AC, 50 Hz.
- Outer cabinet S.S 304 grade dull matt finish
- Inner stainless steel mirror finish
- Precise PID Temp. Controller CE marked
- Silicon door gasket, Validation port, Safety control.
- Supplied with SS Wire mesh shelves.
- Forced air circulation, by means of a motorized blower.
- With IQ, OQ, PQ documentation.
- Temperature sensor probe calibration with traceability to ERTL
- Temperature controller calibration with traceability to ERTL
- High temperature safety cut-off with audio/visual alarm.
- Size of the inner chamber: 60 x 60 x 60 cm approx.
- No. of shelves: 3
- Load: 3 KW
- Warranty-3 Years

37. REFRIGERATED CENTRIFUGE

- High Capacity Cooling centrifuge of Max Speed: 200-14,000 rpm or more, Max rcf: 20,500xg or more
- Max capacity: For fixed angle rotor: 6x85ml tubes, for swing out rotor: 4x750ml bottle
- Temperature range: -10^0C to 40^0C
- Noise level:<56 dB(A) or less
- Acceleration & breaking ramp: 10/10
- Timer: 1-99min or continuous mode
- Short spin key with selectable rotational speed
- Centrifuge timer should start after the set RPM reached
- Values can be changed during centrifugation
- Program memory minimum 10 or more
- All the rotors, lids and adaptors should be autoclavable
- Rotors must be metal for quick temp transfer to sample
- MTP rotor must compatible
- Low access height for easy loading & unloading of samples
- Dimension:
- Suitable Servo Voltage Stabilizer should be supplied.
- Rotors: Fixed angle rotor for 6 x 100/6x 85ml with adaptor for 15 & 50ml

conical tubes at speed12000 rpm (18500 xg) or more
- Fixed angle rotor for 30x 1.5 & 2.0ml micro centrifuge tubes at speed 14000 rpm (20800xg)
- Optional rotor: 12 x 2 ml, 12 x5 ml, 6 x 50 ml and rotor for PCR.
- All adaptable rotors for the quoted model may be quoted as optional.
- Warranty: 3 year

38. SHAKING INCUBATOR (ORBITAL INCUBATOR CUM SHAKER)

- Motor with variable frequency drive suitable for continuous operations
- Universal Shaking Platform to accommodate different sized assorted flasks, Test tubes, 96-well plate
- Air circulation to maintain uniform conditions inside chamber
- Both heating cooling facility (Accuracy: 5°C to 60°C, ± 0.5°C)
- Safety cut off & alarms for high / low set temperature
- Display: LCD Screen for all parameters
- Supplied with microplate holder (96 well plate) and culture tube holder (15 ml and 50 ml)
- Clamp holder for 100 ml, 250 ml, 500 ml and 1000 ml
- Suitable Voltage Stabilizer having Input range 130 volt- 280volt
- Warranty - 3 years

39. TABLE TOP CENTRIFUGE (NON-COOLING)

- Type- Laboratory table top Centrifuge
- Rotor - Capacity (ml): 16x15 ml/8x15 ml
- Rotor for 1.5 ml to be quoted extra
- Type of Head- Angle Rotor
- Head No. of Tubes- 16
- Maximum Speed (RPM) - 6000
- Digital Timer Range: 0-59 minutes
- Stabilizer- to be quoted
- All adaptable rotors for the quoted model may be quoted as optional.
- Warranty: 3 year

40. MICRO CENTRIFUGE

- Make and model-To be quoted
- Max Speed: 200-14,000 rpm or more, Max rcf: 20,500xg or more
- Max capacity: 0.2-1.5 ml tube or more
- Temperature range: 25^0C or more
- Warranty - 3 years

41. VAN VEEN GRAB

- Collecting mud (sediment/sludge/deposit) samples from the bottom of rivers, lakes, ponds, shallow sea etc
- Stainless steel
- 3-5 kg Capacity
- Warranty: 3 Years

42. SIEVE SHAKER

- Can carry up to 7 sieves of 8" Diameter it is driven by 1/4 HP electric motor, through reduction gear.
- With Sieves from 10-230 A.S.T.M. (two sets: one set having 21 Sieves)
- The whole gear mechanism which gives circular end to end motion runs in oil bath.
- The tapping motion is given by hammer from top.
- Works on 220/230 volts single phase AC.
- Fitted with GE/ Cromption /equivalent motor.
- It should comprise of sets of nested sieves suspended from a bar which is oscillated by shaft crank driven by an electric motor.
- The sieves should be able to stack in descending order in the holder.
- Warranty: 3 Years

43. HOT AND COLD BATH

- Make and Model- to be quoted
- Dimension – should be mentioned
- **Power Supply:**
  Main connection: 100 to 240 V ± 10%, 50 to 60 Hz
  Power consumption: 90W
- **Ambient conditions:** for indoor use only
  Ambient temperature: 4 to 35 °C or better
  Relative humidity: 70% max.
- **Application parameters**:
  Temperature control range –
    Exchangeable thermoblocks for micro test tubes – 13 °C below room temp to 99°C
    Exchangeable thermoblocks for micro test plates – 10 °C below room temp to 99°C
  Temperature accuracy –
    Exchangeable thermoblocks for micro test tubes –
      at nominal values between 20°C and 45 °C = ±0.5°C
      at nominal values between <20°C and >45°C = ±2.0°C
    Exchangeable thermoblocks for micro test plates –
      at nominal values <70 °C = ±2.0°C
      at nominal values between 70°C and 99°C = -5.0°C
- **Technical Data:**
  Heating rate: approx. 5°C/min or better
  Cooling rate: 2 to 3 °C or better
  Cooling rate from room temperature to 13°C below room temp: 0.5 to 1.0 °C/min
  Mixing frequencies for –
    Exchangeable thermoblocks 0.5 ml – 300 to 1500 1/min
    Exchangeable thermoblocks 1.5 and 2.0 ml – 300 to 1400 1/min
    Microplates – 300 to 1400 1/min
    Falcon tubes – 300 to 750 1/min
    Cryo tubes – 300 to 1400 1/min
- **Interfaces:**
    EDP connection – RS-232, Sub-D9 male
- **Time Interval:**
    Programmable time interval – 1 min to 99.59 hours, infinitely adjustable
- **Warranty:** 3 Years from the date of installation.

44. STEREO ZOOM MICROSCOPE

Trinocular Stereo Microscope with Photography Attachment

- Total Magnification: 40X-160X
- Viewing Head: Trinocular head, 45° inclined and 360° rotatable.
- Eye piece: SWF10X/ 20X.
- Zoom Range: 0.8X – 4X
- Zoom Ratio: 4.5:1
- Working distance: 95mm.
- Interpupilary distance: 55-75mm
- Achromatic Objective: zoom 1X to 4X.
- Transmitted & Reflected Illumination: LED
- with brightness adjustable
- Numerical Apertures: 0.05
- Integrated CMOS camera and Software
- Warranty: 3 years

45. SCHLENK LINE

Specification

- Schlenk line manifold double bore glass stopcock (Schott duran Germany), twoend closed and Hose barb connections at other two ends, 4 ports.
- Accessories: Solvent Traps, vacuum detachable 45 x 250 mm, 40/38, gas bubbler to fit with the line; Dewar flask, wide mouth with al aluminium housing: 1 lit capacity: 1No
- Warranty: 3 Years

46. CRYOGENIC LIQUID NITROGEN CONTAINER

Specifications

- Container Type- Open Top Container
- Tank Material- Aluminium/similar materials
- Capacity- 10 lit, 20 lit, and 2 lit
- Aldrich® low form dewar flask: 600 ml, 275ml
- Vencillow form dewar flask (cat. 8195): 300 ml
- Low temp thermometer: -50 to +50C
- Red Alcohol.
- Length: 300mm
- Resolution: 1˚C

47. ROTARY VACUUM PUMP

Specifications

- Two stage Rotary van Pump
- Nominal rotational speed: 1500 rpm
- Displacement: 14 M^3/hr
- Peak pumping speed: 12 m^3h^{-1}
- Ultimate vacuum (total pressure): 2 x 10^{-3} mbar / 1.5 x 10^{-3} Torr
- Max allowed outlet pressure: 0.2 bar gauge
- Exhaust flange: NW25
- Noise level: ~ 48 dB(A)
- Operating temperature range :12 to 40 °C
- Water vapour capacity :More than 200 gh-1
- Water vapor pressure: More than 30 mbar
- Power connector 1-ph: IEC EN60320 C13
- Pumps with inbuilt anti- suck back protection.
- Vendor should supply Rotary Pump with Suitable filter and Pump Line Cord.
- Vendor should also supply all other fitting like clamping ring. Nozzle, o ring with suitable corrosive resistant Active Pirani gauge & suitable digital controller.
- Extra oil: 2 lit
- Warranty: 3 years

48. FUME HEAD

Sl. No.	Features	Specifications
	Type	High performance fume hood for AC labs
1.	Usage	Heavy duty in chemistry laboratory
2.	Reference Standards	Parameters to qualify ASHRAE110-2016alltests
3.	Design structure	Aerodynamic, high performance
4.	Air suction capacity	600cfm @ 80FPM face velocity at 450 mm safe open height or better
5.	**Dimension**	
6.	Outer with base	1800L x 900D X 2400H mm
7.	Internal working	1740 x 650 x 1195H mm
8.	Base cabinet size	865L x 600D x 640H with plinth base
9.	MoCof superstructure	Galvanized Iron (GI)asperIS277:2003standard
10.	Superstructure Panel thickness	1.0 mm thickness for panels,1.2mmforbackpillarsandcornerposts
11.	Corner Post	Triangular profiled corner post at LHS and RHS of the Fume hood. It should house the gas and water flow control valves and electrical sockets, isolated from each other with a proper protection. All utility outlets will be fitted on the back side of the post and are terminated at the top of the fume hood.
12.	Service Panel	Easily openable, gas spring mounted top service panel. 1.2 mm powder coated, made up of GI. Gives easy access to tube light, electrical junction box, utility end connections, airflow valve, fire extinguisher (if any)
13.	Inside liner & baffle	Chemical & heat resistant, fire retardant, smooth finish, easily cleanable panels made out of durable PRL integral work walls (4 mm thick for sides & 6 mm for top & back panel). ASTM flame spread index <25.
14.	Back Baffle	8 way exhaust system with perforated & inclined back baffles. The baffles are fitted in such away to have a smooth and rapid exhaust of the heavy and light weight fumes.
15.	Airfoil	SS304 (1.2mm) air foil with replaceable transparent PTFE coated film (100micron). Fixed type with perforations at the bottom of air foil for laminar air entry.
16.	Worktop	Chemical resistant splash & spillage proof dished ***'Jet***

