TWO BID OPEN TENDER DOCUMENT

FOR

PROCUREMENT OF SCIENTIFIC EQUIPMENT / INSTRUMENTS FOR
CENTRE FOR EXCELLENCE / DEPARTMENTS / CENTRAL
INSTRUMENTATION CENTRE, UTKAL UNIVERSITY

Tender No. DRS/RUSA-1041-2016 (Equipment)/25237/2019
dated the 11 September 2019

Last date of submission of Tender:
18 October 2019 at 1600 hours

Tender Paper can be downloaded from
www.utkaluniversity.nic.in

For any information, other modifications and / or corrigendum may,
kindly, visit the above website
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INDICATIVE NOTICE INVITING TENDER

Two bid sealed tenders are invited from manufacturing firms / authorized dealers having VAT / GST clearance, PAN/TAN certificate for supply, installation and commissioning of the different scientific instruments / equipment for Central Instrumentation Facilities (CIF) and different post-graduate departments and Centres of Excellence (CoEs) of Utkal University by 18 October 2019 at 4.00 PM. The tender document and details of terms and conditions can be downloaded from the University website www.utkaluniversity.nic.in from 11 September 2019 at 6.00 PM. The date and time of pre-bidding and opening the technical bid are 23 September 2019 at 3.00 PM and 19 October 2019 at 3.00 PM in the Syndicate Hall, Utkal University. The authority reserves the right to accept / negotiate / reject any or all the tenders and modify the conditions / specification at any stage without assigning any reason thereof.

Memo No. DRS/RUSA-1041-2016 (Equipment)/25238/2019 dated the 11 September 2019

Copy to
1. The Chairperson, PG Council, Utkal University;
2. The Comptroller of Finance, Utkal University;
3. The Director, R&D, Utkal University;
4. The OSD, New Campus, Utkal University;
5. The PS to the Vice-Chancellor, Utkal University; and
6. The Coordinator, RUSA 2.0, Utkal University
for information and necessary action

Memo No. DRS/RUSA-1041-2016 (Equipment)/25239/2019 dated the 11 September 2019

Copy to
1. Professor-in-Charge, Computer Centre, Utkal University for uploading in the University website for information of all concerned.
2. M/S Mint Interactive LLP, 3B1, Bishnupriya Apartments, Jaydev Vihar, Bhubaneswar – 751 013 (Phone: 0674-2361430, Mob. 94370 34055, E-mail: mintactive@gmail.com) with a request to publish the advertisement in one issue of the Times of India (All Edition), the Samaj, the Prameya, and the Dharitri at the I&PR rate of Government of Odisha (with the trade discount) and to submit the bills in triplicate for payment.
3. Copy to the Notice Board, Utkal University for general information.
## SECTION I: IMPORTANT INFORMATION

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<tbody>
<tr>
<td>1.</td>
<td><strong>Type of Tender</strong></td>
<td><strong>Two Bid Open Tender System</strong></td>
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<td>2.</td>
<td><strong>Tender No.</strong></td>
<td><strong>DRS/RUSA-1041-2016 (Equipment)/25237/2019</strong></td>
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<td>3.</td>
<td><strong>Tender Date</strong></td>
<td><strong>11 September 2019</strong></td>
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<td>4.</td>
<td><strong>Item Description</strong></td>
<td><strong>Annexure</strong></td>
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<td>5.</td>
<td><strong>Place of Submission</strong></td>
<td><strong>RUSA Cell, Utkal University</strong></td>
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<td><strong>Vani Vihar, Bhubaneswar</strong></td>
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<td><strong>Odisha, India, PIN: 751 004</strong></td>
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<td>6.</td>
<td><strong>Place of Opening the Tender Papers</strong></td>
<td><strong>Syndicate Hall, Utkal University</strong></td>
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<tr>
<td>7.</td>
<td><strong>Indenter(s) / Technical Clarifications</strong></td>
<td><strong>Professor Jagnehswar Dandapat</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>E-mail: <a href="mailto:jdandapat.nou@gmail.com">jdandapat.nou@gmail.com</a></strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Contact: +91 94374 66087</strong></td>
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<tr>
<td></td>
<td></td>
<td><strong>Dr. Prafulla Kumar Panda</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>E-mail: <a href="mailto:prafulla.k.panda@gmail.com">prafulla.k.panda@gmail.com</a></strong></td>
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<tr>
<td></td>
<td></td>
<td><strong>Contact: +91 96923 75901</strong></td>
</tr>
<tr>
<td>8.</td>
<td><strong>Any other clarification</strong></td>
<td><strong>RUSA Cell</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>E-mail: <a href="mailto:rusa.utkal@gmail.com">rusa.utkal@gmail.com</a></strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Mobile: +91 94371 00813</strong></td>
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<tr>
<td>9.</td>
<td><strong>Other Conditions</strong></td>
<td><strong>Earnest Money Deposit of 2.5% of the total financial bid must be enclosed in a separate sealed envelope. Tenders not accompanied with prescribed EMD are liable to be rejected. The successful bidder shall submit a Performance Security @ 15% of the cost of the equipment.</strong></td>
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### CRITICAL DATE SHEET

<table>
<thead>
<tr>
<th></th>
<th><strong>Particulars</strong></th>
<th><strong>Date and Time</strong></th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Date of Publication of Tender</td>
<td>11 September 2019, 1700 hours</td>
</tr>
<tr>
<td>2.</td>
<td>Bid Document Download</td>
<td>11 September 2019, 1800 hours</td>
</tr>
<tr>
<td>3.</td>
<td>Seek Clarification Start Date</td>
<td>11 September 2019, 1900 hours</td>
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<tr>
<td>4.</td>
<td>Seek Clarification End Date</td>
<td>21 September 2019, 1500 hours</td>
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<td>5.</td>
<td>Pre-Bid Meeting</td>
<td>23 September 2019, 1500 hours</td>
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<td>6.</td>
<td>Bid Submission Start Date</td>
<td>30 September 2019, 1000 hours</td>
</tr>
<tr>
<td>7.</td>
<td>Last Date of Submission of Tender</td>
<td>18 October 2019, 1400 hours</td>
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<tr>
<td>8.</td>
<td>Opening of Technical Bids</td>
<td>19 October 2019, 1500 hours</td>
</tr>
<tr>
<td>9.</td>
<td>Opening of Financial Bid</td>
<td>28 October 2019, 1500 hours</td>
</tr>
</tbody>
</table>
DISCLAIMER

The information contained in this Tender document provided to the Bidders, by Utkal University, hereinafter referred to as “Utkal”, or any of their employees or advisors, is provided to the Bidder(s) on the terms and conditions set out in this TENDER document.

The purpose of this TENDER document is to provide the Bidder(s) with information to implement “Procurement of scientific equipment/instruments for Centres of Excellence /Departments/Central Instrumentation Centre” for Utkal University, Bhubaneswar. This TENDER document does not purport to contain all the information each Bidder may require.

Each Bidder should conduct its own investigations and analysis and should check the accuracy, reliability and completeness of the information in this TENDER document and wherever necessary obtain independent advice from appropriate sources. Utkal University, their employees and advisors make no representation or warranty and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability or Completeness of the TENDER document.

Utkal University may, in its absolute discretion, but without being under any obligation to do so, update, amend or supplement the information in this TENDER document.
SECTION II: GENERAL INSTRUCTIONS TO BIDDERS (GIB)

A. PREAMBLE

1. Definitions and Abbreviations

1.1. The following definitions and abbreviations, which have been used in these documents shall have the meanings as indicated below:

1.2. Definitions:

a. “Purchaser” means the organization, i.e., Utkal University / Utkal Entrepreneurship and Career Hub (UECH) purchasing goods and services as incorporated in the Tender Document.

b. “Bid” means Quotation / Tender received from a Firm / Tenderer / Bidder.

c. “Bidder” means Tenderer / the Individual / the Firm / the agency submitting Bids / Quotation / Tender

d. “Supplier” means the individual / the firm / the agency supplying the goods and services as incorporated in the contract/purchase order.

e. “Goods” means all articles, material, commodity, livestock, furniture, fixtures, raw material, spares, instruments, machinery, equipment, vehicles, medicines, assemblies, sub-assemblies, accessories, intangible products like software, technology transfer, licenses, patents or other intellectual properties purchased or otherwise acquired for the use of Government but excludes books, publications, periodicals, etc. for a library. The term “goods” also includes works and services which are incidental or consequential to the supply of such goods, such as, transportation, insurance, installation, commissioning, training and maintenance.

f. “Services” means services allied and incidental to the supply of goods, such as transportation, installation, commissioning, provision of technical assistance, training, after sales service, maintenance service and other such obligations of the supplier covered under the contract.

g. “Bid Security” (BS) means Earnest Money Deposit / monetary or financial guarantee to be furnished by a bidder along with its tender.

h. “Contract” means the written agreement entered into between the purchaser and the supplier, together with all the documents mentioned therein and including all attachments, annexure etc. therein.

i. “Performance Security” means monetary or financial guarantee to be furnished by the successful bidder for due performance of the contract placed on it. Performance Security is also known as Security Deposit.

j. “Consignee” means the Utkal University / UECH / Department / Centre / Section / person to whom the goods are required to be delivered as specified in the Contract.

k. “Specification” also called Technical Specifications means the document/standard that prescribes the requirement with which goods or service has to conform.

l. “Inspection” means activities such as measuring, examining, testing, gauging one or more characteristics of the product or service and comparing the same with the specified requirement mentioned in the contract to determine conformity.

m. “Day” means calendar day.

Abbreviations:

1) “BG” means Bank Guarantee
2) “BL” means Bill of Lading
3) “CAMC” means Comprehensive Annual Maintenance Contract (labour, spare and preventive maintenance)
4) “CD” means Custom Duty
5) “CIF” means Cost, Insurance and Freight
6) “CIP (Destinations)” means Carriage and Insurance Paid up to named port of
destination. Additionally, the Insurance (local transportation and storage) would be
extended and borne by the Supplier from warehouse to the consignee site for a
period including three months beyond date of delivery.

7) “DP” means Delivery Period
8) “FOB” means Free on Board
9) “FCA” means Free Carriage Alongside
10) “GCC” means General Conditions of Contract
11) “GIB” means General Instructions to Bidders
12) “GST” means Goods and Service Tax
13) “INCOTERMS” means International Commercial Terms as on the date of Bid
Opening
14) “LC” means Letter of Credit
15) “NIT” means Notice Inviting Tenders
16) “SCC” means Special Conditions of Contract
17) “SIT” means Special Instructions to Bidders
18) “UECH” means Utkal Entrepreneurship and Career Hub
19) “UU” means Utkal University

2. Introduction

2.1. The Purchaser has issued these Tender Documents for purchase of goods and related
services as mentioned in Section VI – “List of Requirements”, which also indicates, _inter
alia_, the required delivery schedule, terms and place of delivery.

2.2. This section (Section II: “General Instructions to Bidders”) provides the relevant
information as well as instructions to assist the prospective bidders in preparation and
submission of bids. It also includes the mode and procedure to be adopted by the bidder
for receipt and opening as well as scrutiny and evaluation of bids and subsequent
placement of contract.

2.3. The bidder shall also read the Special Instructions to Bidders (SIB) related to this
purchase, as contained in Section III of these documents and follow the same
accordingly. Whenever there is a conflict between the GIB and the SIB, the provisions
contained in the SIB shall prevail over those in the GIB.

2.4. Before formulating the bid and submitting the same to the purchaser, the bidder should
read and examine all the terms, conditions, instructions, etc. contained in the Tender
Document. Failure to provide and/or comply with the required information, instructions
etc. incorporated in these Tender Documents may result in rejection of its Bid.

3. Availability of Funds

3.1. Expenditure to be incurred for the proposed purchase will be met from the funds
available with the purchaser / consignee.

4. Language of Bid

4.1. The bid submitted by the bidder and all subsequent correspondence and documents
relating to the bid exchanged between the bidder and the purchaser, shall be written in
the English language. However, the language of any printed literature furnished by the
bidder in connection with its bid may be written in any other language provided the same
is accompanied by an English translation and, for purposes of interpretation of the bid,
the English translation shall prevail.

5. Eligible Bidders

5.1. This Invitation for Tenders is open to all bidder who fulfil the eligibility criteria
specified in these documents.
6. **Eligible Goods and Services**

6.1. 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 the related services are arranged and supplied.

7. **Bid Expense**

7.1. The bidder shall bear all costs and expenditure incurred and / or to be incurred by it in connection with its bid including preparation, submission of its bid and for subsequent processing the same. The purchaser will, in no case be responsible or liable for any such cost, expenditure etc regardless of the conduct or outcome of the Tender process.

**B. TENDER DOCUMENT**

8. **Content of Tender Document**

8.1. In addition to Section I: “Notice Inviting Tender” (NIT), the Tender Document includes:

a) Section II: General Instructions to Bidders (GIB)
b) Section III: Special Instructions to Bidders (SIB)
c) Section IV: General Conditions of Contract (GCC)
d) Section V: Special Conditions of Contract (SCC)
e) Section VI: List of Requirements
f) Section VII: Technical Specifications and General Points
g) Section VIII: Qualification Criteria
h) Section IX: Tender Acceptance Form
i) Section X: Price Schedules / Financial Bid
j) Section XI: Check List
k) Section XII: Bank Guarantee Form for Bid Security
l) Section XIII: Manufacturer’s Authorization Form
m) Section XIV: Bank Guarantee Form for Performance Security / CAMC Security
n) Section XV: Contract Forms A and B
o) Section XVI: Performa of Consignee Receipt Certificate
p) Section XVII: Performa of Final Acceptance Certificate by the consignee

8.2. The relevant details of the required goods and services, the terms, conditions and procedure for Tender, bid evaluation, placement of contract, the applicable contract terms and, also, the standard formats to be used for this purpose are incorporated in the above-mentioned documents. The interested bidders are expected to examine all such details etc. to proceed further.

9. **Corrigendum to Tender Document**

9.1. At any time 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.

9.2. Corrigendum will be notified through [www.utkaluniversity.nic.in](http://www.utkaluniversity.nic.in) only.

9.3. In order to provide reasonable time to the prospective bidders to take necessary action in preparing their bids as per the amendment, the purchaser may, at its discretion extend the deadline appropriately for the submission of bids and other allied time frames, which are linked with that deadline.
10. Clarification of Tender Document

10.1. A bidder requiring any clarification or elucidation on any issue of the Tender Document may take up the same with the purchaser through e-mail to rusa.utkal@gmail.com only. The queries should necessarily be submitted in the following format:

<table>
<thead>
<tr>
<th>Section/Page No</th>
<th>Content of Tender document requiring clarification</th>
<th>Change/Clarification requested</th>
<th>Remarks</th>
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The purchaser will respond through e-mail to such request provided the same is sent within the time schedule mentioned in “Critical Date Sheet”.

C. PREPARATION OF BIDS

11. Documents Comprising the Bid

11.1. The Two Bid System, i.e., “Technical Bid” and “Financial Bid” prepared by the bidder shall comprise the following:

A. Technical Bid (Un-priced Bid)

a) “EMD/Bid Security” furnished in accordance with GIB clause 19.1 alternatively, documentary evidence as per GIB clause 19.2 for claiming exemption from payment of EMD/Bid security.

b) “Technical Specifications Quoted” as per Section VII of Tender Document viz-a-viz technical specification of the quoted equipment.


d) “Tender Acceptance Form” as per Section IX.

e) Scanned copy of “Performance Statement” as per Section VIII along with relevant copies of orders and End Users’ satisfaction certificate

f) GST Registration Certificate.

g) Documentary evidence, as necessary in terms of clauses 5 and 17 of GIB establishing that the bidder is eligible to submit the bid and, also, qualified to perform the contract if its bid is accepted

h) Bidder who quotes for goods manufactured by other manufacturer shall submitted “Manufacturer’s Authorization Form” as per Section XIII. While giving authorization to agent, to quote on their behalf, manufacturer has to give the reasons for not quoting directly against this bid in the Manufacturer’s Authorization Form.

i) Power of Attorney in favour of signatory of Tender/Bid and signatory of Manufacturer’s Authorization Form.

j) Documents and relevant details to establish in accordance with GIB clause 18 that the goods and the allied services to be supplied by the bidder conform to the requirement of the Tender Document.

k) Documents confirming to Sole Proprietorship/ Partnership/Private Limited Firm in the country of origin as the case may be.

Note:

1. It is the responsibility of bidder to go through the Tender Document to ensure submitting all required documents in addition to above, if any.
B. Financial Bid

1. Price Schedule(s) / Financial Bid may be prepared with all the details including Make, Model etc. of the goods offered as per the format provided in Section X.

11.2. The authorized signatory of the bidder must ink sign the bid. Individuals signing the bid or other documents connected with a contract must specify whether he/she signs as:
   i. a “Sole Proprietor” of the firm or constituted attorney of such Sole Proprietor;
   ii. in case of partnership firm/s he/she must have authority to quote and to refer to arbitration dispute concerning the business of the partnership either by virtue of the partnership agreement or a power of attorney;
   iii. Constituted attorney of the firm if it is a company.

Note:
1) In case of (ii) above, a copy of the partnership agreement duly registered with “Registrar of Firms” or general power of attorney, in either case, attested by a Notary Public should be submitted, or affidavit on stamped paper of all the partners admitting execution of the partnership agreement or the general power of attorney should be submitted.
2) In case of the partnership firms, where no authority to refer disputes concerning the business of the partnership has been conferred on any partner, the bid and all other related documents must be signed by every partner of the firm and submitted.
3) Person ink signing the Tender Acceptance Form or any documents forming part of the contract on behalf of another shall be deemed to warrantee that he has authority to bind such other persons and if, on enquiry, it appears that the persons so signing had no authority to do so, the purchaser may, without prejudice to other civil and criminal remedies, liable for rejection of bid or cancel of contract and hold the signatory liable for all cost and damages.

11.3. A bid, which does not fulfil any of the above requirements and/or gives evasive information/reply against any such requirement, shall be liable to be ignored and rejected.

11.4. Bid should be sent by speed post and the same also may be sent by e-mail to rusa.utkal@gmail.com.

12. Bid Currencies

12.1. The bidder supplying indigenous goods or already imported goods shall quote only in Indian Rupees (INR).

12.2. For imported goods if supplied directly from abroad, prices shall be quoted in any freely convertible currency say USD, EUR, GBP, SGD, AUD, CHF, YEN. As regards price(s) for allied services, if any required with the goods, the same shall be quoted in Indian Rupees only, if such services are to be performed/undertaken in India. Commission for Indian Agent, if any and if payable shall be indicated in the space provided for in 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.

12.3. Bids, where prices are quoted in any other way shall be treated as non-responsive and rejected.

13. Bid Prices

13.1. All the columns shown in the Price Schedule / Financial Bid (Section X) should be filled up as required.

13.2. If there is more than one schedule in the “List of Requirements”, the bidder has the option to submit its bid for any one or more schedules. However, while quoting for a
schedule, the bidder shall quote for the complete requirement of goods and services as specified in that particular schedule.

13.3. While filling up the columns 4 of the Price Schedule / Financial Bid, the detailed Unit price arrived should be submitted in a separate sheet and the following aspects should be noted for compliance:

13.3.1. For domestic goods or goods of foreign origin located within India, the prices in the corresponding Price Schedule shall be entered separately in the following manner:
   a) The price of the goods, quoted ex-factory/ ex-showroom/ ex-warehouse/ off-the-shelf, as applicable, including packing charges and GST and Custom Duty already paid or payable on the components and raw material used in the manufacture or assembly of the goods quoted ex-factory etc. or on the previously imported goods of foreign origin quoted ex-showroom etc;
   b) Any taxes and duty, which will be payable on the goods in India if the contract is awarded;
   c) Charges towards Inland Transportation, Insurance (local transportation and storage) would be borne by the Supplier from ware house to the consignee site for a period including three months beyond date of delivery, Loading/Unloading and other local costs incidental to delivery of the goods to their final destination as specified in the List of Requirements and Price Schedule;
   d) The price of Incidental Services (including installation and commissioning, supervision, demonstration and training), at the consignee site as mentioned in List of Requirements, Technical Specification and Price Schedule;
   e) The prices of Turnkey Work (if any), as mentioned in List of Requirements, Technical Specification and Price Schedule; and
   f) The price of CAMC, as mentioned in List of Requirements, Technical Specification and Price Schedule.

13.3.2. For goods offered from abroad, the prices in the corresponding price schedule shall be entered separate sheet in the following manner:
   a) The price of goods quoted on FOB price at port of loading/ FCA price at airport of loading, as mentioned in List of Requirements, Technical Specification and Price Schedule
   b) The amount of Freight and Insurance (port of loading to port of entry) and other incidental costs.
   c) The price of Incidental Services (including Installation & Commissioning, Supervision, Demonstration and Training) at the Consignee’s site as mentioned in List of Requirements, Technical Specification and Price Schedule.
   d) The price of Extended Insurance (local transportation and storage) from port of entry to the consignee site for a period including 3 months beyond date of delivery.
   e) The Unit Price on CIP Name port of Destination + Extended Insurance (local transportation and storage)
   f) The price of total Price on CIP Named port of Destination +Insurance (local transportation on and storage)
   g) The prices of Turnkey Work (if any), as mentioned in List of Requirements, Technical Specification and Price Schedule; and
   h) The price of CAMC, as mentioned in List of Requirements, Technical Specification and Price Schedule.
13.4. Additional information and instruction on Taxes and Duties

13.5.1 GST (Goods and Services Tax)
If the bidder desires to ask for GST (goods and services tax) to be paid extra, the same must be specifically stated. In the absence of any such stipulation, the price will be taken inclusive of GST and no claim for the same will be entertained later.

13.5.2 Custom Duty: The Purchaser will pay the Custom Duty wherever applicable.

13.5. For transportation of imported goods offered from abroad, relevant instructions as incorporated under GCC Clause 10 shall be followed.
13.6. For insurance of goods to be supplied, relevant instructions as provided under GCC Clause 11 shall be followed.
13.7. Unless otherwise specifically indicated in this Tender Document, the terms FCA, FOB, CIF, CIP etc. for imported goods offered from abroad, shall be governed by the rules and regulations prescribed in the current edition of INCOTERMS - 2010, published by the International Chamber of Commerce, Paris
13.8. The need for indication of all such price components by the bidders, as required in this clause (viz., GIB clause 13) is for the purpose of comparison of the bids by the purchaser and will no way restrict the purchaser’s right to award the contract on the selected bidder on any of the terms offered.

14. Indian Agent
14.1. If a foreign bidder has engaged an agent in India in connection with its bid, the foreign bidder, in addition to indicating Indian agent’s commission, if any, in a manner described under GIB sub clause 12.2 above, shall also furnish the following information:
   a) The complete name and address of the Indian Agent.
   b) The details of the services to be rendered by the agent for the subject requirement.
   c) Details of Service outlets in India, nearest to the consignee(s), to render services during Warranty and CAMC period.

15. Firm Price
15.1. Unless otherwise specified in the SIB, prices quoted by the bidder shall remain firm and fixed during the currency of the contract and not subject to variation on any account.
15.2. However, as regards taxes and duties, if any, chargeable on the goods and payable, the conditions stipulated in GIB clause 13 will apply.

16. Alternative Models
16.1. Alternative Models are permitted. The Bidder can quote alternate models meeting the specifications of the Tender document of same manufacturer with single Bid Security.
16.2. If an agent submits bid on behalf of the Principal/OEM, the same agent shall not submit a bid on behalf of another Principal/OEM in the same Advertised Tender Notice for the same item/product. In a bid, either the Indian Agent on behalf of the Principal/OEM or Principal/OEM itself can bid but both cannot bid simultaneously for the same models in the same Advertised Tender Notice.
16.3. One Principal/OEM cannot authorize two agents simultaneously for the same item against same Advertised Tender Notice.
17. Documents Establishing Bidder’s Eligibility and Qualifications

17.1. Pursuant to GIB clause 11, the bidder shall furnish, as part of its bid, relevant details and documents establishing its eligibility to quote and its qualifications to perform the contract if its bid is accepted.

17.2. The documentary evidence needed to establish the bidder’s qualifications shall fulfill the following requirements:

a) In case the bidder offers to supply goods, which are manufactured by some other firm, the bidder has been duly authorized by the goods manufacturer to quote for and supply the goods to the purchaser. The bidder shall submit the manufacturer’s authorization letter to this effect as per the standard form provided under Section XIII in this document.

b) In case the bidder is not doing business in India, it is duly represented by an agent stationed in India fully equipped and able to carry out the required contractual functions and duties of the supplier including after sale service, maintenance and repair etc. of the goods in question, stocking of spare parts and fast moving components and other obligations, if any, specified in the conditions of contract and/or technical specifications.

18. Documents establishing goods’ Conformity to Tender Document

18.1. The bidder shall upload in its bid the required as well as the relevant documents like technical data, literature, drawings etc. to establish that the goods and services offered in the bid fully conform to the goods and services specified by the purchaser in the Tender Document. For this purpose, the bidder shall also upload a clause-by-clause commentary on the technical specifications and other technical details incorporated by the purchaser in the Tender Document to establish technical responsiveness of the goods and services offered in its bid.

18.2. In case there is any variation and/or deviation between the goods and services prescribed by the purchaser and that offered by the bidder, the bidder shall list out the same in a chart form without ambiguity and provide the same along with its bid.

18.3. If a bidder furnishes wrong and/or misguiding data, statement(s) etc. about technical acceptability of the goods and services offered by it, its bid will be liable to be ignored and rejected in addition to other remedies available to the purchaser in this regard.

19. Bid Security (BS) /EMD

19.1. Pursuant to GIB clauses 8.1 and 11.1 A. a) the bidder shall furnish along with its bid, Bid Security for amount as shown in the Notice Inviting Tenders (NIT). It is required to protect the purchaser against the risk of the bidder’s unwarranted conduct as amplified under sub-clause 19.7 below.

19.2. The original Earnest Money/Bid Security must be delivered to address as given in NIT till bid opening date and time as mentioned in “Critical Date Sheet” failing which the bid shall be summarily rejected. The original Bid Security/EMD must be enclosed along with the bid.

19.3. The bidders who are currently registered with MSME for the specific goods as per Tender document specification shall be eligible for exemption from Bid Security as defined in MSE Procurement Policy issued by the department of MSME. In case the bidder falls in this category, the bidder shall enclose relevant certificate of registration issued by department of MSME.

19.4. The Bid Security shall be denominated in Indian Rupees or equivalent currencies as per GIB clause 12.2. The Bid Security shall be furnished in one of the following forms:

a) Account Payee Demand Draft/ Banker’s cheque
b) Fixed Deposit Receipt
c) **Bank Guarantee**

19.5. The demand draft or banker’s cheque shall be drawn on any commercial bank in India or country of the bidder, in favour of as indicated in the NIT payable at Bhubaneswar. In case of Bank Guarantee, the same is to be provided from any commercial bank in India or country of the bidder as per the format specified under Section XII in these documents.

19.6. The Bid Security shall be valid for a period of ninety (90) days beyond the validity period of the bid. As validity period of Bid as per Clause 20 of GIB is 365 days, the Bid Security shall be valid for 430 days from Technical Bid opening date.

19.7. The Bid Security of unsuccessful bidders will be returned without any interest, after expiry of the bid validity period, but not later than thirty days after conclusion of the resultant contract. The Bid Security of successful bidder will be returned without any interest, after receipt of performance security from that bidder.

19.8. Bid Security is required to protect the purchaser’s right against the risk of the Bidder’s conduct, which would warrant the forfeiture of the Bid Security. Bid Security of a bidder will be forfeited, if the bidder withdraws or amends its bids or impairs or derogates from the bid in any respect within the period of validity of its bid or if it comes to the notice that the information/documents furnished in its bid is incorrect, false, misleading or forged without prejudice to other rights of the purchaser. The Bid Security of the successful bidder will be forfeited without prejudice to other rights of Purchaser if it fails to furnish the required performance security within the specified period.

19.9. In the case of Bank Guarantee furnished from banks outside India (i.e. foreign Banks), it should be authenticated and countersigned by any nationalized bank in India by way of back-to-back counter guarantee and the same should be submitted along with the bid.

**20. Bid Validity**

20.1. If not mentioned otherwise in the SIB, the bid shall remain valid for acceptance for a period of 365 days (Three hundred sixty-five days) after the date of bid opening prescribed in the Tender Document. Any bid valid for a shorter period shall be treated as unresponsive and rejected.

20.2. In exceptional cases, the bidder may be requested by the purchaser to extend the validity of their bids up to a specified period. Such request(s) and responses thereto shall be conveyed by mail/fax/email. The bidders, who agree to extend the bid validity, are to extend the same without any change or modification of their original bid and they are also to extend the validity period of the Bid Security accordingly. A bidder, who may not agree to extend its bid validity after the expiry of the original validity period, their bid will not be considered further and the Bid Security furnished by them shall be returned.

20.3. In case the day up to which the bids are to remain valid falls on/ subsequently declared a holiday or closed day for the purchaser, the bid validity shall automatically be extended up to the next working day.

**21. PREPARATION OF BIDS**

21.1. Bidder should take into account any corrigendum published on the tender document before submitting their bids.

21.2. Please go through the tender advertisement and the Tender Document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.
21.3. Bidder, in advance, should get ready the documents to be submitted as indicated in the Tender Document. They need not wait up to the last date.

**D. SUBMISSION OF BIDS**

22. Instructions for Bid Submission
22.1. The bidders are required to submit hard copies along with soft copy (in a CD/DVD format) of their bids through India Post (Speed Post) to the Registrar, Utkal University, Vani Vihar, Bhubaneswar – 751 004, Odisha, India which should reach on or before the Bid Submission last date and time as mentioned in the “Critical Date Sheet”. Late received bids will not be considered in any case.
22.2. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard format with the tender document, then the same is to be downloaded and to be filled by all the bidders.

23. **ASSISTANCE TO BIDDERS**
23.1. Any queries relating to the Tender Document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the NIT.

**E. BID OPENING**

24. The Bids will open as per the date and time as mentioned in the “Critical Date Sheet”.

**F. SCRUTINY AND EVALUATION OF BIDS**

25. **Basic Principles**
25.1. Bids will be evaluated on the basis of the terms and conditions already incorporated in the Tender Document, based on which bids have been received and the terms, conditions etc. mentioned by the bidders in their bids. No new condition will be brought in while scrutinizing and evaluating the bids.

26. **Modification of Proposal**: The applicant is allowed to modify or withdraw its submitted proposal any time prior to the last date prescribed in the critical date sheet by giving a written notice to “Name of company”. Subsequent to the last date of receipt, no modifications of bids shall be allowed. The applicant cannot withdraw the proposal between the last date for receipt of proposal and the expiry of the proposal validity period. Such withdrawal may result in the forfeiture of its EMD from the applicant.

27. **Scrutiny of Bids**
26.1. The Purchaser will examine the Bids to determine whether they are complete, whether any computational errors have been made, whether required Bid Securities have been furnished, whether the documents have been properly signed stamped and whether the Bids are generally in order.
26.2. The Purchaser’s determination of a Bid’s responsiveness is to be based on the contents of the Bid itself without recourse to extrinsic evidence.
26.3. The Bids will be scrutinized to determine whether they are complete and meet the essential and important requirements, conditions etc. as prescribed in the Tender Document. The bids, which do not meet the basic requirements, are liable to be treated as non-responsive and will be rejected.
26.4. The following are some of the important aspects, for which a bid shall be declared non-responsive during the evaluation and will be ignored;
a) Tender Acceptance Form as per Section IX (signed and stamped).
b) Bid validity is shorter than the required period.
c) Required Bid Security (Amount, validity etc.)/ exemption documents have not been submitted as per stipulated provisions.
d) Bidder has quoted for goods manufactured by other manufacturer(s) without the required Manufacturer’s Authorization Form as per Section XIII.
e) Bidder has not agreed to give the required Performance Security of required amount in an acceptable form in terms of GCC clause 5, read with modification, if any, in Section V – “Special Conditions of Contract”, for due performance of the contract.
f) Bidder has not agreed to other essential condition(s) specially incorporated in the Tender document like terms of payment, liquidated damages clause, warranty clause, dispute resolution mechanism and applicable law.
g) Poor/unsatisfactory past performance.
h) Bidders who stand de-registered/banned/blacklisted by any Central Government Ministries/Departments/Hospitals/Institutes.
i) Bidder is not eligible as per Clauses 5, 6 & 17 of GIB.
j) Bidder has not quoted for the entire quantity of a particular item as specified in the List of Requirements in the quoted schedule.
k) Bidder has not agreed for the delivery terms and delivery schedule.

28. Minor Infirmity/Irregularity/Non-Conformity

27.1. If during the evaluation, the purchaser find any minor informality and/or irregularity and/or non-conformity in a bid, the purchaser will convey its observation on such ‘minor’ issues, which has not price implication, to the bidders by registered / speed post / e-mail / fax etc. asking the bidder to respond by a specified date. If the bidder does not reply by the specified date or gives evasive reply without clarifying the point at issue in clear terms, that bid will be liable to be ignored.

29. Qualification Criteria

28.1. Bids of the bidder, who have not submitted required documents or do not meet the required Qualification Criteria prescribed in Section VIII, will be treated as non-responsive and will not be considered further.

30. Conversion of bid currencies to Indian Rupees

29.1. In case the Tender Documents permits the bidder to quote their prices in different currencies, all such quoted prices of the responsive bidder will be converted to a single currency viz., Indian Rupees for the purpose of equitable comparison and evaluation, as per the exchange rates established by the Reserve Bank of India for similar transactions, as on the date of ‘Price Bid’ opening.

31. Schedule-wise Evaluation

30.1. In case the List of Requirements contains more than one schedule, the responsive bids will be evaluated and compared separately for each schedule. The bid for a schedule will not be considered if the complete requirements prescribed in that schedule are not included in the bid. However, as already mentioned in GIB sub clause 13.2, the bidder has the option to quote for any one or more schedules and offer discounts for combined schedules. Such discounts wherever applicable will be taken into account to determine the lowest evaluated cost for the purchaser in deciding the successful bidder for each schedule, subject to bidder (s) being responsive.
32. Comparison of Bids

31.1. Unless mentioned otherwise in Section III – Special Instructions to bidder and Section VI – List of Requirements, the comparison of the responsive Bids shall be carried out on Free Delivery at consignee site basis. The quoted Turnkey Work prices and CAMC prices will also be added for comparison/ranking purpose for evaluation. “Net Present Value (NPV) of the Comprehensive Annual Maintenance Contract Charges (CAMC) quoted for 5 years after the warranty period shall be added to the bid price for evaluation and will be calculated after discounting the quoted price by a discounting factor of 10% per annum.” However, the payment of CAMC shall be made to the successful bidder at approved rates.

33. Additional Factors and Parameters for Evaluation and Ranking of Responsive Bidders

32.1. Further to GIB Clause 36 above, the purchaser’s evaluation of a bid will include and take into account the following:

a) In the case of goods manufactured in India or goods of foreign origin already located in India, GST which will be contractually payable (to the bidder), on the goods if a contract is awarded on the bidder; and

b) In the case of goods of foreign origin offered from abroad, Custom Duty and GST which will be contractually payable (to the bidder) on the goods if the contract is awarded on the bidder.

32.2. The purchaser’s evaluation of bid will also take into account the additional factors, if any, incorporated in SIB in the manner and to the extent indicated therein.

32.3. The Purchaser reserves the right to give the price preference to small-scale sectors etc. and purchase preference to central public sector undertakings as per the instruction in vogue while evaluating, comparing and ranking the responsive Bids.

34. Bidder’s capability to perform the contract

33.1. The purchaser, through the above process of bid scrutiny and bid evaluation will determine to its satisfaction whether the bidder, whose bid has been determined as the lowest evaluated responsive bid is eligible, qualified and capable in all respects to perform the contract satisfactorily. If, there is more than one schedule in the List of Requirements, then, such determination will be made separately for each schedule.

33.2. The above-mentioned determination will, inter alia, take into account the bidder satisfying all the requirements of the purchaser as incorporated in the Tender Enquiry Document. Such determination will be based upon scrutiny and examination of all relevant data and details submitted by the bidder in its bid as well as such other allied information as deemed appropriate by the purchaser.

35. Contacting the Purchaser

34.1. From the time of submission of bid to the time of awarding the contract, if a bidder needs to contact the purchaser for any reason relating to NIT /Tender Enquiry Document and / or its bid, it should do so only through e-mail.

34.2. In case a bidder attempts to influence the purchaser in the purchaser’s decision on scrutiny, comparison and evaluation of bids and awarding the contract, the bid of the bidder shall be liable for rejection in addition to appropriate administrative actions being taken against that bidder, as deemed fit by the purchaser.

G. AWARD OF CONTRACT

36. Purchaser’s Right to accept any bid and to reject any or all bids.

35.1. 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).

37. Award Criteria
36.1. Subject to GIB clause 35 above, the contract will be awarded to the lowest evaluated responsive bidder decided by the purchaser in terms of GIB Clause 33.

38. Notification of Award
37.1. Before expiry of the bid validity period, the purchaser will notify the successful bidder(s) in writing, by registered / speed post or by fax/ email (to be confirmed by registered / speed post) that its bid for Goods and Services, which have been selected by the purchaser, has been accepted, also briefly indicating there in the essential details like description, specification and quantity of the goods and services and corresponding prices accepted. The successful bidder must furnish to the purchaser the required Performance Security within fifteen days from the date of dispatch of this notification, failing which the Bid Security will be forfeited and the award will be cancelled. Relevant details about the Performance Security have been provided in clause 5 of GCC under Section IV.
37.2. The Notification of Award shall constitute the conclusion of the Contract.

39. Issue of Contract
38.1. Promptly after notification of award, the Purchaser will mail the contract form (as per Section XV) duly completed and signed, in duplicate, to the successful bidder by registered / speed post.
38.2. Within twenty-one days from the date of the contract, the successful bidder shall return the original copy of the contract, duly signed and dated, to the Purchaser/ by registered / speed post/courier.
38.3. The Purchaser reserve the right to issue the Notification of Award consignee wise.

40. Non-receipt of Performance Security and Contract by the Purchaser
39.1. Failure of the successful bidder in providing Performance Security and / or returning contract copy duly signed in terms of GIB clauses 43 and 44 above shall make the bidder liable for forfeiture of its Bid Security and, also, for further actions by the Purchaser it as per the clause 24-Termination of default of GCC under Section IV.

41. Return of Bid Security/EMD
40.1. The Bid Security/EMD of the successful bidder and the unsuccessful bidder will be returned to them without any interest, whatsoever, in terms of Clause 19 of GIB.

H. CORRUPT OR FRAUDULENT PRACTICES

42. Corrupt or Fraudulent Practices
41.1. It is required by all concerned namely the Bidder /Suppliers/Purchaser/Consignee/End User etc. to observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the Purchaser:
a) defines, for the purposes of this provision, the terms set forth below as follows:
   (i) “corrupt practice” means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution; and
   (ii) “fraudulent practice” means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Purchaser, and includes collusive practice among bidders (prior to or after Bid
submission) designed to establish Bid prices at artificial non-competitive levels and to deprive the Purchaser of the benefits of free and open competition;
b) will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question;
c) will declare a firm ineligible, either indefinitely or for a stated period of time, to be awarded a contract by the purchaser if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing the contract.

SECTION III: SPECIAL INSTRUCTIONS TO BIDDERS (SIB)

The following Special Instructions to Bidders will apply for this purchase. These special instructions will modify/substitute/supplement the corresponding General Instructions to Bidders (GIB) incorporated in Section II. The corresponding GIB clause numbers have also been indicated in the text below:

In case of any conflict between the provision in the GIB and that in the SIB, the provision contained in the SIB shall prevail.

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SECTION IV: GENERAL CONDITIONS OF CONTRACT (GCC)

1. Application
   1.1. The General Conditions of Contract incorporated in this section shall be applicable for this purchase to the extent the same are not superseded by the Special Conditions of Contract prescribed under Section V, List of requirements under Section VI and Technical Specification under Section VII of this document.

2. Use of contract documents and information
   2.1. The supplier shall not, without the purchaser’s prior written consent, disclose the contract or any provision thereof including any specification, drawing, sample or any information furnished by or on behalf of the purchaser in connection therewith, to any person other than the person(s) employed by the supplier in the performance of the contract emanating from this Tender Document. Further, any such disclosure to any such employed person shall be made in confidence and only so far as necessary for the purposes of such performance for this contract.
   2.2. Further, the supplier shall not, without the purchaser’s prior written consent, make use of any document or information mentioned in GCC sub-clause 2.1 above except for the sole purpose of performing this contract.
   2.3. Except the contract issued to the supplier, each and every other document mentioned in
GCC sub-clause 2.1 above shall remain the property of the purchaser and, if advised by the purchaser, all copies of all such documents shall be returned to the purchaser on completion of the supplier’s performance and obligations under this contract.

3. Patent Rights
3.1. 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.

4. Country of Origin
4.1. 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.
4.2. The word “origin” incorporated in this clause means the place from where the goods are mined, cultivated, grown, manufactured, produced or processed or from where the services are arranged.
4.3. The country of origin may be specified in the Price Schedule.

5. Performance Security
5.1. Within fifteen (15) days from date of the issue of notification of award by the Purchaser, the supplier, shall furnish Performance Security to the Purchaser for an amount equal to ten percent (10%) of the total value of the contract, valid up to ninety (90) days after the date of completion of all contractual obligations by the supplier, including the warranty obligations.
5.2. The Performance security shall be denominated in Indian Rupees or in the currency of the contract as detailed below:
   It shall be in any one of the forms namely Account Payee Demand Draft or Fixed Deposit Receipt drawn from any Scheduled bank in India or Bank Guarantee issued by a Scheduled bank in India, in the prescribed form as provided in Section XIV of this document in favour of the Purchaser. The validity of the Fixed Deposit Receipt or Bank Guarantee will be for a period up to ninety (150) days beyond Warranty Period.
5.3. In the event of any failure /default of the supplier with or without any quantifiable loss to the government including furnishing of consignee wise Bank Guarantee for CAMC security as per Performa in Section XIV, the amount of the performance security is liable to be forfeited. The needful will be done to cover any failure/default of the supplier with or without any quantifiable loss to the Government.
   In the event of any amendment issued to the contract, the supplier shall, within fifteen (15) days of issue of the amendment, furnish the corresponding amendment to the Performance Security (as necessary), rendering the same valid in all respects in terms of the contract, as amended.
5.4. The supplier shall enter into Comprehensive Annual Maintenance Contract as per the „Contract Form – B in Section XV with respective consignees, 3 (three) months prior to the completion of Warranty Period. The CAMC will commence from the date of expiry of the Warranty Period.

Subject to GCC sub – clause 5.3 above, the Purchaser will release the Performance Security without any interest to the supplier on completion of the supplier’s all
contractual obligations including the warranty obligations & after receipt of Consignee wise bank guarantee for CAMC security in favour of concerned Comptroller of Finance, Utkal University as per the format in Section XIV.

6. Technical Specifications and General Points
6.1. The Goods & Services to be provided by the supplier under this contract shall conform Technical Specification under Sections VII of this document.

7. Packing and Marking
7.1. The packing for the goods to be provided by the supplier should be strong and durable enough to withstand, without limitation, the entire journey during transit including transhipment (if any), rough handling, open storage etc. without any damage, deterioration etc. As and if necessary, the size, weights and volumes of the packing cases shall also take into consideration, the remoteness of the final destination of the goods and availability or otherwise of transport and handling facilities at all points during transit up to final destination as per the contract.
7.2. The quality of packing, the manner of marking within and outside the packages and provision of accompanying documentation shall strictly comply with the requirements as provided in Technical Specifications under Sections VII and in SCC under Section V. In case the packing requirements are amended due to issue of any amendment to the contract, the same shall also be taken care of by the supplier accordingly.
7.3. Packing instructions:
   Unless otherwise mentioned in the Technical Specification under Sections VII and in SCC under Section V, the supplier shall make separate packages for each consignee (in case there is more than one consignee mentioned in the contract) and mark each package on three sides with the following with indelible paint of proper quality:
   a. Contract number and date
   b. Brief description of goods including quantity
   c. Packing list reference number
   d. Country of origin of goods
   e. Consignee’s name and full address and
   f. Supplier's name and address

8. Inspection, Testing and Quality Control
8.1. 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 will be to and fro Economy Airfare, Local Conveyance, Boarding and Lodging of the inspection team for the inspection period.”
8.2. 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.
8.3. 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.

8.4. 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.

8.5. 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.

8.6. 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’s inspector during pre-dispatch inspection mentioned above.

“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.”

8.7. 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 Clause 15.

8.8. 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.

9. Terms of Delivery
9.1. 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.

10. Transportation of Goods
10.1. 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.

11. Insurance
11.1. Unless otherwise instructed in the SCC, the supplier shall make arrangements for
insuring the goods against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery in the following manner:

i) In case of supply of domestic goods on Free Delivery at Consignee's Site basis, the supplier shall be responsible till the entire stores contracted for arrival in good condition at destination. The transit risk in this respect shall be covered by the Supplier by getting the stores duly insured for an amount equal to 110% of the value of the goods from warehouse to warehouse (consignee site) on all risk basis. The insurance cover shall be obtained by the Supplier and should be valid till three months after the receipt of goods by the Consignee.

ii) In case of supply of the imported goods on CIP (named port of Destination Basis), the additional extended Insurance (local transportation and storage) would be borne by the Supplier from the port of entry to the consignee site for a period including three months beyond date of delivery for an amount equal to 110% of the overall expenditure to be incurred by the purchaser from warehouse to warehouse (consignee site) on all risk basis.

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.

12. Spare parts
12.1. 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. 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:
      (i) 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
      (ii) 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.

12.2. 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.

13. Incidental Services
13.1. Subject to the stipulation, if any, in the SCC (Section V), List of Requirements (Section VI) and the Technical Specification (Section VII), 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 Doctors, Staff, operators etc. for operating and maintaining the goods.
iv) Supplying required number of operation & maintenance manual for the goods.

14.1. 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. Unless otherwise specified in the SCC, the usual documents involved and the drill to be followed in general for this purpose are as follows:

Within 24 hours of dispatch, the supplier shall notify the concerned Officer of 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 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.

15. Warranty and CAMC
15.1. 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.

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

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

15.4. Warranty as well as Comprehensive Annual Maintenance Contract 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

15.5. 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. The period of the warranty will be as per G.C.C clause number 15.2 unless revised in SCC in Section V of Tender Document.

15.6. 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.

15.7. 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.

15.8. 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.

15.9. 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.

15.10. The Purchaser/Consignee reserve the rights to enter into Comprehensive Annual Maintenance Contract between the Purchaser and the Supplier for the period as mentioned in Section VII, Technical Specifications after the completion of warranty period.

15.11. 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.

15.12. The Supplier along with its Manufacturer Indian Agent and the CMC 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.

16. Assignment

16.1. The Supplier shall not assign, either in whole or in part, its contractual duties, responsibilities and obligations to perform the contract, except with the Purchaser’s prior written permission.

17. Subcontracts

17.1. The Supplier shall notify the Purchaser in writing of all sub contracts awarded under the contract, if not already specified in its bid. Such notification, in its original bid or later, shall not relieve the Supplier from any of its liability or obligation under the terms and conditions of the contract.

17.2. Sub contract shall be only for bought out items and sub-assemblies.

17.3. Sub contracts shall also comply with the provisions of GCC Clause 4 (“Country of Origin”).

18. Modification of Contract

18.1. If necessary, the purchaser may, by a written order given to the supplier at any time during the currency of the contract, amend the contract by making alterations and modifications within the general scope of contract in any one or more of the following:

a) Specifications, drawings, designs etc. where goods to be supplied under the contract is to be specially manufactured for the purchaser,

b) Mode of packing,

c) Incidental services to be provided by the supplier

d) Mode of dispatch,
e) Place of delivery, and
f) Any other area(s) of the contract, as felt necessary by the purchaser depending on the merits of the case.

18.2. In the event of any such modification/alteration causing increase or decrease in the cost of goods and services to be supplied and provided, or in the time required by the supplier to perform any obligation under the contract, an equitable adjustment shall be made in the contract price and/or contract delivery schedule, as the case may be, and the contract amended accordingly. If the supplier doesn’t agree to the adjustment made by the Purchaser the supplier shall convey its views to the Purchaser within twenty-one days from the date of the supplier’s receipt of the Purchaser’s amendment/modification of the contract.

19. Prices
19.1. Prices to be charged by the supplier for supply of goods and provision of services in terms of the contract shall not vary from the corresponding prices quoted by the supplier in its bid and incorporated in the contract except for any price adjustment authorized in the SCC.