		Black Granite' work top (18±1 mm thick). Skirting of 15 mm from all sides for no chemical spillage.
17.	Sink, Water tap with drain arrangement	150 mm dia PP sink (internal dia 130 mm & depth 120 mm) fitted in the front of the hood adjacent to the corner post. It is properly sealed with the granite top to avoid any water leakage. Supplied with PP bottle trap.
18.	Sash (Shutter)	Aerodynamically profiled sash handle for smooth air entry. The single finger smooth & calibrated sash movement for vertical& horizontal combinational rising sash, counter-balanced with fail- safe strong Nylon timer belt, pulley and twin counter-weight system. 50% open access for while sash is resting on air foil. The frame is made up of high quality, powder coated aluminum. Toughened Float Glass sash (5 mm thick for vertical & 6 mm for combination). Smooth and lights as operation. Clear openable height = 720mm.
19.	Wet & Dry Service valves	Remotely operated Colour coded **Brass Needle Valves** for fine control over utilities (as per DIN 12920 norms) **total 6 nos**. service valves with SS braided/PU tube plumbing with 6mm internal dia, withstands up to 10 kg f Pressure. Duly tested at factory.
20.	Internal nozzles	Internal nozzles are fitted in the rear side of the front corner posts. Also, the taps are tapered in shape to use with flexible tubing of sizes from ¼" to ½" in dia, to provide greater flexibility to the user.
21.	Lighting	Option for two 20w LED light fitting with vapour-proof, spark proof fitting for proper illumination.
22.	Electrical utilities	**4 nos.** electrical sockets (230V, 6/16A, 50Hz), 4 **nos.** Cables & wires 'Fire Retardant' grade.
23.	Electrical Accessories	Blower on-off switch, Light switch, Air flow monitor switch, Emergency stop are fixed in the facia and all are pre wired and terminated in the electrical box fitted at the top of the hood
24.	Cable entering port	Useful to connect the lab instruments cables to the sockets. Moulded PP port (dia 70 mm) with transperent acrylic cover in both sides of front pillar for easy access of cables with plug.
25.	Drawer for consumables	One soft closing drawer for keeping lab consumables/records/stationery above the base cabinet
26.	Base cabinet (Reagents)	Ventilated and on plinth, MoC: GI powder having internal PP liner, One shelf of 20 kg load bearing capacity, doors fitted with CED coated hinges ORSS

		butt hinges for superior chemical resistance. Exhaust port is connected to a flexible pipe with fume hood top for ventilation.
27.	Exhaust Port	Low pressure drop design rectangular to round exhaust port. Low pressure drop design ensures that the fumes will be exhausted smoothly without any turbulence at the exhaust port.
28.	Flow control Damper	Built in compact damper to adjust air flow within the hood for air balancing. Butterfly type damper with locking arrangement. MoC:PP.Dia250mm
29.	Sash stopper	Sash stopper is installed at safe opening height to restrict frequent opening of sash. It has to be removed if one wishes to raise the sash beyond this point for equipment setup purpose.
30.	Grid	Lattice Grid for clamping stirrer or distilator, Moc:SS. Gridsize:1720x700for6ft,
31.	**Centrifugal Blower**	
32.	Construction	SISW type, chemical & heat resistant PP + FRP blower with aerodynamically balanced PP impeller, with drain plug
33.	Air Suction Capacity	**850CFM at 50 mm WC static pressure** confirming to international face velocity norms and as per safe fume hood air flow pattern
34.	Motor	**1.5HP, 415V, 50Hz, DutyS1,** 3 Phase TEFC, IP55, Class F, Non FLP, as per IS325
35.	Connection to blower	Directly to the blower Shaft, Factory balanced
36.	Ducting	Chemical resistant PP + FRP (**3mm + 2mm**) rigid & flexible ductwork from Fume hood to exhaust stack point with weather proof canopy. Total ducting with horizontal, vertical members, flanges, bends, bracketed supports and goose neck exhaust stack
37.	Duct support	MS angle support with MS Bracket, Nut and bolt
38.	Warranty	3 years

49. ELECTROCHEMICAL WORKSTATION WITH SPECTRO-ELECTROCHEMICAL SYSTEM (SECS)

Specifications

- Compliance voltage: ± 12 V or better at ± 250 mA
- Maximum Output Current: ± 200 mA or better at ± 10 V
- Output Voltage Range: ± 10 V
- Current ranges smallest current range: ± 50 pA to ± 250 mA or better
- Resolution of applied potential: 150 nV or better
- Accuracy of applied current: ± 0.2 % of the current range or better
- Measured current resolution: 30 fA or better
- Potentiostat rise/fall Time: 7 MHz or better
- Interface: USB/Serial interface for connection with PC
- Input bias current: < 20 PA or Better
- Cyclic Voltammetry with Scan Rate: 10 μV/s to 5,000 V/s or better
- Differential Pulse Voltammetry and Normal Pulse Voltammetry with Pulse width: 0.001 to 10 sec.
- Should have the following techniques: (a) Cyclic Voltammetry (CV) (b). Linear Sweep Voltammetry (LSV) (c) ChronoAmperometry (CA) (d) ChronoCoulometry (CC) (e) Differential Pulse Voltammetry (DPV) (f) Normal Pulse Voltammetry (NPV) (g). Square Wave Voltammetry (SWV) (h). Bulk Electrolysis with Coulometry (BE) (i). Open Circuit Potential – Time (OCPT) (j). Full version of CV simulator (k). IR Compensation (l). External Potential Input (m). Auxiliary Signal Measurement Channel
- Cell for Cyclic Voltammetric studies and Spectro-electrochemical (SECS) Measurements: It should consist of the following: (a) Four Glass cells and Cell stand for the operation of CV and two 0.2 mm Quartz cuvettes for SECS (b). Minimum three Pt and three Glassy Carbon working electrodes for CV (c). One Pt gauze electrode for SECS (d). One Pt wire Counter electrode (e). Two Ag/Ag+ reference electrode (non-aqueous) (f). One SCE Electrode (g). Electrode polishing kit (h). Cell stand for CV studies.
- UV Vis Spectrophotometer for In situ Spectro-electrochemical Studies: UV-Vis Spectrophotometer for measurement of change in absorbance or transmittance. Cuvette holder for transmittance and absorbance measurements. It should have data analysis and control software to work on computer. (a). Wavelength Range: 200 nm to 1000 nm or better (b). Optical resolution of ~0.1-10.0 nm FWHM (c). Light Source: 210 nm to 2500 nm. (D). Accessories for in situ absorption and transmission studies

- Software: Licensed copy of Software for Spectro-electrochemical data analysis Windows based Software for measuring and analyzing data of electrochemical and Spectro-electrochemical measurements multiple user license along with the original installation software in a CD or USB flash drive should be provided .The software should support above mentioned measurements, simulation and fitting program.

- Instrument should be installed, tested and commissioned by manufacturer, or representative at site with no additional cost.
- Spectro-electrochemistry Cell should include Cell Top, Pt Gauze Electrode (Flag Type) &Pt Counter Electrode, 0.5 mm and 1 mm path quartz cuvette.
- One Year Exclusive Warranty.
- Other Specifications /requirements: The complete system should operate at standard 230 V, 50 Hz power supply Capable for extending absorption up to 2000 nm or better and upgradable to measure florescence with suitable hardware/software on a later date. Whole set up should be adaptive to be connected to a desktop computer. (Specifications may be mentioned for the desktop).

50. HIGH PERFORMANCE COMPUTATIONAL FACILITY

Technical Specifications

a) Master Node – 1 Unit

Component	Description of Requirement
Form Factor	Max. 2U Rack Mountable
CPU	2 x Intel Xeon-Gold 6330 2.0 GHz, 28 cores, 42 MB cache or higher
Motherboard	Intel® C621 Series Chipset
Memory	32 DIMM slots. 128 GB (4 X 32GB) memory
Boot device	2 x 480GB enterprise class OS boot device with - dedicated hardware RAID 1 support - full hot-plug support - support replacement without powering down the server - easy accessibility support, front or rear facing
Controller	PCIe 3.0 based 12Gb/s SAS Raid Controller with minimum 8 MB NV cache
EAL security certification	System's integrated remote management hardware & tool should be minimum Evaluation Assurance Level (EAL) EAL2+ certified. Certificate from Common Criteria Portal to be submitted
Networking features	2 x 1G Network port, 2 X 10 G Base-T network ports 100Gb (EDR/HDR) Single port InfiniBand Adapter
Storage connectivity	Dual port 32 Gbps FC HBA
Interfaces	USB 3.0 support With Up to 3 available ports total
Bus Slots	Three PCI-Express 3.0 slots, at least two x16 PCIe slots
Power Supply	Platinum certified hot-plug redundant power supplies (reference from certification site to be submitted)
Fans	Redundant hot-plug system fans
Serviceability	Should provide proactive notification for actual or impending component failure alerts on following critical components - fans, power supply, memory, CPU, RAID, NIC, excessive SSD wear
Operating Systems and Virtualization Software Support	Red Hat Enterprise Linux (RHEL) Microsoft Windows Server SUSE Linux Enterprise Server (SLES) VMware
Security	Silicon-based hardware root of trust, automatic secure BIOS recovery, cryptographically signed firmware update, configuration and firmware drift detection, protection against compromised firmware execution, cryptographically verified trusted booting meeting NIST SP 800-147B and NIST SP 800-155 standards (web published server OEM documentary evidence to be submitted).
Visual monitoring	Front LCD display panel for viewing system information, status and error messages (to indicate if the system is functioning correctly or requires attention) & system's iDRAC IP address.
Quality assurance	The server should be fully integrated in the factory & shipped with a unique login password to prevent in-transit tampering
Spare support	OEM's spare inventory warehouse (GST registered) in Bhubaneswar

Reference	Product data sheet, BoQ and other relevant reference documents to be submitted for detailed bid evaluation
Warranty	Server Warranty includes 5-Year Parts, 5-Year Labor, 5-Year Onsite support with next business day response.

b) IO Node – 2 Unit

Component	Description of Requirement
Form Factor	Max. 2U Rack Mountable
CPU	2 x Intel Xeon-Silver 4310, 12 cores, 18 MB Cache
Motherboard	Intel® C621 Series Chipset
Memory	32 DIMM slots. 128 GB (4 X 32GB) memory
Boot device	2 x 480GB enterprise class OS boot device with - dedicated hardware RAID 1 support - full hot-plug support - support replacement without powering down the server - easy accessibility support, front or rear facing
Controller	PCIe 3.0 based 12Gb/s SAS Raid Controller with minimum 8 MB NV cache
EAL security certification	System's integrated remote management hardware & tool should be minimum Evaluation Assurance Level (EAL) EAL2+ certified. Certificate from Common Criteria Portal to be submitted
Networking features	2 x 1G Network port, 2 X 10 G Base-T network ports 100Gb (EDR/HDR) Single port InfiniBand Adapter
Storage connectivity	Dual port 32 Gbps FC HBA
Interfaces	USB 3.0 support With Up to 3 available ports total
Bus Slots	Three PCI-Express 3.0 slots, at least two x16 PCIe slots
Power Supply	Platinum certified hot-plug redundant power supplies (reference from certification site to be submitted)
Fans	Redundant hot-plug system fans
Serviceability	Should provide proactive notification for actual or impending component failure alerts on following critical components - fans, power supply, memory, CPU, RAID, NIC, excessive SSD wear
Operating Systems and Virtualization Software Support	Microsoft Windows Server Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) VMware
Security	Silicon-based hardware root of trust, automatic secure BIOS recovery, cryptographically signed firmware update, configuration and firmware drift detection, protection against compromised firmware execution, cryptographically verified trusted booting meeting NIST SP 800-147B and NIST SP 800-155 standards (web published server OEM documentary evidence to be submitted).
Visual monitoring	Front LCD display panel for viewing system information, status and error messages (to indicate if the system is functioning correctly or requires attention) & system's iDRAC IP address.
Quality	The server should be fully integrated in the factory & shipped with a unique login

assurance	password to prevent in-transit tampering
Spare support	OEM's spare inventory warehouse (GST registered) in Bhubaneswar
Reference	Product data sheet, BoQ and other relevant reference documents to be submitted for detailed bid evaluation
Warranty	Server Warranty includes 5-Year Parts, 5-Year Labor, 5-Year Onsite support with next business day response.

c) Compute Node (non GPU) - 16 Units

Component	Description of Requirement
Form Factor	Max. 2U Rack Mountable
CPU	2 x Intel Xeon-Gold 6330 2.0 GHz, 28 cores, 42 MB cache or higher
Motherboard	Intel® C621 Series Chipset
Memory	32 DIMM slots. 256 GB (8X32GB)
Boot device	2 x 480GB enterprise class OS boot device with - dedicated hardware RAID 1 support - full hot-plug support - support replacement without powering down the server - easy accessibility support, front or rear facing
HDD Bays	2 x 960 GB SSD
Controller	PCIe 3.0 based 12Gb/s SAS Raid Controller
EAL security certification	System's integrated remote management hardware & tool should be minimum Evaluation Assurance Level (EAL) EAL2+ certified. Certificate from Common Criteria Portal to be submitted
Networking features	2 x 1G Network port, 2 X 10 G Base-T network ports 100Gb (EDR/HDR) Single port InfiniBand Adapter
Interfaces	USB 3.0 support With Up to 3 available ports total
Bus Slots	Three PCI-Express 3.0 slots, at least two x16 PCIe slots
Power Supply	Platinum certified hot-plug redundant power supplies (reference from certification site to be submitted)
Fans	Redundant hot-plug system fans
Serviceability	Should provide proactive notification for actual or impending component failure alerts on following critical components - fans, power supply, memory, CPU, RAID, NIC, excessive SSD wear
Operating Systems and Virtualization Software Support	Microsoft Windows Server Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) VMware
Security	Silicon-based hardware root of trust, automatic secure BIOS recovery, cryptographically signed firmware update, configuration and firmware drift detection, protection against compromised firmware execution, cryptographically verified trusted booting meeting NIST SP 800-147B and NIST SP 800-155 standards (web published server OEM documentary evidence to be submitted).
Visual monitoring	Front LCD display panel for viewing system information, status and error messages (to indicate if the system is functioning correctly or requires attention) & system's iDRAC IP address.

Quality assurance	The server should be fully integrated in the factory & shipped with a unique login password to prevent in-transit tampering
Spare support	OEM's spare inventory warehouse (GST registered) in Bhubaneswar
Reference	Product data sheet, BoQ and other relevant reference documents to be submitted for detailed bid evaluation
Warranty	Server Warranty includes 5-Year Parts, 5-Year Labor, 5-Year Onsite support with next business day response.

d) GPU Node – 1 unit

Component	Description of Requirement
Form Factor	Max. 2U Rack Mountable
CPU	2 x Intel Xeon-Gold 6330 2.0 GHz, 28 cores, 42 MB cache or higher
Motherboard	Intel® C621 Series Chipset
Memory	32 DIMM slots. 256 GB (8X32GB)
Boot device	2 x 480GB enterprise class OS boot device with - dedicated hardware RAID 1 support - full hot-plug support - support replacement without powering down the server - easy accessibility support, front or rear facing
HDD Bays	2 x 960 GB SSD
Controller	PCIe 3.0 based 12Gb/s SAS Raid Controller
EAL security certification	System's integrated remote management hardware & tool should be minimum Evaluation Assurance Level (EAL) EAL2+ certified. Certificate from Common Criteria Portal to be submitted
Networking features	2 x 1G Network port, 2 X 10 G Base-T network ports 100Gb (EDR/HDR) Single port InfiniBand Adapter
Interfaces	USB 3.0 support With Up to 3 available ports total
Bus Slots	Three PCI-Express 3.0 slots, at least two x16 PCIe slots
GPU	4 X Nvidia A2 16 GB DDR6 or higher
Power Supply	Platinum certified hot-plug redundant power supplies (reference from certification site to be submitted)
Fans	Redundant hot-plug system fans
Serviceability	Should provide proactive notification for actual or impending component failure alerts on following critical components - fans, power supply, memory, CPU, RAID, NIC, excessive SSD wear
Operating Systems and Virtualization Software Support	Microsoft Windows Server Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) VMware
Security	Silicon-based hardware root of trust, automatic secure BIOS recovery, cryptographically signed firmware update, configuration and firmware drift detection, protection against compromised firmware execution, cryptographically verified trusted booting meeting NIST SP 800-147B and NIST SP 800-155 standards (web published server OEM documentary evidence to be submitted).

Visual monitoring	Front LCD display panel for viewing system information, status and error messages (to indicate if the system is functioning correctly or requires attention) & system's iDRAC IP address.
Quality assurance	The server should be fully integrated in the factory & shipped with a unique login password to prevent in-transit tampering
Spare support	OEM's spare inventory warehouse (GST registered) in Bhubaneswar
Reference	Product data sheet, BoQ and other relevant reference documents to be submitted for detailed bid evaluation
Warranty	Server Warranty includes 5-Year Parts, 5-Year Labor, 5-Year Onsite support with next business day response.

e) Storage - 1 Unit

#	Component	Minimum specification
01	Make & Model	(Specify)
02	Controllers	Dual active hot-swappable controllers; support for modular upgrades of disks.
03	Host interface	8 x 32Gbps FC ports (4 per controller), should auto-negotiate to 16Gbps FC
04	Host connection	Should support both direct attach to FC host ports and through SAN switches
05	Disk interface	2 x 12Gbps SAS (1 per controller)
06	System memory	32GB (16GB per controller, mirrored)
07	Storage capacity	Total 144 TB (12 X 12TB) 7.2K RPM NLSAS
08	Storage scalability	Should be scalable to 250 disks. Also should support 3PB raw capacity when higher capacity drives are available
09	Management ports	Minimum 1 across controller (1Gb Base-T)
10	Disk intermix	Support for mixing different SAS, NLSAS, SSD disk types, transfer rates & rotational speeds in the same system
11	Array configuration	Should support all-flash, hybrid flash, HDD only arrays
12	Auto-tiering	Support at least three primary (media-based) tiers
13	RAID support	RAID 1, 5, 6, 10, or distributed erasure coding to reduce rebuild times when drive failures occur; any combination of RAID levels should exist in single array
14	Thin provisioning	Should be active by default on all volumes & operate at full performance across all features
15	Read caching	Support SSD read cache to increase execution speed of applications by caching previously read data
16	Snapshots	Provide min 1000 "redirect-on-write" snapshots per array
17	Volume copy	Complete copy of standalone volumes
18	Replication	Include support for asynchronous replication with one-to-many or many-to-one target / source relationships
19	Encryption	Should support data-at-rest encryption at drive level, self-encrypting drives (SEDs) in SSD or HDD formats, Full Disk Encryption (FDE) based on AES-256 & support for drives certified to FIPS 140-2 Level 2

20	OS Support	RHEL 9, 8.2, 7.8; Windows 2022, 2019, 2016; SLES 15.2, 12.5; VMware 7.0, 6.7; Citrix XenServer 8.x, 7.x
21	Virtualization integration	VMware vSphere (ESXi), vCenter, SRM, Microsoft Hyper-V
22	Global hot spare	Allow designation multiple global hot spares for automatic replacement of a failed drive in a disk group
23	Array management	Manageable from a web-based single, secure interface without using a separate management device or server.
24	Warranty	5 years on-site comprehensive warranty with 24x7x365 remote hardware support with 6 Hrs CTR.

f) InfiniBand Switch – 1 Unit

Component	Description of Requirement
	Specify make & model
Ports	36 ports EDR/HDR 100 Gbps switch with required no. of cables
Power supply	Single
Form Factor	1U Rack-mount with rail-kit and accessories
Warranty	5 years OEM onsite warranty with next-business-day resolution

g) Management Switch 1 Unit

Ethernet Switch (Quantity-1)		
Sl. No.	**Component**	**Description (Specify make & model)**
1	Ports	Minimum 20 port 1 Gbps unmanaged switch with required no. of cables
2	Power supply	One
3	Form Factor	Rack-mount with rail-kit and accessories
4	Warranty	5 years OEM onsite warranty with next-business-day resolution

h) Smart Rack with UPS

S. No	**Description of Requirements**	
	Make:	
	Model No.:	
1	**Scope of Work**	
1.1	This specification covers intelligent integrated/inbuilt infrastructure, standalone system design, engineering, manufacture, assembly, testing at manufacturer's works, supply, delivery at site, unloading, handling, proper storage at site, erection, testing and commissioning at site of complete infrastructure for the proposed Data Centre to be installed at _____, as detailed in the specification, complete with all accessories required for efficient and trouble-free operations	
1.2	Modular and scalable design for power and cooling: The cooling shall be with N redundancy and in the Events of failure the components can be maintained easily. All the components of the infrastructure should be such that it can be easily dismantled and Relocated to different location. UPS must have N+N redundancy	