20. Taxes and Duties
20.1. Supplier shall be entirely responsible for GST incurred until delivery of the contracted goods to the purchaser.

Further instruction, if any, shall be as provided in the SCC.

21. Terms and Mode of Payment
21.1 Payment Terms

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 shall be made in Indian Rupees as specified in the contract in the following manner:

a) On delivery: Seventy-five (75) per cent payment of the contract price shall be paid on receipt of goods in good condition and upon the submission of the following documents;
   (i) original copies of supplier’s invoice showing contract number, goods description, quantity, packing list, unit price and total amount;
   (ii) Consignee Receipt Certificate as per Section XVII of Tender document in original
b) On Acceptance: Balance twenty-five (25) per cent 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 trial 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) On Shipment: Seventy-Five (75) per cent of the net FCA/CIP price (i.e. FCA/CIP price less Indian Agency commission) of the goods despatch 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 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.

c) **On Acceptance:** Balance payment of twenty-five (25) per cent of net FCA/CIP price of goods would be made against “Installation and Acceptance Certificate” to be issued by the End User through irrevocable, non-transferable Letter of Credit (LC) opened in favour of the Foreign Principal in a bank in his country, subject to recoveries, if any. “Installation and Acceptance Certificate” need to be issued by the concerned End User after installation, commissioning, testing and successful trial run (if applicable).

d) Payment of Consumable Imported Goods/Reagents/Kits would be made hundred (100) per cent against “Installation and Acceptance Certificate” to be issued by the End User through Wire Transfer.

e) **Payment of Incidental Costs:** Incidental costs till consignee site towards Incidental Services (including Installation and Commissioning, Supervision, Demonstration and Training), if applicable will be paid in Indian Rupees to the Indian Agent on submission of “Installation and Acceptance Certificate” by the End-user.

f) **Payment of Indian Agency Commission:** Indian Agency Commission (IAC) will be paid to the Authorized Manufacturer's agent in Indian Rupees indicated in the contract (as per prevailing rate of exchange ruling on the date of Contract) and shall not be subject to further escalation / exchange variation. The agency commission payment shall be made on submission of “Installation and Acceptance Certificate” by the End-user.

C. **Payment of Turnkey Work (Civil/Electrical/Air-Conditioning Works) at site:** The payment related to Civil/Electrical/Air-Conditioning Works at site will be made as indicated in the contract (as per prevailing rate of exchange ruling on the date of Contract) and shall not be subject to further escalation / exchange variation. The payment for Civil/Electrical/Air-Conditioning works shall be made on submission of “Installation and Acceptance Certificate” by the End-user.

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.

21.2. 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 authorised 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.

22. Delivery

22.1. The supplier shall deliver the goods and perform the services under the contract within the time schedule specified by the Purchaser in the List of Requirements and as incorporated in the contract. The time for and the 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.

22.2. Subject to the provision under GCC clause 26, any unexcused delay by the supplier in maintaining its contractual obligations towards delivery of goods and performance of services shall render the supplier liable to any or all of the following sanctions:

   (i) Imposition of liquidated damages,
   (ii) Forfeiture of its Performance Security and
   (iii) Termination of the Contract for default.

22.3. If at any time during the currency of the contract, the supplier encounters conditions hindering timely delivery of the goods and performance of services, the supplier shall promptly inform the Purchaser in writing about the same and its likely duration and make a request to the Purchaser for extension of the delivery schedule accordingly. On receiving the supplier's communication, the Purchaser shall examine the situation as soon as possible and, at its discretion, may agree to extend the delivery schedule, with or without liquidated damages for completion of supplier's contractual obligations by issuing an amendment to the contract.

22.4. When the period of delivery is extended due to unexcused delay by the supplier, the amendment letter extending the delivery period shall, inter alia contain the following conditions:

   (a) The Purchaser shall recover from the supplier, under the provisions of the clause 23 of the General Conditions of Contract, Liquidated Damages on the goods and services, which the Supplier has failed to deliver within the delivery period stipulated in the contract.
   (b) That no increase in price on account of any ground, whatsoever, including any stipulation in the contract for increase in price on any other ground and, also including statutory increase in or fresh imposition of GST levied in respect of the goods and services specified in the contract, which takes place after the date of delivery stipulated in the contract shall be admissible on such of the said goods and services as are delivered and performed after the date of the delivery.
stipulated in the contract.

(c) But nevertheless, the Purchaser shall be entitled to the benefit of any decrease in price on account of reduction in or remission of Custom Duty and GST which takes place after the expiry of the date of delivery stipulated in the contract.

22.5. 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.

22.6. **Passing of Property**

a) The property in the goods shall not pass to the purchaser unless and until the goods have been delivered to the consignee in accordance with the contract.

b) Where there is a contract for sale of specific goods and the supplier is bound to do something to the goods for the purpose of putting them into a deliverable state the property does not pass until such thing is done.

c) Unless otherwise agreed, the goods remain at the supplier’s risk until the property therein is transferred to the purchaser.

23. **Liquidated Damages**

23.1. Subject to GCC clause 26, if the supplier fails to deliver or install/commission any or all of the goods or fails to perform the services within the time frame(s) incorporated in the contract, the Purchaser shall, without prejudice to other rights and remedies available to the Purchaser under the contract, deduct from the contract price, as liquidated damages, a sum equivalent to 0.5% per week of delay or part thereof on delayed supply of goods, installation, commissioning and/or services until actual delivery or performance subject to a maximum of 10% of the contract price. Once the maximum is reached Purchaser may consider termination of the contract as per GCC 24.

During the above-mentioned delayed period of supply and/or performance, the conditions incorporated under GCC sub-clause 22.4 above shall also apply.

24. **Termination for Default**

24.1. The Purchaser without prejudice to any other contractual rights and remedies available to it the Purchaser, may, by written notice of default sent to the supplier, terminate the contract in whole or in part, if the supplier fails to deliver any or all of the goods or fails to perform any other contractual obligation(s) within the time period specified in the contract, or within any extension thereof granted by the Purchaser pursuant to GCC sub-clauses 22.3 and 22.4.

24.2. The Performance Security in such cases will be forfeited.

24.3. Unless otherwise instructed by the Purchaser, the supplier shall continue to perform the contract to the extent not terminated.

25. **Termination for Insolvency**

25.1. If the supplier becomes bankrupt or otherwise insolvent, the purchaser reserves the right to terminate the contract at any time, by serving written notice period of 30 days to the supplier without any compensation, whatsoever, to the supplier, subject to further condition that such termination will not prejudice or affect the rights and remedies which have accrued and / or will accrue thereafter to the Purchaser.

26. **Force Majeure**

26.1. Notwithstanding the provisions contained in GCC clauses 22, 23 and 24, the supplier
shall not be liable for imposition of any such sanction so long the delay and/or failure of the supplier in fulfilling its obligations under the contract is the result of an event of Force Majeur.

26.2. For purposes of this clause, Force Majeur means an event beyond the control of the supplier and not involving the supplier’s fault or negligence and which is not foreseeable and not brought about at the instance of the party claiming to be affected by such event and which has caused the non-performance or delay in performance. Such events may include, but are not restricted to, wars or revolutions, hostility, acts of public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restrictions, strikes excluding by its employees, lockouts excluding by its management and freight embargoes.

26.3. If a Force Majeur situation arises, the supplier shall promptly notify the Purchaser in writing of such conditions and the cause thereof within twenty-one (21) days of occurrence of such event. Unless otherwise directed by the Purchaser in writing, the supplier shall continue to perform its obligations under the contract as far as reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeur event.

26.4. If the performance in whole or in part or any obligation under this contract is prevented or delayed by any reason of Force Majeur for a period exceeding sixty days, either party may at its option terminate the contract without any financial repercussion on either side.

26.5. In case due to a Force Majeur event the Purchaser is unable to fulfil its contractual commitment and responsibility, the Purchaser will notify the supplier accordingly and subsequent actions taken on similar lines described in above sub-paragraphs.

27. Termination for Convenience

27.1. The Purchaser reserves the right to terminate the contract, in whole or in part for its Purchaser’s convenience, by serving written notice on the supplier at any time during the currency of the contract. The notice shall specify that the termination is for the convenience of the Purchaser. The notice shall also indicate inter alia, the extent to which the supplier’s performance under the contract is terminated, and the date with effect from which such termination will become effective.

27.2. The goods and services which are complete and ready in terms of the contract for delivery and performance within thirty days after the supplier’s receipt of the notice of termination shall be accepted by the purchaser following the contract terms, conditions and prices. For the remaining goods and services, the Purchaser may decide:

a) To get any portion of the balance completed and delivered at the contract terms, conditions and prices; and/or

b) To cancel the remaining portion of the goods and services and compensate the supplier by paying an agreed amount for the cost incurred by the supplier towards the remaining portion of the goods and services.

28. Governing Language

28.1. The contract shall be written in English language following the provision as contained in GIB clause 4. All correspondence and other documents pertaining to the contract, which the parties exchange, shall also be written accordingly in that language.

29. Notices

29.1. Notice, if any, relating to the contract given by one party to the other, shall be sent in writing or by Facsimile/email and confirmed in writing. The procedure will also provide the sender of the notice, the proof of receipt of the notice by the receiver. The addresses of the parties for exchanging such notices will be the addresses as incorporated in the contract.
29.2. The effective date of a notice shall be either the date when delivered to the recipient or the effective date specifically mentioned in the notice, whichever is later.

30. Resolution of Disputes
30.1. If dispute or difference of any kind shall arise between the Purchaser/Consignee and the supplier in connection with or relating to the contract, the parties shall make every effort to resolve the same amicably by mutual consultations.
30.2. If the parties fail to resolve their dispute or difference by such mutual consultation within twenty-one days of its occurrence, then, unless otherwise provided in the SCC, either the Purchaser/Consignee or the supplier may give notice to the other party of its intention to commence arbitration, as hereinafter provided the applicable arbitration procedure will be as per the Arbitration and Conciliation Act, 1996 of India.
30.3. In the case of a dispute or difference arising between the Purchaser and a domestic Supplier relating to any matter arising out of or connected with the contract, such dispute or difference shall be referred to the sole arbitration to be appointed by the Vice-Chancellor, Utkal University. The award of the arbitrator shall be final and binding on the parties to the contract subject to the provision that the Arbitrator shall give reasoned award in case the value of claim in reference exceeds `1,00,000(Rupees One lakhs).
30.4. Venue of Arbitration: The venue of arbitration shall be the place from where the contract has been issued, i.e., Bhubaneswar / Cuttack, India.
30.5. Jurisdiction of the court will be from the place where the Tender Document has been issued, i.e., Bhubaneswar, India

31. Applicable Law
31.1. The contract shall be governed by and interpreted in accordance with the laws of India for the time being in force.

32. Withholding and Lien in respect of sums claimed
32.1. Whenever any claim for payment arises under the contract against the supplier the purchaser shall be entitled to withhold and also have a lien to retain such sum from the security deposit or sum of money arising out of under any other contract made by the supplier with the purchaser, pending finalization or adjudication of any such claim.
32.2. It is an agreed term of the contract that the sum of money so withheld or retained under the lien referred to above, by the purchaser, will be kept withheld or retained till the claim arising about of or under the contract is determined by the Arbitrator or by the competent court as the case may be and the supplier will have no claim for interest or damages whatsoever on any account in respect of such withholding or retention.

33. Negotiations Clause
33.1. 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).

34. Fall Clause
34.1. Fall clause is a price safety mechanism. The fall clause provides that if the contract holder reduces its price or sells or even offers to sell the contracted goods of identical specification and terms and conditions to that of the contract, at a price lower than the contract price, to any person or organization during the currency of the Contract, the Contract price will be automatically reduced with effect from that date for all the subsequent supplies under the Contract and the contract amended accordingly.
SECTION V: SPECIAL CONDITIONS OF CONTRACT (SCC)

1. The following Special Conditions of Contract (SCC) will apply for this purchase. The corresponding clauses of General Conditions of Contract (GCC) relating to the SCC stipulations have also been incorporated below.
2. These Special Conditions will modify/substitute/supplement the corresponding (GCC) clauses.
3. Whenever there is any conflict between the provision in the GCC and that in the SCC, the provision contained in the SCC shall prevail.
4. **The warranty conditions will be as mentioned in the list of requirements as per section VII of the Tender Document.**

SECTION VI: LIST OF REQUIREMENTS

Part I

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Name of the Equipment</th>
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<tbody>
<tr>
<td>1</td>
<td>Field emission scanning electron microscope</td>
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<tr>
<td>2</td>
<td>Fourier transformed infrared (FTIR) Spectrometer with ATR</td>
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<tr>
<td>3</td>
<td>Liquied chromatography mass spectrophotometer (LC-MS/MS)</td>
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<td>4</td>
<td>GC-MS</td>
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<td>5</td>
<td>Confocal microscope with live cell imaging</td>
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<td>6</td>
<td>Flow cytometer cum analyzer</td>
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<td>HPTLC</td>
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<td>10</td>
<td>Automated protein purification system</td>
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<td>Inductive coupled plasma (ICP)-OES analyzer</td>
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<td>15</td>
<td>Biosafety cabinet class II</td>
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<td>Inverted Microscope</td>
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<td>Ultracentrifuge</td>
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<td>Deep freezer (-20°C)</td>
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<td>Deep freezer (-80°C)</td>
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<td>Freezer (4°C)</td>
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<td>28</td>
<td>BOD Incubator</td>
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<td>29</td>
<td>UV-Vis spectrophotometer</td>
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<td>Description</td>
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<td>30</td>
<td>UV-Vis spectrophotometer with Microvolume Capacity</td>
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<td>UV-Vis spectrophotometer with DRS</td>
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<td>Electrophoresis system with semi dry blotting/transfer unit</td>
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<td>Trans Blot Turbo Transfer System</td>
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Part II: Required Delivery Schedule:

A. For Indigenous goods or for imported goods if supplied from India:
60 days from date of Notification of Award to delivery at consignee site. The date of delivery will be the date by when it is to be delivered at consignee site. Bidders may quote earliest delivery period.
Installation and Commissioning shall be done at the earliest but not later than 20 days of delivery of goods at site or date of handing over the site for installation, whichever is later?

B. For Imported goods directly from foreign:
120 days from the date of opening of L/C. The date of delivery will be the date of Bill of Lading/Airway bill. (Bidders may quote the earliest delivery period).

Installation and Commissioning shall be done at the earliest but not later than 45 days of delivery of goods at site or date of handing over the site for installation, whichever is later?
For delayed delivery and/or installation and commissioning liquidated damages will get applied as per GCC clause 23.

**Part III: Scope of Incidental Services:**
Installation and Commissioning, Supervision, Demonstration, Trial run and Training etc. as specified in GCC Clause 13.

**Part IV:** Turnkey Work (if any) as per details in Technical Specification.

**Part V:** Warranty period as per details mentioned in technical specification and as specified in Part I above. Warranty period will start from the date of installation, commissioning and acceptance.

Comprehensive Annual Maintenance Contract (CAMC) as per details in Technical Specification as specified in part I above. Comprehensive Annual Maintenance Contract (CAMC) will start from the date of successful completion of warranty period.

**Required Terms of Delivery and Destination.**

a) **For Indigenous goods or for imported goods if supplied from India:**
   Free Delivery at Consignee’s Site(s)

b) **For Imported goods directly from abroad:**
The foreign bidders are required to quote their rates on CIP (Named Port of Destination Basis) giving breakup of the price as per the Proforma prescribed in the Price Schedule. Purchaser will place the order on CIP (Named Port of Destination basis). Insurance (Local Transportation and Storage) would be extended and borne by the Supplier from ware house to the consignee site for a period including 3 months beyond date of delivery.

**SECTION VII: DETAILED TECHNICAL SPECIFICATION**

**Item Code: 1**
**FESEM (Field Emission Scanning Electron Microscope) with EDS**

**Essential Specifications:**
FESEM instrument must be the state of art, computer-controlled user-friendly system for high resolution imaging of metallic, non-metallic, magnetic and nonmagnetic, ceramics, crystals, thin films, polymers, metal oxides, biological samples etc. of micro to nano-scale dimensions, which will be either coated/uncoated while imaging. The FESEM should have EDS capability. The FESEM with integrated EDS must have the following technical specification:

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<th>Specification</th>
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<td>Resolution</td>
<td>1.0 nm or better at 1KV and 0.9 nm or better @15 KV</td>
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<tr>
<td>Magnification</td>
<td>X25 to X 10, 00, 000</td>
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<tr>
<td>Acceleration Voltage</td>
<td>Continuously adjustable from 100 V to 30 kV or higher. All the kV settings must be software controlled</td>
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<td>Chamber</td>
<td>Large chamber with at least 10 accessory ports. Anti-vibration table must be inbuilt</td>
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<tr>
<td>Stage</td>
<td>5 axes motorized fully eccentric stage with motorized stage movements equivalent to or better to X ≥ 70 mm</td>
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<td><strong>Probe Current</strong></td>
<td>At least 1 pA up to 200 nA or higher. (Stability better than 0.2% per hour) Several beam defining aperture is preferable.</td>
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</table>
| **Detectors**    | a) High sensitive Everhart-Thornley SED detector  
                 b) In-Lens SEI detector for high resolution imaging in High Vacuum at low kV.  
                 c) IRCCD camera  
                 d) High resolution state of art back scattered detector (BSD) |
| **User Interface** | Keyboard, Mouse, Control Panel with multifunction for the control and adjustment of frequently used SEM parameters, Manual Joystick control for stage axis. |
| **Electron Optics** | Beam deceleration/ Beam booster technology/ Gentle beam technology or equivalent for high resolution imaging at low kV.  
                               The system must have magnetic/electrostatic objective/ super hybrid lens or equivalent lens assembly for high resolution imaging of magnetic materials with shorter working distance.  
                               The lenses must be water cooled in nature; apparatus must be motorized. Single condenser lens with cross-over free beam path is preferable  
                               Desired features:  
                               FESEM should have energy filter Secondary and Back scattered electron signals  
                               Guarantee for stability of probe current (Stability better than 0.2% per hour)  
                               Full screen of live image should be possible  
                               Four simultaneous live images should be possible  
                               FESEM should have a recipe feature  
                               FESEM should have a provision of liquid nitrogen trap/ anti-contamination facility to prevent contamination  
                               Ease of operation is desired. |
| **Working Distance** | 4 mm or less to 40 mm or more (continuous preferable)  
                        Automatic compensation for acceleration voltage and working distance is preferable. |
| **Vacuum System** | a. Vacuum system having ion pump/Oil free Pump. Suitable fully automatic PC controlled vacuum system equipped with ion pumps, turbo-molecular pump & rotary pump.  
                        b. Chamber pressure better than \(10^{-6}\) Pa / \(4 \times 10^{-6}\) mbar  
                        c. Should have pumping Time < 5 minutes after Specimen Exchange.  
                        d. Computer controlled automated differential vacuum/ monitoring system  
                        e. Automatically operated pneumatic column isolation valve. |
| **Digital imaging and processing** | It should have the following capabilities:  
                                    a. Design of the imaging and processing should be optimized for field emission scanning electron microscopy |
| Image Display | a. Two 32” LED Monitors with two work stations: one for control of FESEM. One for control another for Imaging. Image frame store rate must be 6k x 5k or better.  
 b. Standard data zone includes magnification, working distance, EHT, scale bar and date Custom data zone  
 c. Multiple point-to-point and line width measurement systems freely adjustable for orientation  
 d. Line profile display  
 e. Images can be viewed live, averaged or integrated  
 f. One separate offline work station for data analysis |
|-----------------------------------------------|
| Image Storage | a. 2 TB hard disk or better  
 b. Front panel USB ports. CD/DVD recorder  
 c. Storage of SEM images on hard disk in standard TIFF, BMP, or JPEG Formats and in 8-bit or 16-bit depth  
 d. Operating conditions easily stored and file management through Microsoft® Windows operating system |
| Essential Accessories | **A. High vacuum sputter coater with Double Head Design**  
  - Minimum vacuum: 2x10^-6 mbar achieved with oil-free, 4 stage diaphragm pump and turbomolecular drag pump  
  - 3 axis (rotation, height, tilt) motorized stage with touch screen interface  
  - Angled at 25° Double head design for dual sputter coating processes without breaking the vacuum.  
  - Stage tilt 0 to ± 60°  
  - Flat specimen table of diameter 104mm  
  - Fully automated sputtering process with automated target cleaning and automated shutter.  
  - Automatic regulation of process parameters such as vacuum and argon rinses.  
  - One touch operation via integrated intuitive touch screen interface.  
  - Programmable sputter recipes.  
  - Automatic execution of saved recipes  
  - Front loading chamber with removable hinged door and inner shield for easy and fast cleaning.  
  - Sputter head with bayonet target clamp  
  - Real time thickness measurement  
  - Integrated quartz crystal measurement (QSG) with the resolution of 0.1nm  
  - Integrated LED light. |
- Planetary rotary stage for even distribution of coating on fissured samples
- Log file storage and export via USB.
- Easy software update via USB.
- Multiple software and hardware safety interlocks.

B. **Critical Point dryer for SEM sample preparation**

Fully automated instrument for reproducible results
- Stainless steel pressure chamber (Ø 60mm x 62mm) with chamber lock detection
- Corrosion resistant Burst Membrane
- Integrated, easily removable waste separator
- Front and top sight-glass with LED illumination
- Magnetic coupled stirrer
- Software controlled temperature and pressure cut off function
- Touch screen user interface with store and recall drying processes
- Sample Transfer Basket with basket rest
- Filler system to decrease CO₂ usage
- Varying speeds for CO₂ inlet (slow medium fast) depending on sample type
- Different heating range (1°C/min, 2°C/min and 3°C/min) depending on sample type
- Different holders for varying sample size
  - Cover slip holder: 12mm, 18mm and 22mm diameter, Filter discs and porous pots holder
  - Grid holder, 2-inch wafer holder and Arthropoda holder & Fine mesh specimen holder

C. **Automatic Tissue Processor:**
The instrument should include the following points:

- with wide range power supply for 100 - 240 VAC, 50-60Hz.
- Fume exhaust system
- Hose for exhaust 3m long
- Stainless steel internal surface
- Turntable for 24 EM vials or 12 EM vials
- Liquid impermeable keyboard with LCD display
- Memory for 99 programmes: each step from 00h 00min - 99h59min
- Delay start. Specimen agitation adjustable from 0-5Hz
- Pre-set and programmable reagent list of 200 reagents. Reagent list should include: Buffer, osmium, OsO₄, ethanol, resin, methanol
- Back up battery for power failure
- software should include graphic user interface for: adding reagent names, creating programmes and printing of protocols.

D. Chiller [best quality with no vibration and noise issue]
E. Compressor.
F. Interface among FESEM and EDS
G. Suitable objective for magnetic sample study [Field-free immersion lens]

Software packages
- Particle size analysis and image processing software
- AVI capture facility
- Windows based software and multiple offline licenses for analysis.
- The latest version of software for the quoted model should be included.
- For off-line analysis suitable interfacing, if required, should be provided for another computer for further analysis.
- Data formats (continuous ACSII, TIFF, JPEG, BMP, etc.) Backup software must be provided on optical media.
- Any further version of the software and updates must be provided free of cost.

| Calibration Standards for calibration of magnifications, dimensional and resolution must be supplied. |
|---|---|
| Integrated EDS | **EDS**

  a) Liquid Nitrogen Free, Peltier cooled high-resolution high-speed silicon drift detector with 30mm² crystal area, Solid angle > 0.4 Sr and 130 eV resolution or better at MnKα and carbon resolution 50eV in compliance with ISO 15632:2012 specifications.

  The elements detection range should be from Boron (B) to Uranium (U) and detector can process at greater than 1 Mcps input and greater than 800cps output

  b) The EDS should be capable of selective element mapping, line scan, selected area analysis, quantitative analysis, qualitative analysis (continuous with ZAF correction), and real time phase mapping

  c) The provided EDS system should have the capability to be upgraded to WDS for future research requirements.

  d) Supplied EDS server & analysis software should be capable of performing data acquisition, storing and transfer in common Windows based application format, qualitative & quantitative analysis, line scanning, elemental or dot-mapping (area) including spectrum imaging and phase mapping with specimen drift correction.

  e) All these capabilities should be applicable for polished flat specimens, fractured samples and nanostructured particulate systems.

  f) User interactive qualitative and standard less/ standards-based quantification with K, L, M, N line database. Real time elemental mapping with auto elemental identification, quantification based on ZAF, PhiZAF. Should have quantification algorithm for uneven surfaces and under tilted conditions

  g) Pile up correction and background noise reduction, simultaneous imaging and analysis should be possible.

  h) Thin film analysis software with nanometer scale resolution in both space and depth capabilities should be quoted.