1.3	OEM Must be ISO 9001:2015, ISO 14001:2015, ISO 27001:2013, ISO 45001:2018 & OSHAS Certified.	
1.4	The offered hardware shall be latest and in current proven production for a minimum of 2 years. If the offered hardware is new, the Manufacturer must have an experience in producing the Integrated Infrastructure for a minimum of 5 years.	
2	**Requirements**	
2.1	Intelligent Integrated Infrastructure with inbuilt hot and cold aisle containment of 2 rack should cater IT load up to 14 KVA	
2.2	Intelligent Integrated Infrastructure essentially should include internal redundant or backup power supplies, environmental controls (Rack mounted air conditioning, fire suppression, smoke detection, Water leak detection and humidity sensors), and security devices. Environmental monitoring shall be done from IP based software. Cooling, Environmental monitoring unit, UPS & PDU should be from single OEM	
2.3	The detail specifications of the intelligent integrated/inbuilt infrastructure, standalone system shall be in adherence to standard Data Centre guidelines	
3	The Intelligent integrated Infrastructure shall have following components:-	
3.1	**Rack based closed loop Air-Conditioning**	
3.1.1	Data center server rack should be equipped with rack based fixed scroll cooling units to provide closed loop cooling system which should be able to cool the equipment's uniformly right from 1st U to 42nd U of Rack	
3.1.2	Rack Mount Air conditioner 9U or less with scroll compressor, of capacity 7.0 kW (2 Tr.) 02 no. to cater IT load approximately 14 kva for total 2 racks.	
3.1.3	High sensible cooling unit with 100% duty cycle	
3.1.4	Cooling capacity of 7.0 kW with fixed scroll compressor	
3.1.5	Split indoor & Outdoor unit design. Oudoor must have anti corrossive coating	
3.1.6	Cooling Unit integrated in rack, 19" mountable not more than 9U	
3.1.7	Scroll compressor for high reliability	
3.1.8	Electronically commutated centrifugal evaporator fan for high energy efficiency	
3.1.9	Air flow suitable to rack equipment from bottom to top discharge in vertical direction	
3.1.10	Thermal insulation on indoor unit	
3.1.11	Under voltage and Overvoltage protection for equipment safety	
3.1.12	High Pressure & Low Pressure protection for safe operation	
3.1.13	Washable filter with 80% efficiency down to 20 micron rating and HDPE media	
3.1.14	Flare type Thermostatic Expansion Valve for easy serviceability	
3.1.15	Refrigerant R410 / R407 compatible	
3.1.16	Hydrophilic evaporator coil	
3.1.17	Individual breakers at indoor and outdoor unit for protection	
3.1.18	Flexible Cu piping for easy indoor to outdoor connection at rack level	
3.1.19	ON/OFF switch at indoor unit for emergency purpose	
3.2	**UPS System**	**60 Min backup on each UPS Combined 60 min backup. Battery calculation sheet must be submitted along with the bid.**
	Capacity	20 kVA.
	Input Parameters	
	Rectifier Type	IGBT Rectifier

	Rated Voltage	400 Vac Three Phase Four Wire
	Input Voltage Range	Single Phase 100Vac-288Vac
	Input Freq Range	40 Hz-70Hz
	Input Power Factor	>=0.99 for Single Phase/0.95 for Three Phase
	THDi	<5%
	Battery	
	Battery Type	Lead Acid Maintenace Free
	Charging Capability.	13A
	No of Battery	24*,32,40
	Output Parameters	
	Rated Power	20kVA/20kW
	Rated Voltage	Three Phase 380/400/415 Vac and Single Phase 230/220 Vac.
	Output PF	Unity
	Voltage Stability	1%
	Output Frequency	50 Hz/ 60 Hz
	Frequency Precision	0.25%
	Output Voltage THD	<2% for Linear Load and <5% for Non Linear Load
	Load Crest Factor	3:1 Comply with IEC 62040-3
	Step Load Performance	100%
	Output Mode	Terminal Strip
	Programmable outlets	Must be available
	Overload Performance (% of Rated Load)	105%-125% 5 Mins, 125%-150% 1Min, 500ms for >150%
	System parameters and Standards	
	Conversion Type	Online Double Conversion
	Parallel Mode	3+1
	Installation Mode	Rack/Tower Convertible
	System Efficiency	96%
	Switching Time	0 msec
	Noise	>58dB
	LCD Display	Graphical gravity sense display
	Safety	IEC/EN62040-1-1
	Electromagnetic Compatibility	IEC/EN62040-2, IEC/EN61000-3-11, IEC/EN61000-3-12, YD/T1095-2008
	Surge Protection	IEC/EN62040-2, meeting IEC/EN61000-4-5
	Certifications	
	EMI/EMC	CE certified as per IES/EN 62040 standard
	ROHS	Yes
	ProtectionLevel	IP20
	Dimension (mm)	3U or Less

	Interface Type	USB/Intelligent Slot (Dry Contact Card/SIC Card/Modbus Card/RS485 Card)
	SNMP card	Integrated in UPS
	operating Temp	0-50 Degree Celsius**
	Relative Humidity	0-95% Without Condensation
3.3	**Power Distribution**	
3.3.1	Rack PDU (Vertical) - PDU 1 Ph, 230V, 32A, 20 x C13, 4 x C19, (each rack is having two PDU's).	
3.4	**Electrical system-POD**	
3.4.1	a. 19" rack mountable Power Output Device with essential breakers to be mounted in the rack. Consumes only 3U space of rack height. b. Main Incomer- 80 Amp 4 Pole MCB with suitable provision of terminal blocks for connections. c. UPS I/P - 2 nos. of 50 Amp SP MCB for UPS Supply. d. Cooling I/P - 2 nos. of 16 Amp 4P MCB for Cooling Unit Supply. e. Spares -1 no. of 32 Amp MCB for spares. f. All input supply cables from POD unit to equipments are connected with industrial socket (male - female) with suitable rating.	
3.5	**Fire Detection and Suppression**	
3.5.1	Fire detection: It should have Fire alarm through centralized monitoring unit.	
3.6	**Rack & accessories**	
3.6.1	Rack is 42 U 19'' mounting type with 2000 (Height) x 800 (Width) x 1100 (Depth)	
3.6.2	Rack frame is, scalable and modular with safe load carrying capacity of 1400 Kg on enclosure frame and 1000 Kg on 19'' mounting angles.	
3.6.3	Color shade of Rack is RAL 7021	
3.6.4	Base plinth with 100 mm height	
3.6.5	Cable entry provision from top & bottom both side of rack	
3.6.6	Cut outs with rubber grommet on top and bottom cover of rack for cable entry	
3.6.7	Vertical Cable manager on both LHS & RHS on rear side	
3.6.8	Front Glass door for complete 42U height visibility and rear plane door with stiffener for strength	
3.6.9	Thermally insulated cold aisle chamber	
3.6.10	Blanking panels to prevent air mixing	
3.6.11	LED light to be provided on each rack with status based coloring scheme.	
3.6.12	Usable space in the rack should not be less than 55 U or higher.	
3.6.13	The Intelligent integrated infrastructure would provide much functionality and some of the key functionalities are - Cold Contained Front Aisle & Rear Contained Hot Aisle, insulation, remote management and single point of service.	
3.7	**Environmental Controls**	
3.7.1	Supply and installation rack mountable monitoring system with Sensors & notification system. The appliance must not be more than 1U in height& should have redundant power supply.The system shall continuously collect critical information from network connected devices such as UPS system, Cooling Units , temperature & humidity sensors, Door sensors, Water Leak sensor. Beacon & Buzzer-Sound and Flash Led Alarm. Based on pre-set parameters, automated email alerts are sent to the intended recipients.	
3.7.2	Intelligent Rack environment remote monitoring	
3.7.3	Modbus 485 Communications & SNMP	

3.7.4	Single window for monitoring all sensors & Power monitoring through UPS system
3.7.5	Data and logs of historical information of alarms and notification
3.7.6	Temperature & Humidity Sensor, with LCD display and RJ45 connector
3.7.7	Door opening sensor with RJ 45 connector
3.7.8	Water leak detection sensor with RJ45 connector
3.7.9	Smoke detection sensor with RJ45 connector
3.7.10	Alarm device with LED flash and sound option
3.7.11	Camera for live monitoring
3.10	1 Year Onsite comprehensive warranty on the system + 4 years Post warranty AMC

PRE-QUALIFICATION CRITERIA

Sl. No.	Pre-qualification criteria	Bidder Compliance Yes/ No
1.	Bidder should be either an Original Equipment Manufacturer (OEM) or should be an authorized System Integrator Partner having back to back Support Agreement with the OEM. Manufacturer's Authorization Form (MAF) for participating in this tender is mandatory for bidders and should be attached along with the bid. The Bidder participating in the tender process should give a hard copy of the MAF on OEM letterhead confirming the bidder's authorization to participate in the tender with tender number and details.	
2.	The bidder/OEM should have executed at least three projects each with ~40% of the present project value/two projects each with ~60% of the present project value/one project ≥ 80% of the present project value using architecture and technologies similar to those being proposed in their quotation against this tender in India. Purchase order and final commissioning report copies of the same must be submitted with the technical bid.	
3.	The OEM or Bidder should have successfully executed projects at Government/ Public/ Private Research organizations /institutions performing scientific computation using High Performance Computing Clusters across the globe. Purchase order/final commissioning report with compute capacity and architecture details duly signed by customer should be submitted with the bid.	
4.	The Bidder and OEM should have the experience in building HPC Clusters in the local / global HPC Market since the last 5 years with a logistics facility in India for easy access and availability of spares and to ensure the proper back-end support for smooth execution and post-sale support operations. Documentary proofs should be attached. Bidder/OEM should have at-least 3 installations of GPU based servers for ML/DL.	

5.	The OEM should have minimum two entry in the latest top 500 supercomputer list in India maintained by SERC, IISc and CDAC (which can be downloaded at http://topsc.cdacb.in/) and should have minimum 10 entries in the latest world top 500 supercomputer list. (available at www.top500.org)	
6.	The bidder should have an average annual sales turnover of Rs. 30 Crores or more during the last three financial years ending on 31st March, 2022. Attach firm's . Bidder shall be financially sound and must not be anticipating any ownership change for three years from bid submission. An undertaking to this effect shall be submitted by the Bidder	
7.	last 3 years audited profit and loss balance sheet duly audited by Chartered Accountant (CA). Certified copy by the CA should be duly signed and stamped by the CA on the letterhead.	
8.	The entire server, storage and compute nodes must be factory integrated, tested, validated and certified in the bidder/OEM site. No on-site or local assembling of the system at Utkal University site is allowed. Documentary proof from the OEM side is required. Only rack-mounting, OS and application installation are allowed on-site for HPC Cluster.	
9.	All warranty and support must be serviced directly by the OEM or should be provided by Authorized System Integrator Partner who must have back-to-back support from the OEM. Utkal University requires that there be a Single Point of Contact (SPOC) from OEM/Vendor who is responsible for all issues between Utkal University and the OEM. Hardware and software warranty support requests are to be handled and serviced directly by the OEM/Bidder. The OEM/Bidder should have required critical spares at the local service center.	
10.	For all items the bidder must have a full-fledged service center at Bhubaneswar equipped with spare stock and certified manpower. The bidder must have an office for the last 5 years at Bhubaneswar. This is to ensure immediate delivery of spare parts from OEM to its channel partner/system integrator. Please attach the necessary documents.	
11.	The bidder should submit the BIS certificate for the quoted hardware. The OEM and Bidder should have valid ISO certification related to HPC and data center installation, management, maintenance or relevant documents. The Bidder should be a certified ISO 9001-2000, 2008 Please attach a copy of the certificate.	
12.	The complete proposed solution must have an all encompassing comprehensive onsite advance replacement warranty of 5 years' duration which includes hardware, software, firmware, software updates, etc., If the hardware replacement process takes more than two days, the bidder/OEM should provide a standby hardware till the replacement is made.	