Calibration standard (Preferably from National Institute of Standards and Technology (NIST)) –

  a. 1 No’s with 36 element standard materials suitable for use with EDS systems. The materials should be mounted on a 1” or 1.25” diameter stub with a Faraday cup for Beam Current measurements.

  b. The elements are those commonly required for metals, alloys, nitrides, oxides etc.

  c. Complete set of user manuals should be provided for the EDS system.

Future Upgradability The specimen chamber should be large and compatible to accommodate other detectors such as WDS, CLD and e-beam lithography system for
future requirements (all these must be field installable) without any additional interfacing accessories. Additionally, the system should preferably upgradable to a dual beam focus-ion beam /Gas Injection system.

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<th>Power Backup</th>
<th>Dedicated back-up power supply for FESEM full load power for at least 24 hr continuously in case of power failure</th>
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| Warranty, Training and Support | • Five years comprehensive warranty (not including the down time) must be included along with the bid/offer separately.  
  • Warranty should start from date of commissioning.  
  • Service response time, turn-around time & up-time of the equipment should be clearly specified.  
  • Necessary on-site training must be provided.  
  • Service response time must be 48 hours.  
  • The FESEM must have provision for on-line diagnosis of faults.  
  • Provision for dedicated man power for running the system for 5-yr and doing routine sample analysis must be included separately.  
  • The operator should be not only trained in operating but also know the installation requirements for smooth uninterrupted functioning of the FESEM |
| Environmental requirements | Necessary environmental requirements, i.e., temperature, humidity etc. during the operation of FESEM/EDS system should be specified clearly |
| Compliance Statement | a. The supplier must submit technical brochures and proper application notes adequately explaining and confirming the availability of the features in the model of the equipment being quoted.  
  b. Features not matching must be clearly indicated. |

**Item Code: 2**

**FT-IR SPECTROMETER (FT-IR) WITH ATR**

**Specifications:**
- 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: 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.
- Dehumidifier to be quoted if required
- On line 1 kVA branded UPS with at least 30 min power back up
• Branded Desktop Computer (Intel core i5 or better processor, DVD Writer) and Laser printer

**Warranty:**
• Minimum 05 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.
  Suitable online UPS with 20 minutes back-up to run the instrument and computer

**Item Code: 3**

**LC-MS MS (HRMS) (Liquid chromatography spectrometer)**

A complete HRMS workstation capable to analyse differential expression of protein (targeted/untargeted proteomic/ identification of protein), PTM, Metabolomics, Lipidomic sand small molecule/ synthetic molecular characterization. The work station should have ESI, APCI, Nano ESI, software with following minimum specifications. There should be number of installations of HR MS quoted in reputed proteomics research lab in India.

<table>
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<th>Descriptions</th>
<th>Required Technical Specifications</th>
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<tr>
<td>Mass Analyzer</td>
<td>The HRMS should be hybrid analyser, Quadrupole with TOF or FTMS or orbitrap with collision cell for MS/MS</td>
</tr>
</tbody>
</table>
| 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°C  
B. APCI probe compatible with flow rate from 50ul/min to 2ml/min with desolation temperature up to 500°C  
C. Nano ESI source compatible with flow rate from 50nl/ml to 2000nl/ml without flow splitting.  
D. Direct infusion Syringe with syringe pump and divert valve for calibration and direct infusion of sample.  
E. Suitable accessory for sample introduction by direct infusion in the system must be supplied.  

Ion Sources: The instrument should have at least ESI/APCI, APCI/APPI, NANO ESI ion sources (ASAP is included as optional). 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.  
- It should also be capable of performing ETD or similar technology for PTM analysis.  

<table>
<thead>
<tr>
<th>Quadrupole Mass Range</th>
<th>50m/z to 2000m/z or better</th>
</tr>
</thead>
</table>
| Mass Resolution       | Quadruple Mass range: 50-2000 Da or better  
Minimum resolution at m/z 200 (approximately) should be greater than 35,000 FWHM or better for QTOF and 2, 00, 000 FWHM or better for Orbitrap. |
<table>
<thead>
<tr>
<th><strong>Mass Accuracy</strong></th>
<th>Wit internal calibration &lt;1ppm and external calibration &lt;3ppm. The external calibration should hold for at least 24 hr.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sensitivity</strong></td>
<td>1 pg of reference standard reserpine /buspirone in full scan mode should produce S/N&gt;200:1</td>
</tr>
<tr>
<td><strong>Acquisition speed</strong></td>
<td>Acquisition speed: High speed, with very high response time, and efficient fragmentation is expected. For MS/MS acquisitions: ≥ 100 Hz for QTOF, and ≥ 12 Hz for Orbitrap @ 15, 000 resolutions at 200 m/z is expected.</td>
</tr>
<tr>
<td><strong>Scan Functions</strong></td>
<td>Full Scan, SIM Scan, Data dependent MS$n$, DIA /SWATH with variable quadrupole isolation window from 10Da to 100Da or better. Parallel reaction monitoring etc.</td>
</tr>
<tr>
<td><strong>Dynamic Range</strong></td>
<td>The system should have in-spectrum dynamic range of 5000:1 or 4 order of linear dynamic range</td>
</tr>
</tbody>
</table>
| **2D 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 (Splitless) System should offer reproducible gradient down to 100nl/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 +5 Deg C to 40 Deg C (+1 Deg C)] with integrated 10-port valves.  
• Programmable injection with auto-sampler (from 100 nl to 10 µl with standard 10 µl 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 detector.  
• 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, C4 columns with guard/trap columns for all. It should also come with mass spec grade required reagents and solvents. |
| **Fast and High-Resolution LC System (For discovery phase and validation phase)** | • Quaternary/ binary gradient system with Vacuum Degasser, Auto sampler and Column Oven for Ultrafast separations.  
• Flow accuracy of +/- 1.0% (0.500-2.00 mL/min) 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 and should be capable of accommodating 96 well plate with injection volume ranging from 0.5 – 50 µL, 0.1 µL increments, partial or full loop mode.  
• The system should have sample temperature control from 4 – 40 Deg C programmable in 1 Deg C increments (ambient temp: 20 Deg 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.
- PDA detector, 190-700 nm. Wavelength accuracy ± 1 nm.
- 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, and HILIC columns with guard/trap columns for all. It should also come with mass spec grade required reagents and solvents.

### 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 the mass spectrometers a minimum of 4 work stations (LCD of minimum 27 inch) should be provided, one for controlling the mass spectrometer, the LC and auto-sampler the others for data analysis and storage. Latest version of MASCOT search engine for database analysis. 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, de novo sequencing, data base search and biomarker studies. Single Software package should be able to compile data from all the mass analysers and group the overlapping results to present a comprehensive report of all identified analytes without need to change the file format.

Complete advanced software for proteomics, Lipidomics and metabolomics analysis, database searches, quantification, validation as 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 and metabolomics integrated software to understand the biological context of identified proteins and metabolites including pathways.

### Nitrogen Generator

A suitable imported Nitrogen Generator with inbuilt compressor with flow rate of 30 Lit/min with minimum pressure of 110 psi.

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.
Helium Cylinders 2 Nos
Helium Regulators (S.S.) 2 Nos
Moisture / hydrocarbon trap 1 Nos must be supplied

<table>
<thead>
<tr>
<th>UPS</th>
<th>15 KVA UPS with 1 hr Battery back and isolation transformation in built.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gases</td>
<td>If any additional gases required should be quoted with regulator</td>
</tr>
<tr>
<td>References</td>
<td>Should provide at least 4 references from reputed institutes where it is being used for proteomics application.</td>
</tr>
<tr>
<td>Warranty</td>
<td>Comprehensive 5 year of warranty</td>
</tr>
<tr>
<td>Installation and training</td>
<td>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)</td>
</tr>
<tr>
<td>Note: Necessary items or chemicals required for the installation, demonstration and calibration of the system should be arranged by the supplier</td>
<td></td>
</tr>
<tr>
<td>Other condition on service/maintenance and user list</td>
<td>a. Please provide address of your local service office with availability of number of trained engineers to attend any service issue in HRMS.</td>
</tr>
<tr>
<td></td>
<td>b. Also mention the anticipated down-time of the machine, if there is any service call from us (in minimum days)</td>
</tr>
<tr>
<td></td>
<td>c. A user list containing minimum of 10 recent installations of HRMS (in reputed Indian Institutes/R &amp; 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.</td>
</tr>
</tbody>
</table>

**Item Code: 4**  
**GAS CHROMATOGRAPH-MASS SPECTROMETER (GC-MS)**  
**Gas Chromatograph Specification**  
- Injector: Split/Split less injector (Two numbers) with temp range up to 400°C or more; suitable for all capillary column and standard column using adaptors.
- Oven temperature: Ambient to 450°C.
- Ramp rate: up to 120°C/min or more with multiple temperature ramps.
- Cooling down time from 450°C to 50°C should be mentioned
- Capillary flow technology, Effluent splitting, back flushing, column switching
- Dual channel PPC control system

**Mass Spectrometer (Single Quadrupole)**  
- Mode of operation: EI with full scan (FS), SIM, and FS/SIM simultaneous within sample injection, CI
- Ion source material: Noncoated or equivalent
- Ion source temperature 150 to 350 °C
- Filaments Dual filaments for EI
- Electron energy 10 to 100 eV
- Mass axis stability < ± 0.10 u over 24 hours (10 to 40 °C)
- Mass range: 10 to 1000 or better
- Scan rate: 12000 u/s or better
• Tuning: Autotune or manual
• Detector: Electron Multiplier
• Vacuum Turbo molecular pump with 250 L/sec flow or better
• Latest version of NIST library
• Suitable Software for Mass Hunter acquisition, data handling (quantitative/qualitative) and reporting.

**Column:**
Suitable application specific column mass column with compatibility for GC: 04 Nos.  
**All columns should be quoted with detailed specification and applications.**

**Indigenous items:**
• 5 kVA UPS with back up time for 30 min and branded battery
• UHP grade helium gas cylinder (filled) with double stage SS regulator – 01 No.
• iolar grade-1 nitrogen cylinder (filled) with double stage SS regulator – 01 No.
• Gas Panel
• Branded Desktop Computer (Intel core i5 or better processor, DVD Writer) and Laser printer

Necessary tools for changing column, filament, detectors and others should be supplied with the system

Others: List of users, warranty and other essential terms are to be mentioned.

**Item Code: 5**

**ADVANCED SPECTRAL CONFOCAL LASER (Confocal microscope with live cell imaging)**

**Scanning Microscope:**
1. The confocal microscope should be the state-of-art technology suitable for live and fixed biological samples. The system should be highly sensitive by optics and detection device meeting various needs of modern biological applications including live cell imaging with FRAP, FRET, FLIP, photo-activation and photo-conversion experiments. The system should be onsite upgradable to advanced imaging techniques on site in future like Multiphoton, FLIM etc.

<table>
<thead>
<tr>
<th>S. No</th>
<th>SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Fully Motorized Inverted Fluorescence Research Microscope</td>
</tr>
<tr>
<td>1</td>
<td>BF/DIC/Fluorescence with dedicated built in touch screen / TFT display for controlling all motorized components of the microscope, including objectives, motorized stage, light path etc</td>
</tr>
<tr>
<td>2</td>
<td>Programmable motorized X-Y scanning stage, Universal sample holders for slides, 35/60 mm Petri dish, labtek chambers, multiwall plates with multipoint, tile and mosaic imaging Software</td>
</tr>
<tr>
<td>3</td>
<td>Galvo / Piezo stage for fast YZ/XZ sectioning with travel range of 100 micron or better and speed of minimum 100 mm/second or better</td>
</tr>
<tr>
<td>4</td>
<td>12V/120W metal hallide (Minimum 2000 hrs life) (with 10 extra bulbs) / white LED illumination (Minimum 20000 hrs life) for transmitted light</td>
</tr>
<tr>
<td>5</td>
<td>Motorized 6 position DIC nosepiece, Universal Motorized Condenser NA 0.55 or better with modules for DIC,</td>
</tr>
<tr>
<td>6</td>
<td>Minimum 6 positions fluorescence turret for accommodating fluorescent filters for sample visualization</td>
</tr>
<tr>
<td>7</td>
<td>Built-in High precision Z-focus drive with step size of 25 nm or better</td>
</tr>
<tr>
<td>8</td>
<td>The objectives from 10x – 63 x should be UV-vis-IR corrected.</td>
</tr>
<tr>
<td>9</td>
<td>High resolution confocal grade objectives of Plan Apochromat 10x /N.A= 0.30. or better</td>
</tr>
<tr>
<td></td>
<td>High resolution confocal grade objectives of Plan Apochromat 20x / N.A= 0.70 or better</td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>11</td>
<td>High resolution confocal grade objectives of Plan Apochromat 40x / N.A= 1.3 or better with oil immersion</td>
</tr>
<tr>
<td>12</td>
<td>High resolution confocal grade objectives of Plan Apochromat 60x / 63x / N.A= 1.40 oil immersion or better</td>
</tr>
<tr>
<td>13</td>
<td>Automated shift free DIC accessories for all objectives</td>
</tr>
<tr>
<td>14</td>
<td>Band pass fluorescent filters for CFPYFP DAPI GFP Cy3/DsRED/RFP/Cy5</td>
</tr>
<tr>
<td>15</td>
<td>Active anti-vibration table with compressed air damping, bread board table top with M-6threading for the complete microscope system. The table must be integrated from the factory of the OEM of the microscope.</td>
</tr>
<tr>
<td>16</td>
<td>Eyepieces: FOV 20mm or more</td>
</tr>
<tr>
<td>17</td>
<td>Eyepieces Anti fungus type 10X/B with diopter adjustment in both eyes</td>
</tr>
<tr>
<td>18</td>
<td>Eyepieces: eye cups along with eyepiece dustcover</td>
</tr>
</tbody>
</table>

**B Spectral confocal imaging unit with built-in high sensitive detectors**

1. **DETECTION**: Laser point scanning and Confocal detection unit with built-in Spectral PMT and HyD/GaAsP Spectral detectors.

2. Should be capable of simultaneous detection and separation of 5 fluorophores out of which at least 3fluorophores based on high sensitive GaAsP/HyD or equivalent detectors with QE 45% or more.

3. All spectral detectors should be tunable

4. Transmitted PMT for laser based DIC imaging should be included

5. Scanner unit should have laser ports for Vis, UV and IR lasers.

6. Scanner unit should include high efficient excitation laser suppression beam splitting device with low angle of incidence optics

7. **SCAN RESOLUTION**: Maximum scan resolution should be at least 8Kx8K or better at20mm imaging field of view.

8. The scanner should have "ROI" scan capability for fast scan

9. **SCAN SPEED**: All scanning speeds should be mentioned at full format, without line skipping and using spectral GaAsP detector.

10. Scan speed should be 7-10 FPS @ 512x512 or 20FPS or more @512x512or better @ 512X32 100 fps or better @ 512X16

11. The scan head should be able to perform fast dynamic live cell time lapse imaging

12. **SCAN AREA**: The scan field diagonal should be 20 mm or better.

13. Scan Zoom range 1X to 40X or better with increments of 0.1X.

14. System should be capable of doing XY, XYZ, XYZ t λ, XYZ t λ, pos. XZ, YZ position modes without any limitations

**C Laser module with AOTF (Accousto optical tunable filters) control**

1. Complete set of laser lines as mentioned below should be the part of standard supply with the system with complete warranty of 5 years or 10000 hours life, whichever is earlier.

2. Minimum of 10 years of complete support on Lasers.

3. All Lasers should be used for imaging and bleaching experiments

4. a). Blue diode (UV) Laser 405/408nm or equivalent solid-state laser with minimum 30mW or better

5. Solid state laser 488 / 448/458 with minimum power 15mW

6. Solid state Laser 514nm or equivalent solid-state laser with 15 mw or better

7. d) DPSS 561/552/ 594 nm or equivalent solid-state laser with 15 mW or better.
<p>| | |</p>
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<tbody>
<tr>
<td>8</td>
<td>e) HeNe 633 nm or equivalent with 15 mW or better.</td>
</tr>
<tr>
<td>9</td>
<td>All visible lasers should be connected to the scan head through fiber optic cable and should be controlled through AOTF for fast laser switching and attenuation in pixel precise synchronization with the laser scanner for Region of Interest (ROI) scan for FRAP, Photo activation/conversion experiments.</td>
</tr>
<tr>
<td>10</td>
<td>All the laser lines should be controlled through a computerized AOTF device for fast lasers witching and attenuation.</td>
</tr>
</tbody>
</table>

**D Control computer and Monitor:**

| 1 | **Online computer specifications:**
|   | Latest 64 bit control computer with Intel Xeon Multi Core Processor, DDR RAM minimum 64 GB, Minimum 6 TB Hard disk or better, DVD, Graphics card 5 GB at least, Win 7/10 Ultimate 64 bit , USB 2.0/3.0, Fire wire. Large 30” LCD/TFT monitor. |

**E System control and Imaging Software:**

| 1 | Software should be capable of controlling Motorized components of microscope, digital camera, confocal scan head, laser control including AOTF and Image acquisition & processing for confocal and super resolution imaging. |
| 2 | Saving of all system parameters with the image for repeatable/reproducible imaging. |
| 3 | Line, curved line, frame, Z-stack, Time series imaging capabilities. |
| 4 | High dynamic range imaging capability |
| 5 | ROI bleach for FRAP, Photo-activation/conversion experiments. |
| 6 | FRET imaging as well as Quantitative data analysis capability. Program modules for FRET/FRAP should be included |
| 7 | Standard geometry Measurements like length, areas, angles etc including intensity measurements. |
| 8 | Advanced 3D image reconstruction with rendering from a Z-stack image series. |
| 9 | Co-localization and histogram analysis with individual parameters. |
| 10 | Spectral un-mixing with fingerprinting for separation of overlapping excitation/emission spectra of fluorophores. |
| 11 | Software should be capable of making 3D movies / clippings |
| 12 | Detectors/software for high dynamic range imaging or equivalent |
| 13 | Piezo / Galvo attachment for faster travel in Z, XZ and YZ imaging capability with depth of 100nm or better with minimal increment of 10nm or better |

**F ADDITIONAL ITEMS**

| 1 | Facility for live-cell imaging including light blocking environmental box-based system with Temperature, CO₂, humidity control and complete safety regulations should be offered. The parameters for Incubation system should be controlled by confocal software. |
| 2 | Monochrome Cooled CCD microscope camera with 2 megapixels or more, Sensor size of 2/3” or better, frame rates of 30 fps or better at full resolution, QE of > 70% @500nm. The camera should be either FireWire based /USB III controlled by the same confocal software for multichannel, z stack, time lapse wide field imaging. |
Super Resolution Imaging Facility:
System should be able to achieve resolution of 120 nm in XY or better and 400 nm in XZ or better by SR imaging. A dedicated super resolution module should be provided for one click SR imaging in almost real time using GaAsPs based detectors. One Click SR imaging for multiple colours simultaneously should also be available. Scanning speed in Super resolution mode should be as same as with the confocal system or better. The offered SR system should be supported with brochure and company weblink.

1. The system should be quoted with 5 years comprehensive warranty with FOR Delivery Terms
2. An online 5KVA UPS with minimum half an hour back-up should be quoted
3. The vendor will be responsible for the site preparation of the Confocal installation facility.

- Offline computer specifications:
  - Latest 64-bit control computer with Intel Xeon Multi Core Processor, DDR RAM minimum 64 GB, Minimum 6 TB Hard disk or better, DVD, Graphics card 5 GB at least, Win 7/10 Ultimate 64 bit, USB 2.0/3.0, Fire wire. Large 30” LCD/TFT monitor.
  - An appropriate height adjustable chair/stool for the confocal microscope
  - The offline computer must have microscope system software with all modules to carry out all the image analyses experiments “E-system control and Imaging software” above.
  - The vendor must provide a separate at least 1.5 KvA UPS with the offline system
  - The vendor must provide an appropriate computer table and chair for the offline system
  - Fluorescence grade Immersion oil for the confocal objectives – 24 vials

Item Code: 6
FLOW CYTOMETER
High-end Flow cytometer analyser cum cell sorter
1. Bench top flow cytometer/ Cell Sorter required with at least 3 lasers i.e. 488 nm/equivalent blue Laser, 633-642 nm/equivalent Red laser and 405 nm/equivalent Violet Laser.
2. The system should be cuvette based fixed aligned or jet-in air system with minimal alignment of cell sorter.
3. The system should have at least 8 fluorescence/colour (10 parameters or more) measurement capability simultaneously from given 3 lasers, upgradable to more colours.
4. System should have minimum 3 beam spots/pin hole without any customization with the base instrument.
5. The system must have at least 100 microns nozzle and the nozzle tip can be removed during operation, replaced and stream optimized.
6. No manual alignment of nozzle to be done by the user even after removal and replacement of the nozzle into the system.
7. The system must be of closed architecture in order to avoid accidental exposure to lasers, optical paths and filter assembly.
8. The system should be able to acquire & sort at least 25,000 or more -events/second.
9. The system should have automatic instrument setup and tracking feature. There should be automatic Levey-Jennings plot available to track instrument performance at any point. The system should be able to set up laser delay automatically during daily setup.
10. The system should be able to sort 2 to 4 ways. The system should also have option of automatic cell deposition unit which allows for slide and plate sorting into 6, 24, 48, 96 and 384 plates.
11. Temperature control: adjustable through software. System should capable of adjusting through software. Sample flow should be automatically stop when the sample tube is empty.
12. The analysis software with baseline settings must be provided along with instrumentation system.
13. System must have the ability to alert the operator via email and audible alarm, in case of sorting interruption
14. The system should be able to set up drop delay automatically with or without bead.
15. Viability & yield should be more than 80% or better.
16. System should have automatically track sorted volume to avoid the overflow of collection vessels.
17. Latest compatible data workstation (computer) with all system software and LCD monitor (24” X2), 4 GB RAM, 1 TB HDD, network card and colour laser printer should be quoted with the system.
18. Compatible online UPS with 1 hr backup and colour laser printer should be quoted with the tender.
19. Starter kits and reagents should be quoted with the system which includes sheet fluids, tubes, tracking beads, and cleaning & compensation kits.
20. Buffers, washing reagents and other consumables such as, sheath fluids, tubes, calibration beads, cleaning kit and compensation kit compatible with the instruments must be provided adequate for the first 1000 runs or satisfactory installation whichever is later.
21. System must have upgradability option with Bio-safety cabinet.
22. 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.
23. Bidder should ensure availability of spares and service for 10 years from the date of installation and commissioning.
24. Multiple on-site training for system & software should be provided.
25. Additional high-end research analysis software from FlowJo should be provided.
26. Application and service training should be provided directly from the company.
27. Comprehensive warranty of 5 year to be given. Post warranty 2 years AMC should be quoted additionally.
28. Competent technical manpower to run the system should be provided by the company for 5 years.

Item Code: 7
RESEARCH CRYOSTAT (PROPRIETARY ITEM) (Cryo microtome)

<table>
<thead>
<tr>
<th>Specifications: RESEARCH Cryostat: FULLY MOTORIZED: Leica CM3050S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freestanding, motorized open-top cryostat with independent specimen temperature control.</td>
</tr>
<tr>
<td>Spacious, easy-to-clean cryochamber with illumination.</td>
</tr>
<tr>
<td>Removable heated glass sliding window.</td>
</tr>
<tr>
<td><strong>Cryochamber temperature setting down to 40 °C in 1° steps.</strong></td>
</tr>
<tr>
<td>Permanently cooled (down to -45 °C) quick-freeze shelf for 10 specimen discs. Extremely fast Freezing</td>
</tr>
<tr>
<td>Programmable automatic 24-hour defrost cycle.</td>
</tr>
<tr>
<td>Defrost cycle duration programmable from 6 to 12 minutes. Additional manual defrost feature.</td>
</tr>
<tr>
<td><strong>The most important settings such as cutting speed range, cryochamber and specimen temperature, defrost time and duration, coarse feed and object temperature can be conveniently and accurately preselected by simply pushing a BUTTON; Section THICKNESS selection located on CONTROL Panel</strong></td>
</tr>
</tbody>
</table>
Microprocessor-controlled. Foil-protected control panel with locking key to prevent inadvertent changes of programmed parameters.