13.	Products offered should have official OEM support for five years from the date of acceptance of installation.	
14.	Bidders should propose only enterprise class equipment.	
15.	The entire HPC solution should be proposed by the bidder/OEM with details of power consumption and power efficiency.	
16.	The Bidder must have registered an Office in Odisha & Should have a CMMi-L3 certificate.	
17.	The bidder should not be under a declaration of ineligibility for corrupt and fraudulent practices issued by Government of India or any State Governments in the country of India. Self-declaration under the seal of the head/authorized employee of the organization is to be submitted.	
18.	No Criminal Proceedings in any Court of Law should be pending against the bidding Firm Or its Board of Directors. Self-declaration under the seal of the head/authorized employee of the organization is to be submitted	

TENDER SPECIFICATION HIGH PERFORMANCE COMPUTING (HPC) CLUSTER

1. Software Compatibility:

Bidder should install servers, implement the cluster system and the latest version of CentOS Linux with softwares (which will be provided by Utkal University) and install all the libraries. All required cables including power, InfiniBand, ethernet and any other cables required for the successful implementation of the HPC must be provided by the bidder. The University will provide power input up to the UPS. The distribution from UPS to the HPC set up is the responsibility of the bidder. Both cluster manager (GUI based) and workload manager open source based to be provided for HPC framework. Bidder should carry out installation within maximum 60 days after delivery of the consignment and site readiness also it should not be outsourced to any third party. Name of the project manager should be specified in the tender document and should be an employee of the organization. The project manager should be an integral part of the installation throughout the installation and support period. He should have a good knowledge base on HPC framework. For every component 'Make and Model' must be mentioned. Also, the HPC solution provide by the bidder should be compatible with the following software & bidder is responsible for installing/configuring each one of them with scheduler (applicable licenses for each of the software shall be provided by the Utkal University):

Software	Compiled (Yes/No)	Remarks, references
(a) Open Source: FFTW, P3DFFT, GERRIS, LAMMPS, QUANTUM ESPRESSO, SIESTA, NAMD, GROMACS, CP2K, CPMD, Q-chem, Octave, CHARMS, GAMES, FP-LAPW, TensorFlow, PyTorch, Caffee2, Python, TensorRT, DeepStream, Cluster Management Software, job scheduler.		
(b) Commercial: ENVI & IDL, VASP, WIEN2k, Synopsys QuantumATK, BIOVIA Materials Studio, AOMix, Gaussian, GaussView, NBO, Mathematica, Amber, Schrödinger, SPSS, MATLAB, J-Octa, MedeA VASP, TURBOMOLE, GIBBS		
(c) Scientific Programs: Lapack, scalapack, Python, NumPy, SciPy, Setuptools, IPython, pythondev, python matplotlib, pythontk, pythonlxml, PyReadline, MDAnalysis.		
(d) Editor: Vim, Gvim, GNU plot, NTPD, GRACE, BC, VMD, Perl, etc.,		
(e) Compilers and Libraries: OpenMP, MPI, C/C++ and FORTRAN compilers, Intel & PGI compilers for C, C++, Fortran and GSL libraries should be installed.		

1. Warranty, Support, Terms & Conditions

Items	Compiled (Yes/No)	Remarks, references
a) Comprehensive onsite hardware and software warranty for 5 Years from the date of final sign off or acceptance of installation. Complete solution should have back-to-back OEM support for five years.		
b) Release of a new version of operating system, application, firmware, bug fix patches etc. for the supplied equipment should be patched / upgraded for stability and security of the system by the supplier / OEM team. The supplier / OEM support team should advise and support this activity during the warranty period. The ordered operating system, application software and equipment shall be upgraded to new versions and new releases during the warranty period. Successful bidders should have back-to-back support agreements with OEM during warranty for all the equipment and devices supplied.		

Lustre or any open source parallel file system appearing in top 25% of 500 list should be installed, configured and integrated with storage system.		
c) Solution should be fully compliant to IPv6 and should work in dual stack IPv4 and IPv6.		
d) If Utkal University requests for OS/software upgrade due to their functionality requirement, the bidder/OEM should reinstall/upgrade the OS, clustering tools and benchmark the HPC followed by re-commissioning at any point of time during the warranty period at no extra cost to the purchaser.		
e) Training for general system administration with documentation (referred to Section II, 4) including tasks such as user/node management, installation/upgrade, queuing system management, Parallel & CUDA/OpenACCprograming, Deep learning frameworks, ML algo and file system management must be given.		
f) One L3 level trained personnel must be available to help either remotely (8.00 AM to 5.00 PM, 6 Days a week) or NBD onsite for technical support for administration/maintenance (both software and hardware levels) of HPC, with NBD spare parts delivery.		
g) The OEM/Vendor must inform the HPC/IT in-charge of Utkal University prior to any change of the support engineers assigned to any tickets and it is expected that there should not be any change of the support engineers before the completion of ticket(s) assigned.		
h) The Vendor/OEM engineer should visit Utkal University every 90 days and carry out proper hardware & software health check of HPC cluster and submit a report of the same to the HPC/IT in-charge.		
i) The Vendor will be responsible to protect user data during any maintenance in the warranty period.		
j) The OEM/Bidder should have an automated ticketing system with a dedicated helpdesk email account which is regularly monitored and it should be available to Utkal University users.		
k) An escalation matrix for issues not resolved by the support personnel, with an expected timeline, should be clearly mentioned.		

l) The person should have enough experience to handle cluster hardware and software troubleshooting to resolve any problems faced by the users. This should include fine tuning of the scheduler's various capabilities.		
m) The person should be able to produce a required status report of the cluster when asked using the software installed in the cluster to manage it.		
n) The bidder is required to train the designated faculty and students to enable them to effectively operate the total equipment.		

1. Documentation

Documents	Compiled (Yes/No)	Remarks, references
a) User Creation/Deletion/Modification.		
b) Bringing up and shutting down the cluster.		
c) Disk status monitoring of Master/IO nodes and storage enclosure.		
d) Basic troubleshooting for storage, data transfer and job scheduler.		
e) Step by step installation guide for node configuration from scratch as well as clustering of the nodes (both Master and Compute nodes).		
f) When handing over the cluster the vendor should provide the full design of the cluster installation including the electric connections, network connections, user manual clearly explaining how to use the cluster.		

III. A. Terms and conditions:

Items	Compiled (Yes/No)	Remarks, references
a) Any item not specifically mentioned in the specification but is required for successful implementation of the HPC solution (in the opinion of the vendor) must be brought to our notice and quoted accordingly.		

b) All accessories like power cord, mounting rails, fasteners, blank plates, or any other required equipment should be part of the proposal and should be from the OEM. Labeling of servers and storage, data cabling inside rack, dressing of cables is in the scope of work. Only moulded / factory crimped cables will be accepted. Factory assembled fiber and copper patch cords should be considered.		
c) The complete HPCC (High Performance Computing Cluster) solution should be rack compatible.		
d) At the time of installation, if it is found that some additional hardware or software items are required to meet the operational requirement of the configuration, but not included in the vendor's original list of deliverables, the vendor shall supply such items to ensure the completeness of the configuration at no extra cost.		
e) Utkal University reserves the right to increase or decrease the quantity of the items (approx. 20-30%).		
f) Delivery period will be 8 weeks from the date of purchase order issued. Once delivered, the installation, commissioning and acceptance testing period will be within 4 weeks from the date of delivery of the equipment.		
g) The vendor immediately after the award of the work shall prepare a detailed plan of installation as proposed to be followed by placement of the equipment, etc.		
h) Successful bidders have to install operating system, open source software tools, parallel file systems, system administration tools, batch file system, backup software, compilers, libraries etc., test and run the benchmarks and handover the HPCC to concerned engineers. Software to be installed and configured will be conveyed to the successful bidder at the time of installation.		
i) Successful bidders have to install standard benchmarking tools and demonstrate the performance of the complete solution.		
j) All vendors participating in this tender must visit the Utkal University site for a complete site survey and also meet with the Utkal University HPC team in the pre-bid meeting for detailed discussions and clarifications, if any.		

k) The installation should be done by trained engineers from OEM for HPC stack followed by comprehensive user training.		

l) Entire installation should be done at the proposed site only. Remote control of the network will not be given till the commissioning of the HPC.		
m) Give all model numbers of master nodes, compute nodes, hybrid nodes, storage nodes, Network switch model, Accelerator card details (if any), maximum number of ports in IB/OPA switch (if any) and how many ports populated. OEM part code of all the equipment / devices proposed should be provided with the technical bid.		
n) Provide a case logging procedure for both hardware and software failure.		
o) OEM/Bidder is responsible for all performance benchmarks and the quote should contain an undertaking certifying the same from the OEM/Bidder.		
p) As a part of the acceptance test, Utkal University team will check all the software mentioned above, for at least 7 days. Utkal University team will cross-check benchmarking and all other tests based on our input files in the fully offered solution. Apart from this, the bidder has to run and submit Linpack, Lapack, Scalapack benchmark results to the Utkal University team.		
q) All LAN cabling should be done onsite as per the length required using CAT6 (500 MHz or more) or CAT7. All cabling should be done to provide efficient air circulation and should not block any air circulation behind the servers.		
r) Air flow for the complete HPCC solution should be from front to back.		
s) Bidders have to submit heat load and power consumption, for each individual item, of the complete solution under full load condition and total rack space required. Please specify the heat dissipation (in BTU) and max power consumption of each component when configured with the above configuration. The bidder has to visit the installation site and provide the plan, cluster rack arrangement and cooling requirements for hosting the HPC in the given place.		

t) All the proposed equipment should have redundant power supply as specified under each item with 80+ Gold or higher efficiency and should be sized for 100% continuous load.		
u) Chassis with redundant power supply and all accessories should be part of the solution for half width servers and power supplies of all equipment should be rated for 100% continuous duty cycle.		
v) All the required LSZH CAT6 (500 MHz or more) or CAT7 Patch cables, Patch panels, and IOS should be branded (Panduit, Tyco AMP, Systimax). It should withstand the heat produced at the back of the servers.		
w) Itemized price list of each hardware item, software bundle, service and warranty is to be given separately and clearly.		

B. Service Level Agreement:

Agreements	Bidder Compliance
a) In the event of a failure of any of the sub-systems or components of the proposed solution, the bidder has to ensure that the defects are rectified within 72 hrs.	
b) Failure to meet the above requirement will result in extension of the warranty services by 3 days for delay of each day during the warranty period.	
c) The supplier's technical team on 8 x 6 (hrs x days) should register the service call and take immediate action. If need arises, engineers should visit the site to resolve the problem. Utkal University must have the privilege to open service tickets directly on the OEM support portal. Any configuration changes or enabling of built-in features on the devices should be serviced by the supplier's team / OEM during period.	
d) For Deep learning & Machine learning, support for opensource frameworks & algo is must. It should be from the OEM directly and should be resolved within defined SLA time. Total downtime in a year should not be more than 120 hrs. Exceeding this time will result into a penalty of 0.5% of the P.O. value which will be recovered from the PBG (Performance Bank Guarantee). Therefore, the bidders along with the OEMs have to put systems and processes in place to address the above during the period of the contract.	

e) The entire solution is to be implemented in 12 weeks' timeline from delivery to commissioning. Delay in delivery will have a penalty as per university rules. Utkal University reserves the right to cancel the order if it is not deployed even after that. Delay due to Utkal University will not be considered for computing penalty.	

Computer Software (Academic Licence) for HPC

Sl. No.	Items
1	**HPC Software** Red Hat Enterprise Linux Server for HPC Head Node with Smart Management, Premium (Physical or Virtual Nodes), Red Hat Enterprise Linux Server for HPC Compute Node with Smart Management, Premium (Physical or Virtual Node), Linux Server for HPC IO Node with Smart Management, Premium (Physical or Virtual Node), 24X7 support, HA Deployment. Cluster Management Software with GUI web based Management & Monitoring, Job Scheduler Software, Load Sharing Facility (LSF) PBSPro, Intel C/C++, Intel Fortran Compilers and Parallel Libraries GUI Portal for Job Submission
2	ENVI & IDL latest version for 16 compute nodes HPC
3	Vienna Ab initio Simulation Package (VASP): atomic scale materials modelling from first principles (latest version) for 16 compute nodes HPC
4	WIEN2k to perform electronic structure calculations of solids using density functional theory (DFT) (latest version) for 16 compute nodes HPC
5	Synopsys QuantumATK- Materials and Device Simulation (with NEGF) - Academic Bundle with all modules (latest version) for 16 compute nodes of HPC
6	BIOVIA Materials Studio: An integrated, multi-scale modeling environment with all modules (latest version) for 16 compute nodes of HPC
7	AOMix, software for molecular orbital and electron population analysis (latest version) for 16 nodes of HPC
8	Gaussian with TCP Linda support (latest version) for 16 compute nodes of HPC and GaussView (latest version) for single node
9	NBO, Binary distribution and NBOView, Natural Bond Orbital analysis and visualisation of Orbitals, (latest version) for 16 compute nodes of HPC
10	Matlab parallel server (latest version) that can be used in 16 compute nodes of HPC with network licence (single user)
11	gridMathematica (latest version) that can be used for 16 compute nodes of HPC with network licence (single user)
12	Schrödinger Software with all modules (latest version) for 16 computenodes of HPC

Computer Software (Academic Licence) for Utkal University

Sl. No.	Items
1.	SPSS software (latest version)
2.	Microsoft
3.	Microsoft 365
4.	Origin (for Windows and Linux OS)
5.	ChemDraw (for Windows and Linux OS)
6.	Graphpad Prism (for Windows and Linux OS)
7.	Adobe Photoshop
8.	BioRender
9.	Inkscape
10.	EndNote
11.	Discovery Studio

51. BACTERIOLOGICAL INCUBATOR

- Excellent for usage in Microbiological Labs.
- Triple walled in construction with Inner made of Stainless Steel – 304
- Grade & Exterior of CRCA steel with powder coat finish.
- Interior made of Stainless Steel – 304/316 grade and Exterior of
- Stainless Steel 304 grade matt finish in all GMP MODELS.
- High density glass wool insulation between walls to Prevent heat dissipation.
- A fully insulated door with sturdy S. S. hinges and S. S. Latch Handle lock.
- Food grade Silicon Rubber gasket which acts as a perfect sealant.
- A transparent full length Acrylic inner door is provided to have a clear inner view of the samples/specimens put in, without disturbing the thermal Conditions inside the incubator.
- Heating elements are made of high grade Nichrome wire and placed at the both sides.
- Temperature controlled by Dual Display Microprocessor based PID
- Temperature Controller & PT – 100 sensor.
- Air circulation by motorized blower placed on top of the oven.
- Left & Right sides of the inner chamber are duly perforated for proper
- Air Circulation & to maintain uniform Temperature within the chamber.
- Available with removable SS Rod shelves.
- Temperature Range: 5°C above ambient to 60°C.
- Temperature Accuracy: ± 1°C or better.
- Operates on 230 Volts AC Single phase 50 Hz.
- Chamber size: 18″ X 18″ X 18″ (90 LTRS)
- Power consumption: 400watt
- No. of shelves: 3 NOS.
- Warranty: 3 years

52. CYCLOMIXER

- Make and model-To be quoted
- Run Type : Speed Regulator
- Warranty : 1 Year

53. MAGNETIC STIRRER WITH HOTPLATE

- Make and Model- to be quoted
- Accurate step less speed controller, PMDC motor for higher torque even at low speeds.
- Excellent speed control stability with digital speed indicator.
- Top housing-stainless steel
- Teflon Bead should be provided.
- Stirring Capacity-2 litre, 4 litre.
- Heating Capacity-300 W with temperature control.
- Warranty-1 year

54. MICRO-HOMOGENIZER (HAND-HELD)

- Ideal for micro processing in 0.5 ml, 1.5 ml and 2.2 ml micro tubes.
- Volume- 0.03 ml-2 L
- Ideal for RNA/DNA extraction.
- Easy change of homogenizer generators.
- Foam-reducing design
- Dimensions: To be quoted
- Speed Range: 5,000 - 30,000 rpm
- Sample Volume: 0.03 ml - 2 L
- Foam-reducing design
- Dimensions: To be quoted
- Speed Range: 5,000 - 30,000 rpm
- Sample Volume: 0.03 ml - 2 L
- Speed/Control: Analog; Variable Speed
- Generator for Sample Range of volume
- 1.5-100 ml
- 0.1-10 ml
- Warranty- 1year

55. PLANT GROWTH CHAMBER

Specification

- The chambers are designed using high-grade stainless steel of 14 Cu. Ft. or more and advanced techniques to remain with international standards and norms.
- Chambers should be corrosion resistant,Double walled, Inside SS.
- Plant Growth Chamber for researcher access to world climatic conditions whilst eliminating the variability found in nature.
- Inner chamber with 3/4 nos. perforated stainless steel shelves.Users can select the number of illuminated shelves to be fitted inside the chamber.
- Double door, inner made of thick transparent full view glass
- A full range of '**day-night**' cycles with control of temperature light levels and humidity should be available.
- Plant Growth Chamber should be suitable for tall plants up to 1.3m in growing height and optionally up to 620 µmol m^{-2} s^{-1} in light intensity.
- The temperature range of the chamber is +5°C to +40°C, accuracy of +0.50°C. Day and night regulation system should be there. Electronically controlled by Digital temperature Indicator cum Controller with time delay relay
- Automatic 24-hr programming with timer, sliding glass doors for easy viewing, fluorescent and three incident lamps for various light levels. Microprocessor based Programmable Timer for maintaining light on/off cycle
- Two interior electrical outlets should allow use of other equipment, main power switch, lamp switch, heater output, fan, thermostat and programmer switches feature on/off indicator lights

- No of electrical sockets required for installation and other modification at the place of installation should be mentioned.
- Warranty – 3 years

56. MULTIPARAMETER WATER QUALITY SONDE/ PROBE

a. pH

- Range -0.00 to 14.00
- Resolution – 0.01
- Accuracy – ±0.02
- Calibration – Automatic one, two or three points with automatic recognition of five standard buffers

b. ORP

- Range –±2000 mV
- Resolution – 0.1 mV
- Accuracy – ±1.0 mV
- Calibration – Automatic at one custom point (relative mV)

c. EC

- Range - 0 to 200 mS/cm (absolute EC up to 400 mS/cm)
- Resolution – Manual
- Accuracy – ± 1% of reading or ±1 µS/cm whichever is greater
- Calibration – Automatic single point, with six standard solutions

d. TDS

- Range - 0 to 4,00,000 ppm (mg/L)
- Resolution – Manual
- Accuracy – ± 1% of reading or ±1 ppm (mg/L)
- Calibration – Based on conductivity or salinity calibration

e. SALINITY

- Range - 0 to 70 PSU
- Resolution – 0.01 PSU
- Accuracy – ± 2% of reading or ± 0.01 PSU
- Calibration – Based on conductivity calibration

f. RESISTIVITY

- Range - 0 to 9,99,999 Ω.cm; 0to 1000 kΩ.cm; 0 to 1 MΩ.cm
- Resolution – dependent on resistivity reading
- Calibration –Based on conductivity calibration

g. DISSOLVED OXYGEN

- Range - 0 to 500 %; 0 to 50 ppm (mg/L)
- Resolution – 0.1 %; 0.01 PPM (mg/L)
- Accuracy – 0 to 300 % saturation
- Calibration – Automatic one or two points at 0 and 100% or one custom point

h. TURBIDITY

- Range - 0.0 to 99.9 FNU; 100 to 1000 FNU
- Resolution – 0.1 FNU from 0.0 to 99.9 FNU; 1FNU from 100 to 1000 FNU

- Accuracy – ± 0.3 FNU or ± 2% of reading, whichever is greater
- Calibration – Automatic one, two or three points at 0, 20 and 200 FNU or custom

i. TEMPERATURE

- Range – -5 to 55 °C, 23 to 131 °F, 268.15 to 328.15 K
- Resolution – 0.1 K, 0.01 °C, 0.01 °F
- Accuracy – ± 0.15 °C; ± 0.27 °F; ±0.15 K
- Calibration – Automatic at custom point

j. AMMONIUM

- Range - 0.02 to 200.00 ppm (as NH_4^+- N)
- Resolution – 0.01 ppm to 1 ppm, 0.1 ppm to 200 ppm
- Accuracy – ±5 % reading or 2 ppm
- Calibration – One or two point, 10 ppm and 100 ppm

k. CHLORIDE

- Range - 0.6 to 200.0 ppm CI (as CI -)
- Resolution – 0.01 ppm to 1 ppm, 0.1 ppm to 200.0 ppm
- Accuracy – ±5% of reading or 2ppm

l. NITRATE

- Range - 0.62 to 200.0 ppm Ni (as NO_3^- -N)
- Resolution – 0.01 ppm to 1 ppm, 0.1 ppm to 200 ppm
- Calibration – one or two point,10 ppm and 100 ppm