Menu-driven operation in 5 languages (German, English, French, Spanish, Italian) via LCD display.

**Counterbalanced handwheel with SPRING Balance Force Compensation Mechanism to ease stress while rotating hand wheel,**

Handwheel lockable in two positions, for manual sectioning. Locking status indicated on display.

**Highly efficient insulating materials used in the vacuum panels lead to power savings of approximately 10 % compared to regular heat insulation systems. This new feature enhances the durability of the refrigerating system and safeguard stable cryochamber temperatures, even when there are unfavourable environmental conditions at the installation site.**

Motorized sectioning operated via control panel and foot switch.

Section counter with reset. Sectioning window adjustment.

Handle of the handwheel can be centered in motorized operation.

Emergency stop switch.

3 sectioning modes: intermittent, single and continuous stroke.

2 sectioning speed ranges selectable:

- 0.1 - 170 mm/s
- 0.05 - 100 mm/s

Additional maximum speed setting of: 210 mm/s

**Specimen temperature control:**

Specimen head with specimen temperature control.

Temperature setting range: -10 °C to -50 °C in 1° steps.

Specimen quick-freeze feature.

Manual defrosting.

**Section thickness range:**

- 0.5 to 300 µm selectable
  - in 0.5 µm increments from 0.5 to 2 µm,
  - in 1 µm increments from 2 to 10 µm,
  - in 2 µm increments from 10 to 20 µm,
  - in 5 µm increments from 20 to 60 µm,
  - in 10 µm increments from 60 to 100 µm.
  - in 50 µm increments from 100 to 300 µm.

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.

**Motorized coarse feed:** 500 µm/s and 1000 µm/s

Convenient section thickness selection from outside the cryochamber

Reproducible high-quality thin sections via step motor specimen feed

Programmable reverse section counter (preset counter)

Spacious cryochamber, easy to clean/disinfect
Section thickness totalizer; Battery-powered electronic memory back-up
Low-maintenance design gives convenient access to the cooling system from outside the cryostat housing
Low maintenance, durable refrigerating system
Encapsulated microtome to support efficient low-temperature spray disinfection
Various sectioning programs selectable

Should have installations in East India in which reputed Government Universities/Colleges must have for Research Purposes
Should have dedicated Service Support only for East India with a team of service engineers (at least 3 persons) headquarter in Kolkata, having their office in Kolkata for better support of East India.
Should have European CE & USFDA Approved certificate

Item Code: 8
HIGH-THROUGHPUT DNA SEQUENCING MACHINE (NGS cum genetic analyser)

- System should be able to parallelly sequence millions of DNA fragments from multiple sample sources (microbial and higher eukaryotes including human) economically within a short turnaround (sequencing run plus analysis) time.
- System should be fully automated sequencing workflow, walk-away operation, without much user intervention, for template amplification to analysed data on a single machine.
- The data analysis module should enable real time, on-instrument image processing, base calling, read alignment and variant calling without the need for ancillary equipment.
- The instrument should be able to address the applications like sequencing large genomes, parallel sequencing of multiple microbial genomes, targeted sequencing and resequencing high throughput sequencing of metagenomes, single cell analysis. sequencing of whole transcriptomes and exome, small RNA sequencing, methylation analysis, and resequencing of targeted gene panels.
- One single NGS system should have the flexibility to accommodate all applications mentioned above with maximum data output up to 150GB per run.
- The sequencing chemistry should be able to support different read lengths ranging from short to long reads up to 1-2 Mb in a cost-effective manner in single run for accommodating different types of applications.
- The sequencing technology should offer accurate sequencing of homopolymers and repetitive regions in the genome of 15 bases or more and highest read quality score of Q30 for more than 75% of the base calls having >99% accuracy ensuring quality control steps.
- The system should have a reasonable runtime to perform integrated massively parallel sequencing of DNA/RNA libraries loaded directly on the system and real time analysis of the run.
- The quoted system should be an upgradable one later without the need to change the platform as such, for addressing application specific future requirements.
- The quoted system should offer flexibility that fits varied throughput requirement as per application need. Versatility should enable user to run both small and large-scale projects on a same platform without any requirement of upgradation or change in platforms.
- The system should also include an option to integrate with the genomic computing environment, an easy, secure and cost-effective way to store, analyse, and share genomic data.
• The system should include latest software, hardware, accessories and technology available at the time of installation which is needed for generating high quality sequence reads. Initially all the necessary kits, reagents and other consumables needed for the runs during both the installations and training will be provided by the supplier at no extra cost.

• Future upgrades in the instrument or chemistry should be provided at no extra cost.

• The vendor should provide a quote for the necessary inventory of the critical spare parts required for the instrument.

• The vendor should undertake to supply the reagents to be used with the machine upon every demand raised by the users for at least 10 years from the purchase of the machine even if the machine becomes obsolete and discontinued.

• The vendor should undertake to supply the spare parts (including critical and others) to be used in the machine upon every demand raised by the users for at least 10 years from the purchase of the machine even if the machine becomes obsolete and discontinued.

• The vendor should ensure proper and smooth functioning of the equipment by supplying appropriate product care which includes full coverage for parts, labour and travel; Reagent replacement upon hardware failures; zero product maintenance; Remote Technical Support hardware/software updates; On-site applications support; Discounts on advanced training.

• The vendor should also supply the specific vibration free table for the installation of the NGS system(s).

• The vendor should supply one 8 KVA branded UPS with at least one-hour backup along with the system.

• The vendor should quote for 5 yrs. CMC and AMC separately. The warranty will commence only after the system is successfully installed.

• The manufacturer should also provide kits and reagents and enzymes minimum for 100 samples for library preparation from DNA/RNA.

• The system should have an option of integrating with a cloud-based computing environment, for data storage, sharing and analysis. In addition, there should also be an option of a deployment of an onsite server, for the same functions.

• System should include on board computer hardware (branded) for data processing with 128GB RAM and usable storage capacity of 12Tb or more. It should be supplied with necessary software to convert signals to base calls, various plug-ins etc. along with suitable analysis software.

• The sequencing chemistry should be robust and globally proven, demonstrated with peer reviewed publications.

• System should offer the user-friendly sequencing experience, such as, intuitive touchscreen user interface, RFID tracking and pre-mixed/pre-filled integrated reagent cartridge for minimal user intervention.

• Vendor should have established lab in India having quoted technology to support for troubleshooting and training.

• Vendor should be able to provide details of bioinformatics services available in India to help in data analysis as required.

• The System must be supplied with all accessory equipment’s that may be essential to make the platform fully functional, required for starting the run till the results are analysed.

• Apart from the list of equipment provided by the supplier (including the ones provided by the supplier and the others which are needed to be procured separately), there must be no other equipment needed to carry out the high-throughput sequencing. In case, if anything is needed and not specified by the supplier, it will be provided by the supplier at no extra cost.
• Purchase of the instrument must include, System installation and operator training performed by a vendor service engineer, Regional technical support/applications training, On-site, in-lab customer training, Technical phone support and data analysis training.
• The manufacturer must provide a suitable computer/laptop with the software’s pre-installed to run the NGS platform. Operation manuals and maintenance manuals should be included in the consignment, two extra copies of the operation software (in hard disks) should be made available as precautionary measure.
• Training about usage of the instrument (Hardware and software) must be demonstrated to at least three individuals free of cost. b. Analysis of the sequencing data like quality check, de-multiplexing, base calling, etc. must be demonstrated. c. For training and demonstration purpose flow cells and reagents required preparing libraries and for running flow cell must be provided free of cost.
• The manufacture should be able to provide certificated for providing service and become an Authorized Service Provider in future.

**Item Code: 9**

**HIGH PERFORMANCE THIN LAYER CHROMATOGRAPHY (HPTLC)**

• Single software to link, control, integrate, manage the individual instruments for application, development, scanning and image documentation
• Server based system with Library available for life time downloadable internet
• automatic data back-up and restore facility
• Sprays sample to layer, Quantitative analysis, Micro-preparative chromatography, Superimpose international standard or derivatization reagent in same method
• In situ clean-up
• Automatic rate of sample dispensing, Self-diagnosis
• All glass, moulded, one piece, bubble free chamber
• UV Cabinet: Short wave UV, long wave, Visible light
• High tech 50 kHz power supply for flicker less, instant illumination
• Auto switch off
• Thermal sensor and tilt sensor built in for user safety
• Uniform heating of plate. Digital display of set & actual Temp
• System Manager controlled Scanner / Densitometer for automatic spectrum scanning
• Automatic quantitative measurement by absorbance & fluorescence
• Reproducibility of positioning better than 50µm in Y direction & 100µm in X direction. Scan speed 100nm/sec @ 25µm resolution; Quick scan facility; Wavelength range 190-900 nm; Wavelength accuracy better than 1nm and reproducibility better than 0.2nm.
• Monochromator flushing by nitrogen; Data sampling rate – 4000 / sec
• Special Macro optics for TLC & Micro optics for HPTLC.
• Apochromatic, high purity synthetic fused silica materials with excellent physical and optical characteristics from UV to the near IR, fluorite lens system
• Spectrum scan speed 100 nm / sec; Max 999 spectra / plate
• Visible pilot slit image / scan compartment illumination with UV for sample alignment check with scan beam; D2, Hg, W lamps built-in
• High reproducibility
• Data evaluation 32-bit software (latest version), Excellent Signal / Noise ratio
• compressive 05 years warranty
• Levels of training to be specified
Item Code: 10
AUTOMATED PROTEIN PURIFICATION SYSTEM

- Versatile modular liquid chromatography system for fast and reliable separations of proteins
- Should allow microgram to milligram quantities of protein operating at flow rate of 0.001ml/min to 10ml/min without need for changing pump heads for entire flow range and pressure limit 0.5- 25MPa.
- Accurate, automatic gradient formation from 0 to 100% gradient over the entire flow rate range of 0.5 to 5 ml/min with an accuracy of ± 5%
- System should require minimal bench space, should come with its own cold chamber. System should monitor wavelengths for UV-Vis detection (280 nm with absorbance range of -0.1 to +2 AU), conductivity (0 to 300 mS/cm), pH () and other parameters.
- Should have versatile fraction collectors from microtitre plates to test tubes to support collection of at least 30 fractions in a single run
  - 1.5ml/2.0 ml Micro Centrifuge
  - 5 ml tubes
  - Centrifuge tube 12ml
  - 15 ml tubes
- Outlet valve options should be available to direct the flow to the fraction collector or waste
- The system should have options for loading the sample such as directly using the pump, using a loop (25 μl to 5 ml) or super loop (10 ml to 150 ml) through injection valve using syringe.
- Should have reliable system control with user friendly software (system includes PC) and System software should have the capability to be remotely accessed through secured firewalls from the vendor’s site globally for diagnosis and support
- Accessory items supplied with system: each one of superdex 200 (~3ml column), 5ml prepacked cation, anion exchanger column, Ni-NTA, GST –affinity purification columns for 3-400 kDa.
- System uses four pump heads permitting accurate flow and gradient over a wide range of flow rates. System should be capable of upgrading to 100ml/min increments of .01ml/min
- Xenon fast lamp in UV monitor with fiber optics for high sensitivity and long lamp life.
- User programmable column library for application protocols, method templates and columns & techniques including polymer-based RPC.
- Automatic pressure compensation for very high flow rate accuracy
- Program Memory: programmable up to 99 programs
- Drop Synchronization is possible
- Wider conductivity ranges from 1 us/cm up to 800 or more us/cm, Operating Temperature 4-40 degree C; cold room compatible, Time mode 0.01-9.999 min; Volume mode 0.1-999ml. PH monitor measures both conductivity and pH with temperature compensation Wide dynamic range from 0-14 pH units.
- Voltage:100 to 120/220 to 240 VACS
- Power consumption:300VA

Item Code: 11
INDUCTIVE COUPLED PLASMA-OES (ICP-OES) SYSTEM

1. Polychromator/Double spectrometer based ICP-OES for simultaneous for elemental & heavy metals analysis in drinking/waste/ground/raw waters, sewage, sludge, soil samples etc. in ppb to % range. (Provide supporting application notes of the quoted model).
2. RF Generator: Solid state free running with 27/40-MHz frequency with fast impedance matching for various matrices.
4. Power efficiency: Greater than 80% with < 0.1% variation in output power stability.
5. Power output: 1500 Watts or greater.
6. Radial, Axial & DUAL View enabled optical system.
7. Plasma ignition and safe switch off shall be totally automatic and PC controlled.
8. Quartz torch preferred for analysis of most difficult, high-matrix samples without dilution assuring minimum consumption of Argon gas (value must be mentioned) to 12 L/min and avoid sample clogging in injector and possible carry over/memory effect in between two samples.
9. Compressed Air or any other advanced mechanism for removal of Cool of Tail Plasma.
10. Torch Assembly: Demountable type with Alumina Injector for corrosion resistant to all acids including 30% w/v hydrofluoric acid.
11. All Safety interlocks for water flow, argon pressure, shear gas flow, plasma door, plasma stability, safe shut down of plasma etc., should be built-in.
12. Peristaltic Pump: Integrated four-channel, computer-controlled pump with variable speeds from 0.2 to 7 mL/min in 0.1 mL/min increments or better.
13. Instrument should be enabled with automatic stabilization within 10 min from cold start and ready for analysis.

Gas Flow Control
- There should be three independent software-controlled gas flow for Plasma, Auxiliary and Nebulizer gases using mass flow/volume flow controller system software.
- Nebulizer argon gas flow should be variable between 0 and 2.0 L/min in 0.01 L/min increments using a built in Mass Flow Controller.

Optics
- The system offers high speed, high light through put based on polychromator/double spectrometer-based Spectrometer with 2D Echelle diffraction spectrum with fine Grating

Solid State Detector
- UV-sensitive, latest solid-state CID / CMOS / CCD with full spectral coverage & 100 % active area. Array detector with cooling facility using a single-stage integrated Peltier cooler operated at approximately -8 °C or less
- Wavelength Range: 180 nm or less – 750 nm or more.

Software
- The software should be based on Industry Standard MS-Windows Environment having standard conditions of various elements shall be built-in and one can select these conditions by entering elements involved
- Software should be capable of controlling instrument functions like plasma ignition; gas flows, viewing position, operation of autosampler etc. smoothly

Expected Performance
- Prominent peak in spectral lines for wavelength.
- Controlled and continuous enhanced flow type hydride/vapour generation system.
- Capability of analysing high TDS and particulate sample

Accessories
- Chiller (Imported make) for RF Generator shall be supplied along with basic system.
- Multielement (Al, As, B, Cd, Co, Cr, Fe, Hg, I, K, Mg, Mn, Mo, Na, Ni, P, Pb, S, Se, Sn, V, Zn, Mr, Sr) NIST certified standard solution 1000 mg/l for calibration to be quoted separately.
- Sample introduction assembly should contain at least 2 torches & 2 injectors
- Automated Hydride generation kit must be quoted.
- Organic Sample Introduction Kit must be quoted
- The system shall include an auto sampler capable of performing automatic analysis and should have minimum 150 vial positions of ≥ 15 mL vial capacity. Two rinse bottles (containers) of ≥ 2 L size should be provided along with autosampler. Autosampler should be provided with integrated cover (lid) to avoid any contamination from environmental dust

**Microwave Digestion System (Optional accessories):**

- Basic application of Microwave Digestion System: Digestion of environmental and industrial samples like soil, sediments, rocks, plant, sludge, coal fly ash, ores, alloys etc. using all major acids like HNO₃, HCl, H₂O₂, HF, H₂SO₄, H₃PO₄ etc. to determine metals
- **Microwave (inbuilt):** 2000W from 2 magnetrons (2 x 1000W) power
- **Microwave Output:** 1500W peak output power
- **Microwave control:** Unpulsed control over entire range, adjustable in 1% increments
- **Temperature programming:** Direct temperature control in real-time, measures the actual sample temperature in each individual vessel
- **Pressure programming:** Direct pressure control; contact-free, optical sample pressure measurement system for reference vessel
- **Overpressure venting:** Integrated Gas Containment outlet
- **Main unit:** Made of stainless steel with heat-bonded part covered with fluoropolymer (PFA Perfluoroalkoxy) coating
- **Sample digestion vessel:** Solid TFM fluoropolymer construction for body, pressure seal and screw cap with TFM fluoropolymer liner, volume capacity 100 mL, recommended pressure 100 bar operating temperature for vessel: ambient to 250 °C Range, Metal Rupture Disc to Protect overpressure
- Should comply CE Safety and EMC emissions compliance NRTL and FCC safety and emissions compliance, REACH, WEEE, RoHS
- Consumables like rupture disk should be provided for 100 samples run.
- Exhaust system up to 10 feet duct, should be provided.

**Indigenous Items:**

- Branded PC (Branded Desktop Intel core i5, Windows 10) with Branded LaserJet Printer
- Exhaust Hood.
- UHP grade Argon Gas Cylinder (4 Nos), UHP grade Nitrogen Gas Cylinder (3 Nos.) with double stage SS regulators (2 Nos)
- 15 KVA branded online UPS with 30 mins back up.

**Note:**

- Supply, installation and commissioning and training of users of the instrument for the whole instrument set-up at Utkal University, Bhubaneswar to be provided
- The supplier should provide - Three years full instrument onsite warranty and services, Certificate for the availability of spares for 10 years
Item Code: 12
ULTRAPURE WATER PURIFICATION SYSTEM

Specification:

Stage-I
- Water Purification System including:
  - EDI Elect Deionisation Module with automatic and continuous deionization
    - Pump (Variation of pressure in function of temp. This is to guarantee constant flow rate and low noise
  - EDI Technology: Constant quality & Continuous performance
  - Check Valve to prevent back flow on RO
  - Recirculation Loop to save water
  - Automatic Sanitisation (Alarm on display, no need to open system – easy to perform rinse and flush of the system automatically, no manual intervention) conductivity and resistivity meters, percentage rejection and set point with alarm, inlet pressure, pressure on RO cartridge, water level in tank, EDI Module, flush/rinsing /standby /operate mode,
  - Alarm signals at low pressure and quality below set point
  - Wall mounting or bench
  - Alarm exchange pack
  - Auto-diagnosis of electronics/ auto test of all measurements
  - RS232 Connection (GLP printout function)
  - No softener
  - No manual reset of timer needed
  - Software based, Memory of actions and quality kept in memory for 1 year
  - Option of Validation services
  - PROG0002: Progard cartridge:
    - Pre-treatment with activated carbon with 3-micron prefilter and anti-scaling compound
  - FLOW RATE: 3 L per hour
  - RESISTIVITY: >5 MΩ.CM
  - TOC: < 30 PPB

Stage-II
- Temperature: 2 to 35°C
- Flow rate: 1.5 l/min
- RESISTIVITY: - 18.2 MΩ.CM
- BACTERIA: <0.1 CFU/ML
- TOC: <5 PPB
- Particulate: < 1 particulate/ml.
- Bacteria: < 0.1 cfu/ml
- Endotoxin/pyrogen: <0.001 EU/ml.
- RNase: <0.01ng/ml
- DNase: <4 pg/µl
- Electronic Connection: RS-232
- Electrical Requirements: 230 volts
- PROGARD KIT
- SYNERGY KIT
- MAX CATRIDGE 1 & 5 µ
- Tank 50 litres
- Iron removal filter
- Prefilter
- Warranty/Guarantee should be mentioned
- Optional: Recommended voltage stabilizer (Servo)-3kV

**Item Code: 13**

**X-ray fluorescence spectrophotometer**

**Bench top X-ray fluorescence spectrometer (specification)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Elemental range</strong></td>
<td>Sodium to uranium (Na – Am)</td>
</tr>
<tr>
<td></td>
<td>Carbon to americium (C – Am) with light element (LE) detector</td>
</tr>
<tr>
<td><strong>Concentration range</strong></td>
<td>From ppm to 100 %</td>
</tr>
<tr>
<td><strong>X-ray tube</strong></td>
<td>Pd or Ag anode; max. power 50 W; max. voltage 50 kV (low kV version: 30 kV max.)</td>
</tr>
<tr>
<td><strong>Primary beam filters</strong></td>
<td>10-position automatic filter changer; for wide range elemental analysis</td>
</tr>
<tr>
<td><strong>Detector</strong></td>
<td>Silicon Drift Detector: Peltier cooled (without liquid nitrogen)</td>
</tr>
<tr>
<td><strong>Collimator masks</strong></td>
<td>For small spot analysis: 1, 3, 8, 12, 18, 23 and 28 mm</td>
</tr>
<tr>
<td><strong>Sample observation</strong></td>
<td>Integrated HD video camera, for exact sample positioning and documenting the measurement position of a sample</td>
</tr>
<tr>
<td><strong>Atmosphere Mode</strong></td>
<td>Air mode: For heavier elements in all sample types</td>
</tr>
<tr>
<td></td>
<td>Helium mode: Best performance for light elements in liquids and loose powders</td>
</tr>
<tr>
<td></td>
<td>Nitrogen mode and vacuum mode operation</td>
</tr>
<tr>
<td><strong>Connectivity</strong></td>
<td>Built-in Ethernet port RJ45, 3x USB ports for mouse, keyboard, printer</td>
</tr>
<tr>
<td><strong>Power requirements</strong></td>
<td>100-240 V, 50/60 Hz, max. power consumption 600 VA</td>
</tr>
<tr>
<td><strong>Sample types</strong></td>
<td>Loose powders, granules, solids, pressed pellets, fused beads and liquids</td>
</tr>
<tr>
<td><strong>Control (operation)</strong></td>
<td>Touch screen control</td>
</tr>
<tr>
<td><strong>Sample sizes</strong></td>
<td>Up to 51.5 mm (Liquids, loose powders and smaller samples in liquid cups: up to 50 ml)</td>
</tr>
<tr>
<td><strong>Sample loader</strong></td>
<td>Single position, manual loading</td>
</tr>
<tr>
<td><strong>Quality &amp; safety</strong></td>
<td>Fully radiation-protected system; radiation &lt; 1 μSv/h (H*); Compliant to ICRP/, IAEA, EURATOM</td>
</tr>
</tbody>
</table>

**Item Code: 14**

**CARBON DIOXIDE (CO₂) INCUBATOR**

1. CO₂ incubator with 165 Lt of internal capacity.
2. Temperature management: 4°C above ambient to 50°C with increment of 0.1°C
3. Temperature accuracy: ±0.4°C at 37°C
4. Temperature uniformity: ± 0.3°C at 37°C
5. CO₂ gas range: 0.1 – 20% with control increment of 0.1%.
6. CO₂ gas accuracy: ± 0.3% at the specified Relative Humidity (RH) at 37°C and ambient 22°C,
7. CO₂ gas uniformity: ± 0.1% at 37°C and ambient 22°C across the chamber
8. CO₂ recovery rate: at least of 6 min after door closing to attain 5% CO₂.
9. Should have six-sided direct heating elements to ensure even distribution of heat throughout the entire incubator chamber.
10. Should come with a removable humidity tray for easy cleaning and refilling of distilled water.
11. Should be “fan less” design to reduce chance of contamination, reduce noise level, minimum air turbulence and bigger usable capacity.
12. CO₂ sensor: Dual Channel Infra-Red (IR), NDIR type with auto-calibration features to ensure accuracy of sensor automatically and should withstand at least 180°C during high the temperature disinfection.
13. High-Temperature Disinfection [HTD] of at least 140°C for 2 hours.
14. Shelves: standard 4 perforated stainless-steel shelves of 1.5 mm thickness.
15. Display: 5inch LCD/ LED display for control of temperature and alarms
16. Should have separate single inner glass door and options for 4-split inner doors or 8-split inner doors
17. Should come with an inline pressure regulator to ensure less gas consumption and prevent overshooting of pressure which shortens life span of incubator.
18. The Inner chamber should be single stainless-steel sheet with deep-drawn and seamless design with no corners, welds or joints for ease of cleaning.
19. The system should have BMS relays built in and option to incorporate onto Data monitoring and documentations modules.
20. Should have optional building management system relays.
21. Should have optional incubator software command which allows tracking key operational information such as time, temperature, CO₂ concentration and humidity.
22. 3 KVA Servo Stabilizer, CO₂ gas cylinder with 30kg CO₂ gas capacity & CO₂ gas regulator must be supplied.

**Item Code: 15**

**BIO SAFETY CABINET CLASS II**

1. The Bio safety cabinet should be Type A2 in which 70% Air should be re-circulated and 30% of the air should be exhausted
2. The Bio Safety Cabinet must include two DC motors. High power consuming AC motors should not be used
3. The motor must automatically adjust the airflow speed without the use of a damper to ensure continuous safe working conditions, even without maintenance adjustments.
4. In order to preserve safety to the user and the environment, the exhaust blower on the cabinet must continue operating when the supply blower stops working. If the exhaust blower should fail, the supply filter will also be turned off.
5. In order to ensure consistent and reliable down flow velocity across the supply HEPA filter over the life of the cabinet, the cabinet must use a pressure sensor (rather than anemometer) to detect pressure drop across the supply filter, rather than in just one point across the down flow. The pressure sensor must be encased in order to protect the sensor from temperature, humidity and other environmental phenomena that can impact the sensor’s performance.
6. The microprocessor must display the inflow and down flow air velocities in real-time on an LED display to ensure the user knows whether or not the cabinet is working under safe operating conditions.
7. The front window must be a 10” sash opening and be made of laminated safety glass to ensure containment of potentially hazardous samples in the case of accidental glass breakage.
8. All interior and exterior parts must be painted or smooth to ensure no risk of cuts to users or maintenance personnel.
9. The cabinet noise level must be less than 63 dB(A) for a 4-foot cabinet as measured in a sound proof room 12 inches in front of the cabinet and 15 inches above the work surface. Lower noise levels promote more comfortable and safer working habits of the user.

10. The Biosafety Cabinet should have microprocessor controller and same must be located on a slanted front panel so it is easy to see and reach from a seated working position in front of the cabinet.

11. The interior of the front window must be accessible for cleaning without requiring the user remove or support the window.

12. The biological safety cabinet must be capable of achieving current state-of-the-art in energy efficiency. A biological safety cabinet with lights on and fan at operating speed should consume less than 200 watts for a nominal four-foot width and have a reduced energy mode for non-operational maintenance on containment in the work area.

13. The cabinet must automatically reduce fan/blower motor speed to 30% when the front window sash is in closed position to ensure reduced energy consumption when the cabinet is not in use.

14. In order to provide maximum effectiveness, efficiency and safety to laboratory Personnel, UV light must be programmable to allow for specific exposure times from 0 to 24 hours. The automatic shut off feature on the UV light saves money on replacement of the bulbs.

15. The Cabinet should have provision to fit taps for Vacuum, Water and Non-Combustible Gas.

16. The Bio safety Cabinet should be NSF certified with listing on NSF website. Each

17. Cabinet should have individual sticker of NSF Certification.

18. The Bio safety cabinet should incorporate HEPA filter of the class H 14 EN 1822 or better and having minimum efficiency of 99.995% at 0.3 µm particle size.

19. Approximate Dimension: Exterior 1500 H x 1300 W x 800 D; Interior 800 H x 1200 W x 500 D or more for easy operation.

20. Ventilation System Exhaust and Inflow air volume approx. 300-350 CFM

21. Heat Emissions at 25ºC should be approx. 0.2 KW or lesser.

22. The cabinet Should be provided with Microprocessor controller and large LED display for inflow and Down flow air velocity and hours of operation, Audible and visual Alarms for HEPA filter failure, blower failure, airflow speed failure, Incorrect window position.

23. The BSC must incorporate an LED Indicator to indicate filter loading and should provide visual and audible alarm to indicate excessive HEPA filters loading which can result in unsafe airflows deviation from the NSF recommended inflow and down flows air velocity values measured in meters per second or foot per minute.

24. The cabinet should be provided with fixed / adjustable Height Stand, UV Light and one set of detachable arms rest and one / two electrical outlet.

25. The Drain Pan of the BSC should be made of Stainless Steel. The drain pan should not be painted or power coated.

26. The Bio safety cabinet should have dual side wall with negatively pressurized interstitial space. Bio Safety Cabinet with single glass side walls should not be quoted.

27. The System should have 3 years of warranty & the bidder must have won service centre based at eastern part of India.

28. Voltage Stabilizer: Suitable voltage stabilizer to be offered for operation of the offered system.
**Item Code: 16**

**INVERTED MICROSCOPE:**
1. Inverted microscope frame with minimum 5-watt LED to maintain constant colour temperature through all stages of intensity with auto cut off function to save the energy. 50 W Hg Illumination with lamp housing and power supply.
2. Metal body with scratch resistance stages, Universal Slide holders and object guide must be supplied with the microscope.
3. Long working distance condenser 80 mm for the larger volume cell container must be quoted, longer working distance should be provided as preference.
4. Observation methods: Fluorescence: blue green excitation, UV excitation, Phase contrast, inverted contrast, bright field.
5. Objectives for microscope with Integrated phase slider:
   - 4X Plan Objective
   - 10X Phase Objective NA 0.2
   - 20X Phase Objective NA 0.3
   - 40X Phase Objective NA 0.5
6. 4 Position Objective Holder, Objective holders for Petridis and 96 well plate and tissue culture flasks.
7. 10X Eyepiece with FN 20.
8. Camera Attachment: 5 Megapixel HD camera frame rate 30fps with, Pixel size 2.35X3.35 µm, sensor grade CMOS, Gain:1X-12X, Colour Depth 24 bit.
9. Image capture and analysis software, Basic analysis like linear measurement and Area.
10. The Microscope, camera and software should be supplied from the same manufacturer for better compatibility.
11. Computer System should be provided with the unit having: CPU core i5, RAM -4 GB, HDD-1TB, USB2, OS, WIN7/10 prof 64-bit, external graphics card 2GB, wide screen 21 ‘’ or higher and 2 KVA offline UPS.
12. Should provide 5 Year warranty and 5 years comprehensive AMC.

**Item Code: 17**

**TECHNICAL SPECIFICATION FOR LYOPHILIZER**
- Brushed stainless steel, epoxy-coated Steel exterior with blue accents.
- Upright stainless-steel collector coil capable of removing over 2 litters of water in 24 hours and
- **Ice condenser performance:** Capable of removing at least 2 lit of water in 24 h.
- **Total ice holding capacity** 2 to 3.5 litters before defrosting.
- Ice capacity per day : 1 to 2.5 litters.
- 1/3 hp/ 2x1/3 Hp CFC-free refrigeration system to cool collector to -55 °C / -75°C to -85°C.
- Full Colour capacitive touch screen.
- Real-time display of collector temperature, vacuum level and optional End-Zone end point detection system.
- Start-up mode for collector cool down and vacuum pull down.
- Vacuum Set point, alerts and defrost control.
- Data logging stores and display data Maintenance alerts.
- Automatic defrosting function.
- Ice condensation chamber with high quality stainless steel inner condenser coils and drain valve.
- Drying Chamber made of Stainless Steel with at least 12/16 ports for use of ampoule.
• **Freeze Dryer Manifold:** comprising base plate/adaptor plate, three shelves, and distributors for ampoules/vials. Freeze drying ampoules and vials of 2 to 5 ml capacity (500Nos) must be supplied with system

• **Vacuum Pump (quote Price separately):** High quality corrosion resistant, direct driven, double stage vacuum pump with gas ballast facility and safety valve capable of displacing at least 150 litres air per min for better performance. Pump should include exhaust filter, oil mist and odour filter elements with a spare set. Ultimate Pressure should be at least $2 \times 10^{-3}$ mbar.

• Vacuum break valve

• Safety device to protect vacuum pump from high temperature; oil and air back suction protection.

• Moisture sensors for moisture detection in the drain line

• Vacuum control to maintain set point vacuum level

• Side mounted USB port Rear-mounted Ethernet connection to transmit data

• Electricity requirement: 220-240V, 50Hz

• Ambient temperature: +10°C to +32°C

• Noise level: ≤55dB

• Vacuum Pump with Filter Exhaust, 230V, 50/60 Hz with IEC plug

• Adapter Valve for Ampoule (2 to 5 ml capacity), pkg size to be specified

• Adaptor for connecting the ampoules to the drying chamber

• Mini Stoppering Chamber / Complete sealing device for vials and ampoules in Vacuum

• Chiller system to be supplied along with the lypholizer

• A trolley with wheels to keep the lyophylizer unit, vacuum pump and accessories.

• Servo voltage stabilizer compatible with the system

• International Certification: FDA or equivalent, CE, NeP& ETL certified, ISO 9001 & GMP.

• Comprehensive ONSITE warranty 05 years

• Prices for different models to be quoted separately in tabular form.

**Optional:** to be quoted separately

- Freeze drying ampoules and vials of 2 to 5 ml capacity
- Data interface RS232 port for process documentation with PC of latest configuration must be provided for installation of process documentation software.

**Item Code: 18**

**TECHNICAL SPECIFICATION FOR ULTRACENTRIFUGE**

- Max. Speed: 1000,000 rpm or more
- Max. RCF: 800,000g or more
- Refrigerated: Yes
- Ambient Temperature Operating Range: 0°C to 40°C ± 0.5°C
- Temperature Display: Actual rotor temperature in 0.1°C increments
- Amperage: 16/20 A
- Control Speed Accuracy: ±2rpm
- Heat Output: 1kW or below
- Dimension: Specify
- Noise Level: 51dBA (running at set speed, under in-house test condition) measured 1m in front of instrument
- Refrigerator System Type: Thermo-module cooling system (CFC/HCFC/HFC-free Solid-state thermoelectric refrigerator (CFC-free)
• Vacuum system: Moisture purging /Moisture removal system
• Capacity: 6 X 250 mL
• Phase: Single
• Accel/Decel Profiles: 10/10 or more
• Large touch screen display with adjustable positions
• System should come with colour large LCD touchscreen operation for RPM/RCF/ Temp. /Time (Run/Hold) /Vacuum display with error alarm
• Should be able to handle volume starting from small such as 2mL to approx. 250mL/tube
• System should be able to accept Fixed angle / Vertical / Near vertical rotors and tube &Swinging Bucket rotors
• Convenient rotor catalogue and rotor tracking by serial number
• Simulation software feature which can provide sedimentation Coefficient & Protocol Optimisation before the experiment run
• Optional- HEPA filter for Bio safety compliance
• Drive Type: Imbalance tolerant drive with adjustable positions
• Electrical Requirements: 208 to 240 V 50/60 Hz
• Type: Floor Model Centrifuge
• Program Storage: 1000 programs with step-runs
• Certifications/Compliance: CE and cCSAus
• Warranty/Guarantee should be mentioned for system
• Warranty/Guarantee should be mentioned for drive
• Warranty/Guarantee should be mentioned for rotor
• Optional: Recommended voltage stabilizer (Servo)-10kVA

Rotor specification:
1. **Fixed Angle Titanium Rotor:**
   i. Rotor Capacity: 8 X 6mL or more with 800,000xg or 100,000rpm
   ii. Rotor k-factor: 15 or less
   iii. Sealable Pollyallomer tube of 2ml capacity should be able to run at 800,000 x g or more. Should include-300nos.
   iv. Sealable Pollyallomer tube of 6ml capacity should be able to run at 800,000 x g or more. Should include-300nos.

2. **Swing Out Titanium Rotor:**
   i. Rotor capacity: 6X5 mL or more with 368,000 x g or 55,000rpm
   ii. Rotor k-factor: 50 or less
   iii. Sealable Pollyallomer tube of 2ml capacity should be able to run at 368,000 x g or more. Should include-200nos.
   iv. Ultra-clear tube of 5mL capacity should be able to run at 368,000 x g or more. Should include-100nos.
   v. Sealable Pollyallomer tube of 0.8ml capacity should be able to run at 269,000 x g or more. Should include-100nos.

3. **Fixed Angle Titanium Rotor:**
   i. Rotor capacity: 6 X 94 mL or more with 235,000 x g or 45,000 rpm
   ii. Rotor k-factor: 135 or less
   iii. Pollycarbonate Bottle Assembly of 70mL capacity which should be able to run at 235,000 x g or more. Should include-30nos
   iv. Thin wall Pollyallomer tube of 94mL capacity should be able to run at 235,000 x g or more. Should include-200nos

4. **Other Essential Features:**
   i. Drive Cooling: Air-cooled
ii. Adaptors to accommodate small volume samples without sacrificing the maximum g force of the rotor
iii. Ability to remove moisture with vacuum
iv. A solid-state thermopile shall monitor the chamber temperature
v. Advanced Software features:
   ➢ Expert software with inbuilt calculations, simulations and references
   ➢ Real-time run graphing
   ➢ Powerful on-board simulation and calculation tool

• Vendor should have training and application lab in India for after sales support
• Suitable 10kVA servo stabilizer should be provided
• Prices should be quoted FOR destination Utkal university

Item Code: 19
DG SET (DIESEL GENERATOR) 125 KVA
• Six No. of cylinders & Configuration
• Bore x Stroke (mm) and displacement (L) of engine to be specified Liquid cooled
• self-starting- 12/24 V
• Engine KW/ HP to be specified
• Current in Ampere
• Manual / Electronic governor
• Turbo charged diesel engine 155 HP or required HP directly coupled to 125 KVA to be specified.
• 3phase
• brushless alternator (Volt to be specified) with manual control panel/ auto mains failure panel
• Fuel tank complete set mounted in acoustic enclosure as per Central pollution control board guidelines
• Fuel consumption L/h, BHP, Battery in AH, core cable requirements to be specified in (sq.mm)
• Lube oil and coolant capacity
• Dimension L x W x H in MM to be specified
• ENGINE Make and merits in fuel efficiency, delivery, Longevity
• Quality Certifications to be complied in support
• Installations list in last one year to reputed institutes/ organizations be complied with certificate in support
• Comprehensive warranty of 05 years with minor and major breakdown repair including labour service and spare.

Installation Specifications
• P.C.C. Civil foundation
• G.I. earthing as per requirement
• Core cable requirement: required specific core aluminium armoured cable of 50mtrs length (for extra cabling above 50 meters charges be quoted extra @ per meter)
• G.I sheet shed size be provided as per the dimension of DG set.
• Change over switch
• Unloading & shifting of DG at site- Installing and successful commissioning.
• Fuel required for trial run of the D.G.
• Provision of Grills with locking facility for safety
• Testing & compatibility of DG Set with running of the associated motors/ pumps/ Instruments/ equipment wherever installed and commissioned and a report to be submitted.

**Item Code: 20**

**DG SET (DIESEL GENERATOR) 250 KVA**

- Six No. of cylinders & Configuration
- Bore x Stroke (mm) and displacement (L) of engine to be specified.
- Liquid cooled
- self-starting- 24 V
- Turbo charged diesel Engine HP: 300-310 (250kVA) directly coupled to 250 KVA
- Current in Ampere [345-350 (250kVA)]
- Manual/ Electronic governor
- 3phase, 415±5 V
- Brushless alternator (Volt to be specified) with manual control panel / auto mains failure panel
- Fuel tank complete set mounted in acoustic enclosure as per Central pollution control board guidelines
- Fuel consumption L/h, BHP, Battery in AH, core cable requirements to be specified in (sq.mm)
- Lube oil and coolant capacity
- Dimension L x W x H in MM to be specified
- ENGINE Make& Model and merits in fuel efficiency, delivery, Longevity
- Quality Certifications to be complied in support
- Installations list in last one year to reputed institutes/ organizations be complied with certificate in support
- Comprehensive warranty of 05 years with minor and major breakdown repair & maintenance including labour service and spare.

**Installation Specifications**

- P.C.C. Civil foundation
- G.I. earthing as per requirement
- Core cable requirement: required specific core aluminium armoured cable of 50 mtrs length (for extra cabling above 50 meters charges be quoted extra @ per meter)
- G.I sheet shed size be provided as per the dimension of DG set.
- Change over switch
- Unloading & shifting of DG at site- Installing and successful commissioning.
- Fuel required for trial run of the D.G.
- Provision of Grills with locking facility for safety
- Testing & compatibility of DG Set with running of the associated motors/ pumps/ Instruments/ equipment wherever installed and commissioned and a report to be submitted.

**Item Code: 21**

**DG SET (DIESEL GENERATOR) 320 KVA**

- Six No. of cylinders & Configuration
- Bore x Stroke (mm) and displacement (L) of engine to be specified.
- Liquid cooled
- self-starting- 24 V
- Turbo charged diesel Engine HP: 385-395 (320kVA)] directly coupled to 320 KVA
• Current in Ampere [440-450 (320kVA)]
• Manual/ Electronic governor
• 3phase, 415±5 V
• Brushless alternator (Volt to be specified) with manual control panel / auto mains failure panel
• Fuel tank complete set mounted in acoustic enclosure as per Central pollution control board guidelines
• Fuel consumption L/h, BHP, Battery in AH, core cable requirements to be specified in (sq.mm)
• Lube oil and coolant capacity
• Dimension L x W x H in MM to be specified
• ENGINE Make & Model and merits in fuel efficiency, delivery, Longevity
• Quality Certifications to be complied in support
• Installations list in last one year to reputed institutes/ organizations be complied with certificate in support
• Comprehensive warranty of 05 years with minor and major breakdown repair & maintenance including labour service and spare.

Installation Specifications
• P.C.C. Civil foundation
• G.I. earthing as per requirement
• Core cable requirement: required specific core aluminium armoured cable of 50 mtrs length (for extra cabling above 50 meters charges be quoted extra @ per meter)
• G.I sheet shed size be provided as per the dimension of DG set.
• Change over switch
• Unloading & shifting of DG at site- Installing and successful commissioning.
• Fuel required for trial run of the D.G.
• Provision of Grills with locking facility for safety
• Testing & compatibility of DG Set with running of the associated motors/ pumps/ Instruments/ equipment wherever installed and commissioned and a report to be submitted.

Item Code: 22
CHEMIDOC SYSTEM WITH MULTIPLEX CAPABILITY
1. System with true16 bit CCD (not A/D) camera; pixel density of 65,536 gray levels.
2. Individual pixel size should be at least 4.54 x 4.54 µm or bigger.
3. Camera resolution should be more than 6 megapixels.
4. The system should have dynamic flat fielding technology.
5. The instrument should provide excellent quantitative data from a single blot having very intense and weak signals in a single image; to facilitate the same instrument’s dynamic range should be at least 4 orders of magnitude for all applications (please support with relevant technical data)
6. Instrument should provide highest level for sensitivity and hence must have minimal dark current with maximum limit of 0.002 e/p/s and low read noise of not more than 6e-.
7. The system should be supply with a 10% strain free solution.
8. The camera should have peltier based cooling.
9. Quantum efficiency at 425 nm should be 70% or more, this will ensure that the instrument is highly sensitive to very faint signals from chemiluminescent blots.
10. Motorized zoom fast lens with f/0.95 or better should be provided.
11. Light sources/excitation should include – Trans-UV (302 nm), Epi White, trans-white (requires White sample tray).
12. Instrument should have provision for protective UV shield for use during band excision with safety interlocks to avoid un-intentional UV exposure to the user.
13. Minimum imaging area for white light and chemiluminescence application should be 20.5 cm x 16.5 cm.
14. Sample drawers with fixed stage.
15. Should provide image acquisition with automatic zoom, focus, and iris adjustment without the need for users to focus or adjust aperture settings.
16. The instrument should have onboard attached touchscreen of 12” or bigger with multi-touch capability (2 points) enabling users to easily interact with the touchscreen to acquire, assess and export images. Touchscreen actions should include – tap, double tap, pan, scroll to zoom.
17. Instrument should have multiple input/output ports with minimum 3 USB ports allowing users to connect USB devices (like keyboard, mouse, data storage, and printer). One USB port should be provided on the front panel for easy export to USB. Also, system should have one Ethernet port so that users can transfer image files via Ethernet to networked computers.
18. Factory calibrated flat fielding for ensuring uniform data for all applications. System should be calibrated for image area, focus, and flat field correction at the factory and files stored in the integrated PC.
19. Users should be able lock the system to prevent others from interrupting/changing the settings
20. The system should have the below illumination sources:
   - Trans-UV, 302 nm (standard)
   - Epi-white (standard)
   - Trans-white (standard)
   - Trans-blue, 450-490 nm ((standard)
   - Epi-blue, 460-490 nm excitation (standard)
   - Epi-green, 520-545 nm excitation (standard)
   - Epi-red, 625-650 nm excitation (standard)
   - Epi-far red, 650-675 nm excitation (standard)
   - Epi-near IR, 755-777 nm excitation (standard)
21. System should be supplied with a stain-free acrylamide solution kit to enable stain-free imaging of gels and blots.
22. The system should have a fixed sample stage.
23. The system should provide flexibility in selecting the pixel binning options, should be possible to select minimally 2x2, 4x4 and 8x8 binning.
24. At least five prior installation report of the exact same model of the instrument in different universities/ institutes/ companies in India is required (should be provided with proper documentation from corresponding authority).
25. Should be supplied with a suitable Online UPS & PC

**Item Code: 23**

**ICE FLAKING MACHINE**

- Production capacity up to 120 kg of ice flake production per day
- Storage capacity up to 27 kg (55 lb) built-in ice storage
- Electronically controlled operation, with Self diagnostic functions with external alarm lights
- Should prove operational information for early alert and fast diagnosis of operating issues
  - Modular Flake-ice machine, production up to 120 kg in 24 hours.
  - Stainless steel “scotch-brite” finish; rounded corners for enhanced aesthetics and ergonomics;
• top cover: ABS plastic.
• Removable side panels on all four sides to aid routine maintenance and servicing.
• Sturdy evaporator in stainless steel AISI304, auger in AISI430.
• State of the art ice Breaker in special alloy.
• Reduced-maintenance, self-lubricating gear-reducer.
• hermetic compressor.
• Electronic control board with self-diagnostic and malfunction alarms.
• Produces Flake Ice, extruded at a temperature just below 0°C, contains 25% residual water content,
• CFC-free R 134a Refrigerant
  Certification: DVE, CE, WRAS, EAC, GS ETC.
  Compressor capacity: 4090 BTU/H, 500 WATT
  Dimensions (mm): W 564 mm D 536 mm H 531 Head only
  Weight:64 kg
  Voltage Options:230/50/1
  Load (watts):500
  5 years warranty

Item Code: 24
WALK-IN-COLD ROOM

<table>
<thead>
<tr>
<th>Description</th>
<th>Cold Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Room Size in Ft (External)</td>
<td>10’ L x 8’ W x 8’(H)</td>
</tr>
<tr>
<td>Room Temperature</td>
<td>2 to 8 ºC</td>
</tr>
<tr>
<td>Ambient Temperature Considered</td>
<td>38 to 45 ºC</td>
</tr>
<tr>
<td>Wall and Ceiling Insulation</td>
<td>55=60 mm PUF Panel, complete with all accessories to make the Chiller Room</td>
</tr>
<tr>
<td>Floor Insulation</td>
<td>PCC, with aluminium chequered flooring.</td>
</tr>
<tr>
<td>Door Size</td>
<td>78” x 34” x 60 mm thk - 1 Nos.</td>
</tr>
<tr>
<td>Refrigeration Unit</td>
<td>1 no of 10000 BTU/hr Capacity (2.93 Kw approx)</td>
</tr>
<tr>
<td>Power consumption</td>
<td>V/PH/Hz – 220/1/150</td>
</tr>
<tr>
<td>PANEL:</td>
<td>CFC Free Foamed In-place (PUF)</td>
</tr>
<tr>
<td>Insulation</td>
<td>Co-efficient of Heat Transfer, Density, K-value of Insulation, Thermal conductivity, Compressive strength, Adhesion strength (PUF to steel), Closed Cell contents, Fire resistance, Water absorption, Vapour permeability to be specified</td>
</tr>
<tr>
<td>Thickness of outer sheets</td>
<td>24 Gauge</td>
</tr>
<tr>
<td>Material of outer sheets</td>
<td>Pre-painted GI</td>
</tr>
<tr>
<td>Metallic lock, provided with Ozone friendly R-141 blown foam (Kgs/Cubic Mtr), Wall to prevent bacterial growth</td>
<td></td>
</tr>
<tr>
<td>Type of sealant</td>
<td>Gasket/silicone</td>
</tr>
<tr>
<td>Panel joints- With double vinyl gasket &amp; metallic Cam Lock to make leak proof joints. anti-dampness provision in floor and joints to hold wall</td>
<td></td>
</tr>
<tr>
<td>DOOR:</td>
<td>78” x 34” X 60 mm with PUF insulation</td>
</tr>
</tbody>
</table>
Other Features: Hydraulic Door Closure, Positive Cam Lift Hardware, Vinyl gasket on all sides & ensure leak and dampness, with SS brackets Safety Release Exit Device for opening door from inside

| Installation of Indoor Evaporating Unit and Outdoor Condensing Unit |
| Copper piping and electrical cabling between IDU and ODU, Suction Line Insulation, Drain Piping etc. |
| Pressure Testing with Nitrogen, Vacuumising, Charging of R22 refrigerant and commissioning the system. |
| Comprehensive warranty 05 yrs |

**Item Code: 25**

**DEEP FREEZER MINUS 20 DEGREE C**
- Capacity- 344 Litres,
- Width-23 inches, Depth- 23 inches, Hight-73 inches,
- Temp. range- 17C to -20 deg C, With Locking Facility
- Defrost –Manually,
- No of Baskets/Shelves-8, No of Door-1

**Item Code: 26**

**DEEP FREEZER MINUS 80 DEGREE C**
1. Vertical type Ultra Low Temperature Freezer, Temp Range -50 deg C to –80 Deg C
2. Capacity must be 540 - 550 Litre.
3. System should have incorporated H-Drive Information Centre (HIC)
4. Freezer must have incorporated set point security.
5. Freezer interface should be incorporate icons to advice users of alarm status for warm or cold excursions, door ajar, or power failure, to communicate service warnings, health status icon.
6. Freezer interface should have warm alarm test function
7. System should have record temperature excursions including actual temperature, warmest temperature and coldest temperature
8. Freezer must recognize if line voltage and frequency does not match freezer specification and alert user.
9. Empty freezer shall recover from door opening to -75°C set point in under 25 minutes. Supplier must provide test data verify freezer performance.
10. Empty freezer should not warm to -50°C from -80°C set point in under 290 minutes during a power failure in a 20°C room
11. System maintain a sound level under than: 50dB(A)
12. Refrigeration system: Freezer must be use only Natural, commercially available Refrigerants (Hydrocarbon) with no special blends required.
13. Refrigeration system shall contain a liquid line/suction line heat exchanger to ensure freezer temperature stability.
14. Freezer refrigeration system shall incorporate a brazed plate heat exchanger. Heat exchanger shall be placed in a thermal box in the deck of the freezer to optimize freezer storage capacity
15. Freezer must be built to and contain the registration mark for UL, cUL, and CE International Standards for Safety and Performance.
16. The freezer must be constructed using 1” thick Vacuum Panel Insulation in conjunction with Environmentally-Friendly Water Blown Foam
17. Door gasket must provide 7 independent insulation zones along with 4 points of contact to ensure sample security
18. Freezer shall be painted with high-impact, scratch resistant powder coat finished interior and exterior to ensure long term viability and enhanced temperature uniformity.
19. To reduce condensation, the perimeter heater shall be on the door side not on the cabinet side to limit heat introduction into the sample storage area.
20. Freezer shall have 4 internal storage compartments with a minimum of 4 polystyrene insulated inner doors to ensure sample security. Inner doors should have no latches or external magnets and must be removable for easy cleaning without the use of tools.
21. Freezer should have an automatic heated pressure equalization port which allows for rapid re-entry to cabinet.
22. Freezer should have two-1-inch access ports as standard.
23. Freezer should have a RS485 output, dry contacts and 4-20mA output for remote monitoring purposes.
24. Freezer door must open at least 180 degrees for easy sample access.
25. Freezer must have capability of being cloud connected for remote system monitoring.
26. Suitable 5 KVA Servo Voltage stabilizer should be provided.
27. Should be quoted with suitable Stain less steel self-manufacturing sliding drawer (minimum 4) with box (minimum 100).
28. Prompt and efficient after sales should be available.
29. CO₂ Back-up system. CO₂ cylinder with tube valve to be offered for operation of CO₂ back-up system.
30. Warranty: Must be 5 years from factory on overall instrument.