IP PROTECTION: IP67
GPS: 12 channel receiver 10 m (30 ft) accuracy including software
LENGTH OF PROBE: 4m
BATTERY LIFE: Depending upon the configuration, type C, rechargeable
ENVIRONMENT: Can be operated in harsh condition, temperature range: 0°C to 50°C
WARRANTY: 3 Years

57. ULTRASONICATOR BATH

- Cleaning the glassware, lab instruments. Dissolve and disperse and emulsify samples.
- Capacity – 4 to 6 litres
- Body – Stainless Steel
- Electric Supply – 170-245V; A.C., 50 Hz 1 phase
- Warranty – 3 years

58. DC / RF MAGNETRON SPUTTERING SYSTEM

The DC / RF Magnetron sputtering specification

1) Ultra high vacuum chamber 650 mm Dia X 650mm cylindrical **High Vacuum Chamber** with number of ports acts as sputtering chamber. It houses all the magnetron cathode, substrate holder, thickness monitor and other gadgetories etc. The chamber has number of ports and all the ports to be provided with matching flanges and fitted with Viton 'O' ring gaskets to achieve 1 x 10^{-9} mbar in **vacuumchamber**.
2) Target Loading / Unloading: Proper Pneumatic system will be provided to lift the top lid for target loading / Unloading.
3) High vacuum pumping system with **400 lit/sec** turbo pump with controller backed by 15I vacuum pump, valves, pipeline, vacuum measuring gauges etc. to achieve 1 x 10^{-9} mbar in **chamber** with motorized throttle valve for automatic pressure control.
4) Valves **:** uhv gate valve, Roughing and Backing Valves and Solenoid Valves
5) Pressure Gauges: Sufficient number of gauges for trucking the pressure (from atmosphere to 10^{-9} Torr) in chamber, load-lock and pumping lines during pump down and during sputtering.
6) Four sources with individual
7) RF Power supply, 300 Watt, 13.56 MHz RF power supply with auto matching network to be provided for 4 and 3".
8) DC Power supply, 2 kw. Pulse DC -1 No
9) Substrate holder with Substrate Heater 600 Deg. C and rotation
10) Substrate holder plate for mounting the substrate for downward, sequential sputtering, heating of the substrate up to 350degree C coupled with Thyristor, PID, thermocouple etc and substrate holder is cooled by circulating chilled water for cooling the platform. The substrate holder also has rotation with indexing facility driven by a DC motor.
11) Mass flow controller with display unit with necessary valve, pipeline etc. will be provided to feed Argon, Nitrogen/ Oxygen and the flow meters calibrated for the gases respectively upto 0 – 100 sccm.
12) Water Chiller: closed-loop chiller with +/- 10 C temperature stability to be provided. Water chiller must compatible for the sputtering system, and must be capable for supporting the sputtering unit for 12 hours continuously. Water Chiller with temperature control for all cooling needs of the system.
13) Control console with standard safety interlocks and mounting stand for the smooth operation of the RF DC sputtering unit.
14) SCADA Based system

A brief description of the main components is given below.

HIGH VACUUM CHAMBER:

PUMPING SYSTEM FOR HIGH VACUUM AND MAIN CHAMBER:-

Turbo Based system with Peiffer or Edwards

PUMP WITH CONTROLLER: 400 l/s

Varian/ Edwards/ Pfeiffer/ Leybold make turbo pump with controllerfor the evacuation of the main chamber.

The specification of the turbo pump is given below:

Technical data:

Inlet flange size	VG150 ISO160F ICF203
Backing port size	KF40
Pumping speed N2	600 Litres/second
Pumping speed H2	800 Litres/second
Compression ratio N2/H2	>108 / 1x103
Ultimate pressure	10-7(10-9) Pa (Torr)
Allowable backing pressure	266 (2) Pa (Torr)
Max gas flow N2 *1 (water cooled only)	4700 (7.94) sccm (Pa m3/sec)
Max gas flow Ar *1 (water cooled only)	1800 (3.04) sccm (Pa m3/sec)
Rated speed	36,500 rpm
Starting time	<8 minutes
Mounting position	Any orientation
Input voltage	200-240 V
Max input power	750 VA
Weight	48 kg

Rotary Vacuum Pump : <u>15i Pump Specification:</u>

Nominal rotational speed	1800 rpm
Displacement	17.1 m^3h^{-1} / 10.1 ft^3min^{-1}
Peak pumping speed	15.1 m^3h^{-1} / 8.9 ft^3min^{-1}
Ultimate vacuum (total pressure)	0.007 mbar / 0.005 Torr
Minimum standby rotational speed	1200 rpm
Speed control resolution (percentage of fullrotation speed)	1%
Pumping speed at minimum rotational speed	9.9
Maximum continuous inlet pressure	200 mbar
Motor power 1-ph	300 W
Power connector 1-ph	IEC EN60320 C13
Recommended fuse	10A, 250Vac rms
Weight	25.2 kg / 56 lb
Inlet flange	NW25
Exhaust flange	NW25
Noise level	52 dB(A)
Vibration at inlet flange	< 4.5 mms^{-1} (rms)
Leak tightness (static)	< $1x10^{-6}$ mbar ls^{-1}
Operating temperature range	10 to 40 °C / 41 to 104 °F

DIGITAL VACUUM MEASURING GAUGE:

Microprocessor based digital pirani-penning combined gauge to measure the vacuum from atmosphere to 10 (-9) mbar. with necessary gauge heads. It essentially consists of 2 nos. of pirani gauge heads capable of measuring vacuum from atmosphere to 10(-4)mbar. and penning ionisation gauge capable of measuring vacuum from 10(-2)mbar to 10(-9)mbar. All the gauge heads to be supplied with 5 Meter long connecting cables.

GATE VALVE:

Electro-operated gate valve to be provided between the turbo pump and the sputteringchamber.

ROUGHING AND BACKING VALVE:

These valves are 2" size electro operated quarter swing RAV acts as roughing of the chamber and the backing of the turbo pump.

SOLENOID OPERATED VENT VALVE:

Mains operated quarter inch vent valve to be provided to vent the chamber to atmosphere.

MAGNETRON CATHODE: Gencova are Equilvent

There are 4 nos. of 3 inch magnetron cathode mounted in the top flange of the main sputtering chamber in sputter down mode. Each of the magnetron cathodes are of 4" size and they are in directly water-cooled i.e. the magnet does not see the water at all andthere by ensures long life of the magnet.

These magnetrons must be from Angstrom Sciences / Equivalent. The Magnetron has the following specification.

Mode	: Both RF and DC sputtering
Size of the Magnetron	: 3 Inch
Quantity	: 2 Nos.
Target holder	: SS
Target geometry	: Circular / planar
Maximum current	: 5 Amps
Type of magnet	: Sm- Co
Bakeout temperature	: 180^0C

300 RF POWER SUPPLY:

Thespecification of the RF power supply is as follows:

Power Output	: 300 W maximum.
Frequency	: 13.56 MHz +/- 0.005%.
Output Impedance	: 50 Ohm.
Input	:230 V AC Single phase.

The power supply is coupled with an auto tuner for impedance matching. RF power supply and auto tuner are procured from M/s. Advanced Energy USA / M/s. ENI USA / Advanced Converters, Poland / Hettinger / Equivalent are used for system

integration.

DC POWER SUPPLY: Reputed make similar to RF

Quantity	: 1No
DC Power	: 2 KW maximum
Voltage	: 750 Volt
Operating Current	: Maximum 2 amps
Output variation	: can vary continuous from min. to max.Regulations : 0.1%
Meters	: 2 independent voltage and current meters.

SHUTTER CONTROL

Electro pneumatically controlled shutter to be provided which can be controlled from outsideto isolate the cathode from the substrate.

MASS FLOW CONTROLLER : 3 Nos

Mass flow controller with 4 channels digital display unit of International standard like MKS / Alicat USA /EQUIVALENT to be provided for precise measurement of gas flow during sputtering.

SUBSTRATE HOLDER WITH HEATING, AND ROTATION FACILITY:

The Substrate stage is mounted from the bottom flange of the main chamber. The substrate is mounted on substrate stage for sequential sputtering. The substrate is heated upto 650^0C by resistance heater coupled with SSR relay, PID, thermocouple etc. The substrate plate has facility for rotating with speed control arrangement and indexing facility.

SUBSTRATE HEATER: 650^0C with high quality PID

SUBSTRATE ROTATAION:

For bringing the substrate below each cathode, the substrate is rotated with indexing facility to bring below each substrate. The speed of rotation is controlled by a geared DC motor. The variable speed is controlled by SCR control.

CONTROL PANEL:

Standing standard 19" industrial rack containing all the electrical switch gears and operating switches and monitoring devices etc. All the power supplies, Power drives, Controllers, Mass flow controllers, vacuum measuring gauges etc, are mounted neatly on a sturdy industrial rack with sturdy caster wheels. Standard system precaution and safety interlocks to be provided in the control console. A mimic diagram with indication to be provided in the control panel to indicate the status of the system. All electrical switch gears to be provided with alarm generation wherever necessary and emergency shut off switch etc. to be provided in the control panel for safe operation of the system.

Control System & Instrumentation Panel

Full manual control with full manual overrides for maintenance, safety and service.

The control and instrumentations are mounted in a standard rack housing all the

electricalcontrol and monitoring and operation of the system. The electrical cabling to and from panel from the main unit to be done through cable trench as per industrial standard. Frame shall be adjustable height for leveling and castors with stoppers for easy movement. Semi-Automated system with PLC and HMI based control system to be provided for the dual chamber deposition system.

PRECUATION & INTERLOCKS

Standard system interlocks to be provided for the Sputtering Unit. The importantinterlocks are as follows.

INSTALLATION : The supplied items will be installed with a trained engineers . However, utilities to be provided.

WARRANTY:

Standard 1 year + 2 years more.