**Item Code: 27**
FREEZER 4 DEGREE C
1. Capacity (in litres)- 310 L
2. Power Source-Electric
3. Body Material-Metal
4. Temperature Range- 0 to 8 degrees C
5. Refrigerant-Ammonia
6. Freezer Door-Solid
7. Door No.-2
8. Number of Shelves-4
10. Warranty- 5 years

**Item Code: 28**
BOD INCUBATOR
A BOD Cooling Incubators
B.O.D. test, storage of sensitive cultures, vaccines etc. culture of bacteria microorganism and plant life, serum incubation studies and Immunological work etc.
Temperature range 5°C to 60°C
Internal Volume (Liters) 370
Number of trays 4
Hermetically sealed Compressor with CFC free refrigerant
Internal Dimensions W x D x H (cm): 66 x 65 x 85 approx
External Dimensions W x D x H (cm): 80x 110x150 approx
Temperature control Microprocessor with PT-100 sensor, Display 1”-7 Segment, LED, Power Failure & Door Open Audio-Visual Alarm,
Temperature Variation Alarm Set Temperature + 2°C, Audio Visual Alarm Illumination: 8 Watts Fluorescent Tube
Internal Body Material Stainless Steel - 304 grade (Standard Models)/ Stainless Steel - 316 grade (GMP Models)
External Body Material Powder Coated CRCA Steel (Standard Models)/ Stainless Steel - 304 grade (GMP Models)
Insulation 70 mm minimum for Body & 80 mm for Door, CFC free polyurethane foam
Noise Level Less Than 65 db(A)
Recommended Servo Voltage Stabilizer vs-02

These Chambers are constructed of double walls, the exterior is made of sheet steel while the inner chamber is made of stainless steel made up of Plexiglass inner door.

**B ORBITAL SHAKER INCUBATORS**

Temperature controlled with shaker used in fermentations studies, enzyme reactions, Plant tissue culture and Biotechnology.

Induction Motor with variable frequency drive suitable for continuous operations, Step less variable frequency drive, Counter balanced mechanism

Temperature Range & Accuracy: 5°C above ambient to GO°C, + 0.5°C

Internal Volume (Liters): 215-220

Platform Size (cm) 58 x 60cm

Maximum Shaking Capacity: 100ml x 49, 250m! x 33, 500m! x 24,

Shaking Speed range (RPM) 20 to 250, Amplitude 25 mm

Internal Dimensions W x D x H (cm) 65 x 75 x 65(approx)

External Dimensions W x D x H (cm) 80x 115 x 130 (approx)

Temperature control Microprocessor with PT-100 sensor, Display 4” LCD Screen, Power Failure, Door Open & Temperature Variation Alarm (+ 2°C) Audio Visual Alarm

Illumination: 8 Watts Fluorescent Tube

Internal Body Material Stainless Steel - 3816 grade (GMP Models)

External Body Material Stainless Steel - 304 grade (GMP Models)

Insulation (CFC free polyurethane foam) 70 mm - Body & 80 mm-Door

Noise Level Less Than 65 db (A)

Recommended Voltage servo Stabilizer VS-02


Clamps to hold the flask

**Item Code: 29**

**UV-VIS SPECTROPHOTOMETER**

**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).
- **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

**Item Code: 30**

**UV-VIS SPECTROPHOTOMETER WITH MICROVOLUME CAPACITY**

**Main System**: UV-Vis Spectrophotometer with PC, Printer, and Analysis solution software
- Equipment capable of measuring sample in microvolume range.
- 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).
- **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

**Item Code: 31**

**UV-VIS SPECTROPHOTOMETER WITH DIFFUSE REFLECTANCE**

**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.

**Essential accessories**
• Reflectance Accessory: Diffuse reflectance attachment for solid sample spectral studies in the range of 250 to 1100 nm or better
• Barium sulphate (if required): 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

Item Code: 32
TEMPERATURE CONTROLLED OVEN (PROGRAMMABLE)
• Capacity: Approx. 60 lit/2.1 cft
• Temperature range: Ambient to 250°C
• Temperature Uniformity: ±1°C
• Internal Chamber Dimension: WxHxD (in cm) = 40x42x36 (Approx)
• Exterior Dimension: WxHxD (in cm) = 58x76x64 (Approx)
• Temperature ramp: Variable (preferable 15 min for 100°C
• Programmable temperature controller with provision for multistage heating
• Temperature Display: LED
• Number of Shelves/Shelves position: 02 / 08
• Power: 230 V (AC); 50/60 Hz
• Construction: Stainless steel interior, powder-coated exterior
• The oven should fit with timer with range 1 min to 99 hrs.

Essential Accessories
• Teflon lined autoclave reactor (Capacity: 25/30 ml, 50/60 ml, 100 ml, 4 Each

Item Code: 33
PHOTOCATALYTIC REACTOR WITH ACCESSORIES
Reactor
• Double walled outer jacket with inlet/outlet for water circulation with desired standard joint. Made of both Quartz and glass (quote price separately)
• Inner immersion well (quartz) to hold the lamp, Quartz Glass Transparency: 99% UU Pass
• Capacity: 500 to 1000 ml with Immersion Reactor (Working Volume 100 – 250 ml) or more.
• 3 ports for liquid/solid input/output
• Proper leak proof sealing (if required)
• Lamps: High and medium pressure mercury lamp for visible and UV light (Literature of spectral range of output light is to be provided) with outer quartz shield for passing ~ 99% light.
• Power supply units (for lamps) if required.
• Voltage stabilizer (if required)

Reactor Accessories:
• Safety cabinet design for UV light protection and safety measures.
• Temperature display.
• Digital Magnetic stirrer (Max stirring volume: 1000 ml; speed: Variable with maximum up to 1500 rpm; Power: 220V/50Hz

Temperature Controlled Unit
• External or Inbuilt cooling water circulations system with pump for maintaining the temperature of the reactor during reaction
**Item Code: 34**

**SOLAR SIMULATOR**

Solar simulator: Specification

- Class AAA
- Standard: ASTM or JIS or IEC standard for spectral matching, Non-uniformity, and temporal instability
- Illumination Lamp/Area: LED/At least 9 cm² or above with good lamp life
- Power Output: 100 m W/cm² (1.0 sun equivalent)
- Spectral Range: 400 nm to 1100 nm
- Temporal Instability: < 0.2%
- Electrical Input Voltage: 90 – 240 V AC, 50/60 Hz
- The system should have all essential accessories to carry out different photoreactions
- Attachment for I-V measurement and Quantum efficiency facility (optional)

**Extra features**

- Temperature indicator, Height adjustable cell holder, reference cell, reactor cell, electrical cable, photocatalysis set up

**Warranty:** 5 years

**Optional:** Up gradation provision to higher wavelength

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**Item Code: 35**

**HIGH SPEED COOLING CENTRIFUGE**

- Max. Speed: 30,000rpm or above
- Max. RCF (xg): 110,000 or above
- Max. Volume: 4 liters
- Set Speed control accuracy: ±10rpm of set temp.
- Set Temp.: -20°C to 40°C in 1°C increment
- Ambient Operating range: 15°C to 40°C
- Over Temperature shutdown point: 45°C or better
- Acceleration Profiles: 10
- Deceleration Profiles: 10
- Set Time: up to 99 hrs 59 mins
- Model: Floor model
- User-Defined Programs: 1000 with up to 30 steps each
- User Profiles: 50 unique users and passwords
- Large touch screen display with adjustable positions (swivel and tilt)
- The rotor chamber shall be made of stainless steel to resist corrosion. A rubber gasket around the chamber opening ensuring sealing

**Rotors Specification:**

- **Aluminium Rotor: Fixed angle:**
  - i. Rotor Max. Capacity: 3 liters (6X500ml) and more
  - ii. Rotor Max. Speed: 9000 rpm or more
  - iii. Rotor max. Force: 16,000 xg and more
  - iv. Rotor Material: Aluminium

- **Aluminium Rotor: Fixed angle:**
  - i. Rotor Max. Capacity: 8 X 50ml or above
  - ii. Rotor Max. Speed: 24,000rpm or more
  - iii. Rotor max. Force: 70,000 x g or more
  - iv. Adapter: 16 x 1.5ml
➢ **Swing Out Rotor with aluminium Bucket:**
  i. Max. Volume: 4 X 500ml (2000ml)
  ii. Rotor Max. Speed: 5000 rpm or more
  iii. Rotor max. Force: 6870 xg or more

➢ **15ml tube adapter should be included which can accommodate any SBS standard round bottom tubes available in the market**

➢ **Polypropylene snap cap 1.5ml tubes and required adaptors should be included which can run at 70,000 x g or more. Include 1000 nos of 1.5ml tubes**

➢ **200 nos of 50ml polycarbonate tubes with snap caps should include which can run 80,000 x g or more**

**Specific Centrifuge Requirements:**

➢ Electronic Signature: Yes

➢ The system shall have inbuilt mechanism to reach desired vacuum levels much faster

➢ An over temperature system shall provide flexibility, sample protection and safety for user

➢ Rotor Tracking: By serial number

➢ Drive: Brushless, high-torque, switched reluctance motor

➢ Drive Cooling: Air-cooled

➢ Maximum Heat Dissipation: 5120Btu/h (1.5kW)

➢ Noise level 1 meter in front of centrifuge: 70dBA or better

➢ Refrigeration System: Refrigerant 404A (HVC)

➢ Power tolerance range: 190 to 250 VAC or better

➢ Humidity restrictions: <80% (non-condensing)

➢ Shall give audible sounds for Boot up/ Start of Run/ End of Run, Diagnostics/ Alert, Vacuum low enough to open door

**Safety Requirements:**

➢ An electromechanical door lock system prevents operator contact with spinning rotors and prevents run initiation unless the door is closed and locked

➢ An imbalance detector shall monitor the rotor during the run, causing automatic shutdown if rotor loads are severely out of balance

➢ Shall have an inbuilt mechanism to calculate rotor inertial energy and stops the system to prevent rotor failures

**Item Code: 36**

**SURFACE AREA AND POROSITY ANALYSER**

**Automatic BET Analyser for Physisorption and Chemisorption: Specification**

- Fully automatic, high resolution gas sorption analyser for the determination surface area, mesopore size and micropore distributions from 0.35 to 500nm is required for high throughput micropore BET Measurements
- The system should handle all types of sample in powder, pellet & monolith forms.
- System should be compatible for CO2 analysis.

**Key features:**

- Capable of performing complete Chemisorption analysis for TPR, TPO, TPD job (preferably) in the same system.
- Continuous Po measurement using a dedicated cell and transducer without interruption to the analysis.
- Fully integrated, built-in/external vacuum system using an oil-free turbo pump package.
- Four or more dedicated degassing stations with access to turbo vacuum via cold-trap.
• Able to use any non-corrosive gas such as nitrogen, argon, krypton, carbon dioxide, hydrogen, carbon monoxide, butane, etc.
• Physisorption and chemisorption analysis stations.
• Capable to use CO\textsubscript{2} as the adsorbate and all related accessories (water level sensor, thermostatic sample cell holder, recirculatory) are to be quoted

**Measurement criteria:**

a) Surface area: BET, Langmuir, t-plot, BJH/DH, DR, DFT  
b) Mesopore size: NLDFT, BJH/DH, Kr thin film  
c) Micropore Size: NLDFT, QSDFT, SF, HK, MP method, DA, Monte Carlo  
d) Pore Volume: Gurvich, α-s, BJH/DH, DFT, DR  
e) Adsorption energy: Clausius-Clapeyron, DR  
f) Fractals: FHH, NK  
g) Chemisorption: Clausius-Clapeyron  
h) Catalyst parameters: Active (metal) area, dispersion, crystallite size  

**Basic Measurement Specifications:**

a) Surface area using nitrogen: 0.01 m\textsuperscript{2}/g and above  
b) Sensitivity: <2 x 10\textsuperscript{-8} moles adsorbed/desorbed gas with 1 torrtransducer  
c) Maximum P/Po using nitrogen/argon: 0.999  
d) Ultimate vacuum: 5x10\textsuperscript{-8} mbar

**Pressure Specifications of the Analyzer:**

• Accuracy 1 to 1000 torr range: ~ ± 0.15% or better  
• Resolution, 1 to 1000 torr range: 6 x 10\textsuperscript{-5} torr to 6 x 10\textsuperscript{-8} torr  
• E. Minimum and max. P/Po using nitrogen/argon: <1 x 10\textsuperscript{-7} - 0.999  
• Ultimate vacuum: ~ 5x10\textsuperscript{-10} mbar

**Analysis Features:**

a. A High-vacuum construction using metal-to-metal seals is expected for long life performance  
b. Small void volumes  
c. Provision to constantly monitor measurement of temperature and pressure.  
d. Multiple dosing modes using a target P/Po or fixed volumes in multiple ranges.  
e. A dosing intelligence feature to use prior analysis as template for dosing in subsequent runs.  
f. Measurement void volume automatically or re-use value already measured  
g. Measurement of saturation pressure constantly or user entered.  
h. At least 3 litre or larger Dewar to extend uninterrupted analysis time to 72+ hours without refill.  
i. Provision of automatic selection of analysis gas from 3-5 inputs

**Degassing Features:**

a. Degassing with program for multiple heating ramps and hold times  
b. System with automatic backfill from dedicated gas input or isolate under vacuum at end of degassing.  
c. Vacuum path should have refillable cold trap for best degas vacuum levels.  
d. Heating mantles with dual, independent thermocouples for over-temperature safety.  
e. Heating mantles to be supported by retractable tethers to eliminate hot metal clips for ease of use.
f. Max. temp of Heating mantle ~ 350º C.

Chemisorption features:
   a. Max. Furnace temperature1000°C or better; Accuracy: ~ 0.1%; Ramp: 1 to 50°C/min.
   b. Furnace with rapid cooling provision without using utility air; dual thermocouples; automatic furnace lid placement/removal facility
   c. W/Re TCD filament or equivalent and robust for all applications.
   d. Software including peak deconvolution for quantitative analysis.

Power requirement: 200-240 V, 50Hz, single phase power supply.

Essential Accessories to be supplied along with the system:
   a. Compatible desktop computer (minimum i5 configuration) and b/w laser printer
   b. Sample cells (in different capacities): 5 each for powders, pellets and granules.
   c. “O” rings & filler rods (10 sets and 4 sets, respectively).
   d. Suitable standards for micropore/mesopore range
   e. Gas cylinders (filled with ultra-purity gases, 99.999%) with two stage SS gas regulators.
      Nitrogen (two cylinders); Helium, and carbon dioxide,
   f. Gas cylinders (filled with ultra-purity gases, 99.999%) with two stage SS gas regulators.
      Hydrogen and Carbon monoxide gases (one each) (Optional).
   g. Liquid Nitrogen Container (capacity 10 Lit): 2 Nos.

Warranty: 5 years comprehensive warranty on whole system. Installation and users’ details of similar system in India are to be provided

Item Code: 37

PARTICLE SIZE AND ZETA POTENTIAL ANALYZER
Single Proven system for Nano Particle Size, Zeta Potential and Molecular Weight system at variable temperature (0 – 90 ± 0.1 °C) or more 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 Invasive Back Scattering detection technique, Multi or mono angle, 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

<table>
<thead>
<tr>
<th>Zeta potential measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
</tr>
<tr>
<td>Size Range</td>
</tr>
<tr>
<td>Sample Concentration</td>
</tr>
<tr>
<td>Sample conductivity</td>
</tr>
<tr>
<td>Minimum sample volume</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Particle size analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
</tr>
<tr>
<td>Minimum sample volume</td>
</tr>
<tr>
<td>Measurement provision</td>
</tr>
<tr>
<td>Sample Concentration</td>
</tr>
<tr>
<td>Necessary cuvettes for Size measurement</td>
</tr>
</tbody>
</table>
### Molecular weight determination

Should have facility to measure MW using the backscatter angle (for small sized samples such as <3nm) and Debye plot with a Range of molecular weight – around 500Da to 2 x 10^6 Da or better.

Also, the same measurement should be able to determine the Kd and A2 to understand the solute-solute and solute-solvent interactions.

<table>
<thead>
<tr>
<th>Laser</th>
<th>Laser Power: 4m W or less with auto attenuation feature for higher sensitivity of the instrument. (As per ISO 13321)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Purging</td>
<td>Dry Air or nitrogen purging facility to avoid condensation.</td>
</tr>
<tr>
<td>Optics</td>
<td>Fixed Optics with automatic alignment prior to measurement.</td>
</tr>
<tr>
<td>Sensitivity (Toluene Count)</td>
<td>Very good sensitivity. Mention the value with reference to Toluene count/photon count.</td>
</tr>
<tr>
<td>Correlator</td>
<td>The system should have Digital correlator minimum 25ns with up to 4000 channels.</td>
</tr>
<tr>
<td>Auto initialization</td>
<td>Automatic</td>
</tr>
<tr>
<td>Detector</td>
<td>Avalanche Photo Diode Detector or equivalent</td>
</tr>
</tbody>
</table>
| 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 – 1 no
- Low-volume quartz batch cuvette (12µl volume) for size measurement- 1 no |
| Measurement time | should be less than 10 -20 Sec or better |
| Standard | Ready to use Zeta potential Standard- 1 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 mentioned if any. |

### Other conditions

Vendors require to submit the following along with tender paper.

- Installation/Demonstration/Application Training at site:
- Comprehensive Warranty:
- User list:
- After sales Service particulars.

### Item Code: 38

**TURBIDITY METER**

**Specification**

- Type: Manual
- Source: Project Lamp
- Detector: Photodiode
- Range: 0-1000 NTU
- Display: 3.5 Digit LED
- Accuracy: ± 3% FSD 500 to 1000 NTU ±2% FSD 0-500NTU
- Calibration solution: Formazine standard solution
- Accessories: 4 test tube and Light shield
**Item Code: 39**

**VISIBLE SPECTRO-PHOTOMETER**

**Specification**
- Single beam visible spectrophotometer
- Type: Key board based
- Light source: Tungsten halogen lamp
- Detector: Solid state silicone photodiode
- Display: Dial based wavelength Display
- Measuring Mode: (a) Abs (b) %T (c) Conc. By K-factor
- Wave length range: 340 to 960 nm
- Spectral band width: 5 nm
- Wavelength Accuracy: ±5nm
- Absorbance range: -0.04 to 2.5 Abs
- Photometric resolution: 0.1%T, 0.001 Abs
- Photometric Accuracy: ±0.010 Abs at 1.00 Abs

**Item Code: 40**

**DGPS**

Technical Specification of RTK DGPS System and Combined Survey System

The detailed technical specification of the RTK DGPS Units and Combined Survey System are given below.