59. SCANNING TUNNELING MICROSCOPE

No	Name of item	Detail Specification	Quantity
1	Scan range (X×Y, Z)	At least (500 nm×500 nm, 200 nm)	NA
2	Current amplifier	**Maximum 100 nA**	NA
3	Imaging modes	Constant current (Topography) Constant Height (Current)	NA
4	Spectroscopy Modes	Current-Voltage Current-distance	NA
5	Lithography modes (optional)	Patterning and Modification	NA
6	Sample size required	Upto 10 mm in diameter	NA
7	Accessories	STM tool set, STM Basic sample Kit (at least HOPG and Au). Pt/Ir wire: 0.25 mm/100 cm Installation and operating software CD, Manual (Both soft and Hard copy)	NA
8	Desktop Computer	The system LED monitor size 19 inch, 8GB RAM, Intel Core i7-6700K processor (8M cach, 4 cores, 8 Threads, 4.00 GHz, 14 nm), and minimum 512 GB Memory space.Software need to be preinstalled and preconfigured in PC on Microsoft windows 10 platform.	01
9	Tip monitoring Camera	Variable LED illumination, Camera:2×2 mm, 1280×1024 pix, Snap on digital USB 2 camera: see side view image in PC control software window and show side view images with became for demonstrations, Capture video or image for documentation	01
10	Vibration Isolation System	Active isolation in all possible degrees of freedom, Independent of load adjustments, Small and compact design Isolation starts from 1.0 Hz or less	01
11	Software updates	Future updates with free of cost	NA
12	Warranty	Standard 1 year + 2 years more	NA

60. TWO STATION PLANETARY BALL MILLING MACHINE

S. No.	Item	Specification
1	**Two Station Planetary Ball Milling Machine along with all accessories**	**Machine Type: Two Station Planetary Ball Milling Machine alongwith all accessories** Number of Grinding Station: Two Grinding Station should becapable of grinding and mixing simultaneously.
		Jar rotational speed: – Jar should be capable of rotatingmaximum up to 1200 rpm
		Multi-operational system design for application: - The systemshould be capable of size reduction, pulverizing, mixing, homogenizing, and mechanical alloying.
		Field of application: -Agriculture, Biology, Chemistry, Construction materials, Engineering / Electronics, Environment /Recycling, Geology / Metallurgy, Glass / Ceramics, Medicine /Pharmaceuticals
		Feed material: -Soft, Hard, Brittle, Fibrous - dry or wet
		Material feed size: - <10 mm
		Final fineness: -in nano range
		Type of grinding jars: -Regular operation, Optional aerationcovers, Safety closure devices
		Grinding jar sizes: -Should be capable to hold 25 ml / 50 ml / 80ml / 125ml / 250 ml / 500 ml
		Setting of grinding time digital: -00:00:01 to 99:59:59
		Interval operation: - yes, with direction reversal
		Interval time: - 00:00:01 to 99:59:59
		Pause time: - 00:00:01 to 99:59:59
		Measurement of input energy possible – yes
		Required essential accessories with machine: -Grinding Jar Tungsten carbide 125 ml – 2 No. Grinding Jar Stainless Steel 250 ml -2 No. Grinding Balls: 1. Stainless Steel 5mm , 500pcs 2. Stainless Steel 10mm , 50pcs 3. Tungsten carbide 5mm , 200pcs 4. Tungsten carbide 10mm , 50pcs
		Grinding Jar O-ring of 125 ml, and 250ml- 10 Nos.
		Aeration lid for Inert Atmosphere mixing. User defined labeling: - The jar should be provided with identification marks indicating the item number, material andvolume to facilitate easy traceability. Space should also be available for user defined labeling.

		Diameter of main disk: - Should be in the range 150-160mm Rotational speed ratio: - The ball mill should consist of rotating base plate on which bowl could be firmly fixed, and it should becapable of rotating about its own axis with planetary action with speed ratio: 1: 2 Speed changing capability: -Should be possible to continuously increase the speed of rotation of the base plate and the bowls.The base plate should have RPM in the range of 100-700/min Clamping of bowls: -Bowls should be capable of being firmly fixed on the rotating platform so that they are capable of rotating about their axes and are not thrown of accidently. Thesystem should have provision for easy clamping device for tightening these bowls User safety: -The rotating parts shall be fully enclosed, and a safety locking system be provided such that the motor can bestarted only if the enclosure is placed firmly in position. Input electric power: -The offered system should work on 230V,50Hz, single phase power. Motor: - should be AC drive and of minimum 1200 to 1300watts power. Operational speed: - It should be possible to run the equipment/mill in a sequence of operation such as slow start tomaximum speed, and a set time of rotation. Cooling during operation: - To enhance the performance of thesystem for continuous operation, suitable fans should be provided in the system to avoid over heating Power backup: - Power failure backup that ensures interruptmixing. **NOTE:** Warranty period of not less than 2 years to be clearly mentioned and should begin from the date of installation.

61. REAL TIME QUANTITATIVE PCR

- Make and Model to be quoted
- The system should be automated integrated 96 well peltier based for both real-time PCR and post-PCR (end-point) analysis with 6 independently controlled zones.
- It should have interactive touch screen LCD for standalone operation with 8 - 10GB onboard memory for storage of at least 1600 - 2000 runs.
- System should support minimum recommended reaction volume of 10–30 µL/10–100 µL for 0.1/0.2 mL block.
- The Quoted System Should support the temperature range from 4^0C to 99^0C with block ramp more than 6 DegC/sec, and run time less than 40 minutes.
- System should have six de-coupled excitation and emission filter sets to enable collection of up to 21 unique combinations of wavelengths during a single run for multiplexing five colors or above.
- The light source should be bright white LED with life span of more than five years and detection by CMOS/CCD with whole plate imaging and detection.
- Factory pre-calibrated system for the dyes: FAM/SYBR Green, VIC/JOE/HEX/TET, ABY/NED/TAMRA/Cy3, JUN, ROX/Texas Red, Mustang Purple, Cy5/LIZ, Cy5.5.
- The PCR system should be capable of performing the applications such as Gene Expression, Genotyping, Copy Number Variation, Pathogen Detection, Strain Typing, and Viral Load, Mutation Scanning, Methylation and other Epigenetic Applications, miRNA profiling, Protein analysis with proximity ligation assays and Protein Thermal Shift technology.
- Features to assist with 21 CFR part 11compliance Security, auditing and e-signature, CE, ISO, and MIQE compliant.
- System should detect differences in target quantity as small as 1.5-fold in single plex reactions, and should have 10 logs of linear dynamic range.
- Single-plate analysis Absolute and relative gene expression, SNP genotyping, presence/absence, high resolution melt, Multiplate analysis Gene expression studies, SNP genotyping studies.
- The normalization of reaction due to non-PCR related fluctuations should be possible by using any calibrated dye.
- The system can be connected to the online ecosystem and instrument data/status will be automatically uploaded, allow users to access and securely share result with colleague anywhere, anytime from any location with internet access
- The PCR system should be provided with dedicated Data Analysis Software and other software required for calibration along with the system.
- Necessary Desktop system with Core i7, 16GB RAM,64 bit Win10 or 11, 2TB SSD, 32 inch monitor should be provided with the Licensed PRIMER designing and analysis software.
- Online 2 KVA UPS with 30 min back up.
- Three year Comprehensive Warranty.

62. TWO-DIMENSIONAL (2D) ELECTROPHORESIS WITH IMAGE ANALYSIS

Specifications

- Make and Model to be quoted
- Electrophoresis setup with automated 1st dimension IEF system, Mini and midi 2nd dimension systems, Image Doc and 2D analysis software with accessories. Provision of gel Cooling system
- **Isoelectric focusing Unit**: Capacity IEF: up to 12 IPG strips up to 12 IPG strips can be run simultaneously, with strip lengths up to 24 cm.
- Operating conditions: 4–40 °C
- Humidity: 20–95%
- Maximum power: 100 W
- Maximum voltage: 3500 Vp-p (+ 1750 V with reference to ground)
- Cooling plate: Aluminium oxide, 21 × 27 cm (l × w)
- Maximum pressure: 0.5 bar on cooling plate
- Dimensions to be quoted
- **Power Unit**: Power requirements 100–120 V/220–240 V, 50/60 Hz, 260 W; Current resolution 1 μA
- Programmable parameters: Current 1–400 mA; Voltage 35–3 500 V, 5V increments; Power 1–200 W; Timer, run end 1 min-500 h (continuous),1Vh–500 kVh,1 mAhr–25 Ahr;
- Safety features: overload/short circuit protection, ground leakage detection, no-load detection
- **Thermostatic Circulator**: Working temperature 10–90 °C range; Operating temperature range 4–40 °C; Temperature control < ± 0.1 °C at 20 °C constancy; Range of temperature limit switch 20–95 °C; Heater capacity 800 W; Cooling capacity, 240 W at 20 °C, 200 W at 5 °C; Compressor coolant KLEA 134a (Specifications for 20 °C ambient temp.); Bath volume 3 liters; Pump capacity, ≈ 0.32 bar pressure; Pump capacity, ≈ 12 litres/min flow rate; Pump capacity, ≈ 12 litres/min flow rate; Maximum operating humidity: 80% at 31 °C; ambient humidity 50% at 40 °C
- Other specifications: System should compatible for different applications 1) Ethidium bromide/florescent staining of gels 2) White: Coomassie Brilliant Blue dye, copper, silver, and zinc stains for protein 3) New advance applications for without stain imaging.
- Software for 2D analysis
- 1KVA UPS with 30 minutes backup
- Branded laptop/Desktop should be provided with system.
- Warranty: 3 years

63. WESTERN BLOTTING SYSTEM WITH POWER PACK

Specifications

- Packs include an optimized buffer, membrane, and filter paper combination
- Rapid blot transfer — 3 min transfers of mini or midi gels
- Integrated power supply with blotting Software and the blot Cassette (for blotting)
- High throughput —transfer 1–4 mini or 1–2 midi gels in a single run. Greater transfer efficiency
- Flexible design : customize transfer conditions that is compatible with traditional semi-dry consumables
- Blotting instrument, includes base, 2 cassettes to hold 1–2 midi blotting sandwiches, blot roller, midi nitrocellulose transfer pack, and starter consumable kit
- High Voltage Power Pack
- Voltage: 20–5,000VCurrent: 0.01–500 mA Power: 1–400 W Type of output: Constant voltage, constant current, constant power, or constant temperature
- Timer control: 1 min–99 hr 59 min, fully adjustable Volt-hour control: 99,000 V-hr Pause/resume function: Yes,
- Display: 128 x 64 pixel, yellow-green backlit graphics LCD Programmable methods : Stores up to 9 basic and 9 IEF methods, each with up to 9 steps Real-time clock: Yes
- Automatic recovery after power failure: Yes
- Temperature control: Yes, via temperature probe; 30–90°C ±2°C
- Safety features: No-load detection; rapid resistance change detection, ground leak detection, overload/short circuit detection, overvoltage protection, over-temperature protection
- Operating conditions:0–40°C; 0–95%humidity in absence of condensation Number of output jacks: 4 sets in parallel
- Safety complianceEN61010IQ/OQ protocols : Yes
- Input power (actual): 90–120 or 198–264 VAC, 50 or 60 Hz,
- auto switching Dimensions (W x D x H), cm/in: 7.5 x 34 x 10/3 x 13.4 x 3.9
- Three Years comprehensive warranty with 2 more years free AMC