A. **RTG DGPS UNIT:**
   A.1. All the six (6) nos of RTK DGPS units should have capability of being used as both Base and Rover stations i.e. Base and Rover Receivers should be fully interchangeable.
   A.2. RTK DEPS Units should be able to stake the lines in Local Coordinate System (LCC etc) and WGS84.
   A.3. The detailed technical specification of each RTK DGPS unit is given in A.4

<table>
<thead>
<tr>
<th>Specification</th>
<th>A.4.1: Receiver</th>
<th>A.4.1.1: Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiver</td>
<td>Receiver should be based on the best available tracking technology in the market. It should be capable of tracking all available signal i.e. GPS (L1,L2, L2C &amp; future L5), GLOMANN and ready to track upcoming navigation systems i.e. GALILEO.</td>
<td></td>
</tr>
<tr>
<td>A.4.1.2: Technology</td>
<td>Fast Acquisition, High Signal to Noise Ratio, Excellent Tracking Efficiency (Even in adverse conditions), Inbuilt monitoring of ambiguities, Inbuilt multipath mitigation, Interference resistant.</td>
<td></td>
</tr>
<tr>
<td>A.4.1.3: Frequency</td>
<td>Multi-Frequency</td>
<td></td>
</tr>
<tr>
<td>A.4.1.4: Measuring Modes</td>
<td>Static, Rapid Static and Real Time Kinematic</td>
<td></td>
</tr>
<tr>
<td>A.4.1.5: Channels</td>
<td>72 Channels or More</td>
<td></td>
</tr>
<tr>
<td>A.4.1.6 : Time to first phase measurement</td>
<td>Typically 50 seconds or better.</td>
<td></td>
</tr>
<tr>
<td>A.4.1.7: Ports</td>
<td>Suitable and sufficient no of external/internal ports for data transfer, control, antenna and power supply.</td>
<td></td>
</tr>
<tr>
<td>A.4.1.8: Power Consumption</td>
<td>5W or less (Receiver+ Controller+ Antenna).</td>
<td></td>
</tr>
<tr>
<td>A.4.1.9: Weight</td>
<td>Should be Light in Weight (Less than 1.5 Kg).</td>
<td></td>
</tr>
<tr>
<td>A.4.1.10: Upgradeability</td>
<td>DGPS units must be upgradeable.</td>
<td></td>
</tr>
<tr>
<td>A.4.1.11: In static mode</td>
<td>Horizontal -5mm + 1 ppm or better</td>
<td></td>
</tr>
<tr>
<td>A.4.1.11: In RTK mode</td>
<td>Horizontal -10mm + 1 ppm or better</td>
<td></td>
</tr>
<tr>
<td>A.4.1.12: Reliability</td>
<td>Vertical -10mm + 1 ppm or better</td>
<td></td>
</tr>
<tr>
<td>A.4.1.12: Reliability</td>
<td>Vertical -20mm + 1 ppm or better</td>
<td></td>
</tr>
<tr>
<td>A.4.1.13: Position Update and latency</td>
<td>0.05 seconds (20 Hz) or better.</td>
<td></td>
</tr>
<tr>
<td>A.4.1.13: Position Update and latency</td>
<td>0.03 seconds or better</td>
<td></td>
</tr>
<tr>
<td>A.4.1.13: Position Update and latency</td>
<td>NMEA 0183 v2.3 or better</td>
<td></td>
</tr>
<tr>
<td>A.4.1.14: Recording Rate</td>
<td>Selectable up to 0.05 seconds, parallel data logging at two different logging rates in the same receiver.</td>
<td></td>
</tr>
<tr>
<td>A.4.1.14: Recording Rate</td>
<td>Compact Flash Cards/USB Devices of 256 MB or more (4 Nos. With each instrument)</td>
<td></td>
</tr>
<tr>
<td>A.4.1.14: Recording Rate</td>
<td>RTCM Versions 2.2/2.3/3.0/3.1, CMR, CMR+, and all other desirable data formats through 2 ports.</td>
<td></td>
</tr>
<tr>
<td>A.4.1.15: Power Supply</td>
<td>Two internal rechargeable Li-Ion batteries should be supplied with each receiver.</td>
<td></td>
</tr>
<tr>
<td>A.4.1.15: Power Supply</td>
<td>Two batteries should power Receiver, Controller and Antenna for 10 hours or more.</td>
<td></td>
</tr>
<tr>
<td>A.4.1.15: Power Supply</td>
<td>External chargers should be supplied with each receiver.</td>
<td></td>
</tr>
<tr>
<td>A.4.2: Antenna</td>
<td>One Light weight portable geodetic antenna should be offered with each RTK DGPS Unit. Antenna may be a separate unit or single modular unit with receiver.</td>
<td></td>
</tr>
<tr>
<td>A.4.3: Display Controller</td>
<td>One controller with Touch-Screen should be provided along with each RTK DGPS Unit.</td>
<td></td>
</tr>
<tr>
<td>A.4.3.1: Type</td>
<td>LCD/Quarter VGA display with coloured touch screen, complete graphics with active map for selection of features from Map View. Full display of map including points,</td>
<td></td>
</tr>
<tr>
<td>A.4.3.3: Keyboard</td>
<td>Complete QWERTY hard keyboard with separate numeric and alphanumeric keys. Function keys and user defined keys, illumination for screen and keys.</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>A.4.3.4: Weight</td>
<td>Controller should be light in weight</td>
<td></td>
</tr>
<tr>
<td>A.4.4: Environmental specifications for Receiver, Controller and Antenna</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.4.4.1: Operational Temp.</td>
<td>-20°C to + 65°C or better</td>
<td></td>
</tr>
<tr>
<td>A.4.4.2: Storage Temp.</td>
<td>-30°C to +75°C or better</td>
<td></td>
</tr>
<tr>
<td>A.4.4.3: Humidity</td>
<td>Up to 100%</td>
<td></td>
</tr>
<tr>
<td>A.4.4.4: Protection against water, dust and sand</td>
<td>Receiver, antennas and controllers must be waterproof to 1m temporary submersion and Dust Tight.</td>
<td></td>
</tr>
<tr>
<td>A.4.4.5: Shock/Drop onto hard surface</td>
<td>Receiver-withstands 1m drop onto hard surface. Antenna – withstands 1.5m drop onto hard surface.</td>
<td></td>
</tr>
<tr>
<td>A.4.5.: Onboard Software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.4.5.1: Graphics</td>
<td>One Onboard Software should be offered with each RTK DGPS Unit. Graphics representation of points, Lines and Areas. Application Result Plots. Back ground map. Topology sharing and multiple feature data collection must be possible in the controller in the field itself in real time.</td>
<td></td>
</tr>
<tr>
<td>A.4.5.2: Icons</td>
<td>Icons indicating the current status of measure modes, settings, battery etc.</td>
<td></td>
</tr>
<tr>
<td>A.4.5.3: Function Keys</td>
<td>Direct function Keys for quick and easy operation.</td>
<td></td>
</tr>
<tr>
<td>A.4.5.4: Configuration sets</td>
<td>Ability to store and transfer all instrument and application configuration settings for different operators, survey tasks.</td>
<td></td>
</tr>
<tr>
<td>A.4.5.5: Coding</td>
<td>Support for both Free and Thematic Coding with attribute. Should support quick coding too.</td>
<td></td>
</tr>
<tr>
<td>A.4.5.6: Onboard Programmes</td>
<td>Surveying, stacking, COGO, Area, Two Point Distance, Automatic Recording points with user defined time or distance, Hidden point Measurements.</td>
<td></td>
</tr>
<tr>
<td>A.4.5.7: Real Time Processing</td>
<td>Onboard software should be capable to process ambiguities in real time.</td>
<td></td>
</tr>
<tr>
<td>A.4.6: Radio Modem</td>
<td>One Radio Modem should be offered with each RTK DGPS Unit. Output power should be 25 watt or more at Base Station and 5 Watt or more at Rover station. Each base radio unit should equip with 10m. Antenna Mast., cable etc.</td>
<td></td>
</tr>
<tr>
<td>A.4.7:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.4.7.1: All the necessary cables</td>
<td>(2 set of connection cables with each RTK DGPS Unit).</td>
<td></td>
</tr>
<tr>
<td>A.4.7.2: Tribrach with optical plummet</td>
<td>Must be offered (2 sets with each RTK DGPS Unit).</td>
<td></td>
</tr>
<tr>
<td>A.4.7.3: Wooden Telescopic Tripod</td>
<td>Must be offered (2 nos for each RTK DGPS Unit).</td>
<td></td>
</tr>
<tr>
<td>A.4.7.4: Rechargeable internal batteries</td>
<td>Three no. per RTK DGPS Unit</td>
<td></td>
</tr>
</tbody>
</table>
### Accessories

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.4.7.5</td>
<td>All accessories for Rover to mount on pole and others accessories on backpack if too heavy (Aluminium pole for 2m elevation or more etc should be offered). In case, Receiver and Antenna are in a single modular design, pole for mounting all the accessories should be offered. These accessories must be offered in 2 nos for each RTK DGPS Unit.</td>
</tr>
<tr>
<td>A.4.7.6</td>
<td>One no. Of Quick charger must be offered with each battery.</td>
</tr>
<tr>
<td>A.4.7.7</td>
<td>All necessary accessories other that stated above need to be provided so that all the RTK DGPS Unit can function as either base or rover simultaneously.</td>
</tr>
</tbody>
</table>

The RTK DGPS Unit must be upgradeable.

**Item Code: 41**

**MULTIMODE PLATE-READER**

- Instrument should be able to read UV-Vis Absorbance, Fluorescence and Luminescence
- Should be capable of performing End-point, Kinetic, and Spectral Scanning and Well area scanning assays.
- It should be able to read 6, 12, 24, 48, 96, 384 well plates without need for any adapters. Also read Micro-volume (2µl) samples at least 16 samples at a time. Also, should be capable of measuring standard cuvettes.
- It should have Linear, Orbital and double shaking feature with temperature control from ambient +4°C to 45°C. Option for speed and duration should be programmable.
- Wavelength selection with Quadruple grating Monochromator (2 Excitation and 2 Emission Monochromators).
- Absorbance wavelength range should be selectable from 250 to 999nm selectable in 1nm increments. Fluorescence wavelength should be selectable from 250 to 700 nm selectable in 1nm increments.
- Light source should be Xenon Lamp having long life with at least 1 billion flashes
- Detector – Photodiode for Absorbance and PMT for Fluorescence and Luminescence
- Absorbance range should be from 0 to 4 OD with resolution of 0.0001 OD.
- Should have pathlength correction feature.
- It should have both Top and Bottom reading probes for Fluorescence measurements
- Fluorescence Sensitivity: Fluorescein 2.5 pM (0.25 fmol/well 384 well plate)
- It should be capable of performing glow Luminescence assay.
- Luminescence sensitivity: 20 amol ATP
- Reading speed – 96 wells –11 sec & 384 wells – in 22 sec
- Instrument should be CE and TUV Safety Agency marked and RoHS compliant
- Option for upgradeable on site to include Anisotropy integrated in the same unit for future needs. Also, should be able to on site add dual reagent dispenser for fast kinetics and flash fluorescence / Luminescence assays
- Suitable software to perform data analysis and data acquisition platform should be supplied
- 100-240 V AC 50/60 Hz .130 Watts max
- Make: USA
- Desktop must be supplied with this instrument
- Warranty 05 Years on Machine
Item Code: 42
ROTARY VACUUM EVAPORATOR
Component
• Heating Bath
• Vapor duct (with Combi-Clip)
• Vacuum seal compatible
• Evaporating flask (1 liter)
• Receiving flask (1 liter)
• Power cable (1 for heating bath, 1 for Rotavapor)
• Set of required cooling tubings
• Vacuum Box
• Communications cable

Evaporator specifications
• Dimensions (W x D x H) with glass apparatus mm to be specified
• Power supply 100 – 240 VAC ± 10%
• Power consumption 100 W, Frequency 50/60 Hz
• Sealing effectiveness of electrical enclosures (Ingress Protection rating Code) to be specified
• Immersion angle 10 – 50°
• Vertical adjustment range 220 mm
• Limit position detection adjustment range in mm 170 mm (electric lift) 100 mm (manual lift)
• Rotation speed range 10 – 280 rpm
• Max. flask capacity 3 kg

Heating Bath Base Specifications
• Dimensions (W x D x H) 18-20 x 25-30 x 80-85 cm (approx)
• Power supply 100 - 120 VAC ± 10% 220 - 240 VAC ± 10%, Frequency 50/60 Hz
• Power consumption (with bath) 1500 W

Item Code: 43
Water Bath Digital
Microprocessor-controlled temperature regulation
Temperature range: approx. 5 °C above ambient to +99.9 °C, 3 °C above tap water temperature to +99.9 °C approx.
Digital temperature LED display in increments of 0.1 °C, Touch keys,
Water level regulator
Constant temperature maintenance ±0.1 °C, with time,
Electronic monitoring of temperature- over temperature cut out (4 °C above set temperature)
Temperature range (operation with water level regulator): approx. 3 °C above tap water temp
Constant shaking with reciprocating motion, amplitude: 22 mm
Shaking frequency: from 10 - 250 rpm
Switch - On / off
Exterior dimensions (W x D x H): 71.5 x 52 x 33 cm
Interior dimensions (W x D x working height): 40 x 24.5 x 20.5 cm
Heating element, interior bath and shaking rack, cover, lid and perforated tray- stainless steel.
Capacity: approx. 20 ltr
Electrical connection:230 V / 50-60 Hz /1.5 kW
Warranty / guarantee should be mentioned
Make and Model should be mentioned
Prompt service support
Item Code: 44
Electrophoresis with Semi-dry Blotting Transfer System
A. Electrophoresis System
❖ Horizontal Electrophoresis Unit:
1. It should be an advanced version for the separation of DNA, RNA, and PCR products.
2. It should have electrodes which are easy to clean and well compatible with the universal power pack unit.
3. It should have a mini cell buffer dam.
4. The material of the electrophoresis unit should be of good quality.
5. Warranty should be 05 years from the date of purchase.
6. Gel casting tray (05 number), 8 well comb (10 number), 15 well comb (10 number) and electrodes should be provided with the unit.
7. 0.75 mm, 1 mm, and 1.5 mm combs of 08 well and 15 well should be provided with the electrophoretic unit.

❖ Vertical Electrophoresis Unit:
1. It should be a better and advanced version of vertical electrophoretic unit for the separation of protein.
2. It should have a tank, lid with power cables and electrode assembly.
3. It should have a mini cell buffer dam.
4. It should have two to four casting stands with four to eight casting frames.
5. It should have five to ten sets of glass plates for 1.5 mm thick gels.
6. It should have five to ten 10 well (1.5 mm thick) combs.
7. It should have five to ten gel releasers.
8. It should have a cell which can simultaneously run four to eight gels.
9. It should have five to ten sets of short glass plates and spacer (1.5 mm) with glass plates for mini cell of vertical electrophoresis unit.
10. It should have 5-10 gaskets.
11. It should have a well loader for better loading of the samples.
12. It should have cooling facility.
13. The electrodes of the unit should be compatible with the universal power pack.
14. Warranty should be five years from the date of purchase.

❖ Vertical Wet Transfer Unit:
1. It should provide rapid and high quality of protein transfer.
2. The transfer unit has the capacity to transfer two mini gels simultaneously.
3. The transfer unit should have two gel holder cassettes, 04 foam pads, electrode assembly and cooling unit.
4. The electrodes should be compatible with the universal power pack electrophoresis unit.
5. Filter pads should be provided with the unit.
6. Warranty should be five years from the date of purchase.

❖ Universal Power pac Unit for Electrophoresis
1. The universal power pac should be compatible with all advanced electrophoresis unit.
2. The power pac should provide rapid and efficient separation for protein as well as nucleic acids.
3. The power pac should be well compatible with the mini electrophoresis unit i.e. vertical as well as horizontal electrophoresis unit.
4. It should have capacity to gel run as well as gel transfer.
5. LCD screen display with all essential indicators should be available in the unit.
6. Constant voltage, constant current and constant power operation should be available in this unit.
7. The power output of the transfer unit should be 500 V, 2.5 A, 500W.
8. Pause and resume function should be there.
9. Real time clock and automatic power failure recovery facility should be there.
10. Input power for the unit should be 100-120, 220-240 VAC, 50/60 Hz.
11. The unit should be provided with the online UPS for better gel run and blotting.
12. 5 years warranty

B. Technical specification for Semi-dry Blotting Transfer System
1. The transfer system should be semidry one.
2. It should have high efficiency of quality protein transfer.
3. It should have high quality protein transfer with minimum time.
4. It should have high speed efficient and quality transfer system than normal transfer system.
5. It should have 1-2 blotting cassettes
6. Anode: Platinized titanium electrode plate
8. It should have capacity to transfer proteins simultaneously from 1-2 midi gels or 04 mini gels in one cassette.
9. It should have blot roller.
10. It should have input power: 100-240 VAC, 276 VA, 50-60 Hz, 175 W max.
11. It should have fuses.
12. It should have USB port and cooling fan facility.
13. Advance user interface should be there.
14. User notification and audible alarm facility should be there.
15. Good quality electrode should be there.
16. Two midi or four mini gels should be transferred.
17. Reusable gel trays and filter pads should be provided with the system.
18. LCD panel and Keypad facility should be there.
19. Latest model should be provided.
20. Technical presentation and demo should be provided on request.
21. Five years warranty should be provided.

Item Code: 45
TRANS BLOT TURBO TRANSFER SYSTEM
1. The transfer system combining Traditional blotting techniques with modern filter paper allowing rapid transfer of proteins from gels to membranes with minimal preparation time.
2. High amperage power supply that directs current between a built-in platinize titanium anode and stainless-steel cathode.
3. Highly efficient and rapid transfer in as little as 3 minutes.
4. System is in ready to use format.
5. High reproducibility.
6. Rapid transfer-Transfer mini or midi gel in as little as 3 min.
7. High throughput- can transfer 1-4 mini or 1-2 midi gels in a single run.
8. Greater transfer efficiency-higher transfer efficiency compared to other transfer methods.
9. Flexible design- Allowing user to customize transfer conditions and is compatible with traditional semi-dry consumables.
10. Environmentally friendly and eliminating disposal cost.
11. Box of 10 transfer packs.
12. 5 years warranty

Instrument
1. Dimensions: (L x W x H) 26.0 x 21.1 x 20.4 cm
2. Weight: 8 lb with cassettes, 4.5 lb without cassettes
3. Input power: 100-240 V, fuses located above the power connection
4. On/off switch: Yes, mains connected
5. USB port for input and firmware updates
6. With cooling fan
7. Output power: 0-26 VAC (1 V increments), 0-2.6 A DC (0.1 A increments) for each cassette
8. Operating conditions: 15-31-degree Celsius ambient temperature, 0-95% relative humidity (noncondensing)

User Interface
1. 18 button keypad, 128 x 64-pixel monochrome display
2. Programmed methods: Up to 25 users defined
3. Programmed methods: Standard SD, 1.5 mm gels, High MW, Low MW, Mixed MW
4. 1 Mini-PROTEAN TGX Gel
5. Audible alarm
6. User notifications:
   a) Power fail during run
   b) No load detection
   c) No cassette detection
   d) End of run
   e) Watt/hr limit

Transfer cassettes
1. Dimensions: (L x W x H) 20.2 x 16.0 x 4.5 cm
2. Anode: Platinized titanium electrode plate
3. Cathode: Stainless steel
4. Weight: 1.5 lb

Gel Compatibility
1. Suitable for transfer of two mini format gels or one midi format gel per cassette. Other gel sizes can be trimmed to fit the consumable transfer packs.

Transfer Packs
1. Tray dimensions (L x W): 18.0x14.5 cm
2. Stalk dimensions (L x W): mini format (7 x 8.5 cm), Midi format (13.5 x 8.5 cm) + tab
3. Pad materials and buffer: proprietary
4. Membrane: 0.2 micrometre nitrocellulose or 0.2 micrometre PVDF

Transfer Kits
1. Membrane dimension (L x W): Mini format (7.0 x 8.5), midi format (13.5 x 8.5 cm)
2. Membrane: 0.2 micrometre nitrocellulose, 0.2 micrometre PVDF, or 0.45 micrometre low fluorescent PVDF
3. Pad materials and buffer: proprietary
4. Gel tray: two reusable trays to wet and equilibrate membrane and pads

Item Code: 46

OXYGRAPH
Liquid-Phase Oxygen Electrode System for Respiration & Photosynthesis Studies
1. PC operated oxygen electrode control unit with USB connectivity
2. Clear cast acrylic DW1/AD oxygen electrode chamber with integral Clark type polarographic oxygen electrode
3. Suitable for liquid-phase samples with 0 – 100% oxygen concentration
4. 24-bit high resolution measurement of oxygen signals
5. Integral systems for measurement of Ph& other ion-selective electrode signals using separate respective electrodes
6. System expansion to 8 channels via purchase of additional systems
7. Should be capable of making comprehensive analysis of oxygen activity simultaneously with signals from sensor for pH, TPP+, Calcium, potassium and hydrogen ions.
8. OxyTrace+ Windows® software for data acquisition, hardware control & data analysis
9. Post-acquisition analysis tools allow automatic Calculation of oxygen rates from user-defined rate intervals with saved Comma Separated Values (CSV) data files opening effortlessly in external data processing packages such as MS Excel®.
10. Real time 0 – 4.5v analogue output of oxygen electrode signal.

**Technical Specifications of Electrode Control Unit**
1. Measuring range: Oxygen: 0 - 100% | pH: 0 - 14pH | Aux: 0 - 4.096V
2. Signal inputs: Oxygen electrode (SMB) | pH/ISE (BNC) | Auxiliary (8 pin Mini Din)
3. Resolution: Oxygen: 0.0003% (24-bit) | pH: 0.0006pH (16-bit) | Aux: 62.5μV/bit (16-bit)
4. Polarising voltage: 700mV
5. Input sensitivity: 0 - 9000nA
6. Magnetic stirrer: Software controlled 150 - 900rpm in % steps
7. Sampling rate: 0.1 - 10 readings/s
8. Electronics: Microcontroller: 16-bit high performance CPU running at 32 MHz
9. ADC: Dual, Low power, 16/24 Bit Sigma Delta
10. Communications: USB2.0
11. Analogue output: 0 - 4.5V O2 signal
12. Dimensions (HWD): 200 x 110 x 60mm
13. Weight: 0.45 Kg
14. Power: 12V dc @ 100mA, 90Vac – 264Vac @ 1A

**Technical Specifications of Electrode Chamber**
1. Suitability: Liquid-phase respiration/photosynthesis
2. Construction: Clear cast acrylic
3. Sample chamber: Precision bore, borosilicate glass tube
4. Sample volume: 0.2 - 2.5ml
5. Temperature control: Water jacket connected to thermoregulated circulating water bath
6. Dimensions (DH): 65 x 105mm
7. Weight: 100g
8. Plunger: Variable height plunger assembly with central bore for sample additions

**Oxygen Electrode Disc**
1. Electrode type: Clark type polarographic oxygen sensor
2. Electrode output: Typically, 1.6μA at 21% O2
3. Residual current: Typically, 0.04μA in 0% O2
4. Response time: 10 - 90% typically < 5 seconds
5. Oxygen consumption: Typically, <0.015μmol/hr
6. System should be supplied with basic spares.

**Item Code: 47**

**AUTOCLAVE**
1. Sturdy construction, Double walled,
2. Inner chamber i.e. boiler made of 16 SWG stainless steel (0.064 inch) of 304 quality
3. Outer shell - thick mild steel duly painted.
4. Boiler and Outer shell provided with air insulation
5. Lid made up of thick mild steel and tightened by radial locking system
6. Joint less neoprene gasket
7. Paddle lifting device to open and close lid
8. Fitted with water indicator, pressure gauge, steam release cock, Safety valve, spring loaded safety valve.
9. Power Consumption (KW): 3 kW
10. Pressure Range: 5-20 psi
11. Temperature Range: 121 °C
12. Chamber Volume: 50 L
13. Size (Dia x Depth): 350 mm x 550 mm
14. Stainless steel perforated basket
15. Cord plug work on 220V ± 50Hz
16. Warranty / guarantee should be mentioned
17. Make and Model should be mentioned
18. Prompt service support

**Item Code: 48**

**FERMENTER**

**Housing:** Metal housing, coated

**Operating Temperature:** 0 °C – 60 °C

**Maximum relative humidity:** 80% for temperatures up to 31 °C
decreasing linearly to 50% relative humidity at 40 °C

**Motor drive:** – Maintenance-free, Quiet direct drive, 150 W

**Motor rpm:** Direct coupling
- 1 L Glass: 30 – 1,400 rpm
- 2 L Glass: 30 – 1,100 rpm
- 5 L Glass: 30 – 800 rpm
- 2 L SU: 30 – 400 rpm

**Integrated Pumps**

**Controller Fixed speed:** (regulated on|off) Speed 40-50 rpm

**Pump head:** Watson Marlow 114, Fast Load pump head

**External Pumps**

**Controller:** Regulated rpms

**Speed Max:** 180-250 rpm

**Pump head:** Watson Marlow 120, Fast Load pump head

**Probes and Controllers**

**Temperature, separate sensor:** Temperature control 0 – 60°C
Display resolution 0.1°C

**Temperature integrated in pH probe:** Temperature control 0 – 60°C Display resolution 0.1°C

**DO probe, reusable:** Polarographic probe, Digital communication with Control Tower,
Range: 0 –100%, Display resolution: 0.1%

**DO sensor, single-use:** DO sensor patch, Range: 0 –100% air saturation, Display resolution: 0.1% air saturation

**pH probe, reusable:** Combination electrode, digital communication with Control Tower
Range: 2 – 12 pH

Display resolution: 0.01 pH

**pH sensor, single-use:** pH sensor patch, Range: 6 – 8 pH, Display resolution: 0.1 pH

**Foam, alternative level:** Electrical conductivity sensor, stainless steel, ceramic insulated

**Gas inlet** – Gas pressure 1.5 barg (21.76 psig) ±10%, Gases: dry, oil and dust-free, Gas inlet connections with hose barb for 6 + 3 mm (0.24 + 0.12 in.) reinforced tubing
Gas outlet – Gas outlet pressure: max. 0.8 barg (11.6 psig), Outlets to the culture vessel with hose barb for 3.2 + 1.6 mm (0.12 + 0.06 in.) silicone tubing. Continuous and automatic aeration control for air and O2. Gas flow control units: Total of two, one per gas segment.

**Measuring and control accuracy of the gas flow control units ± 5% full scale**

**Material:** Borosilicate glass, stainless steel

**Power supply:** 100 to 240 VAC, 50/60Hz, 8 A

Recommended Voltage Stabilizer, (Servo)- 3KV

**Warranty guarantee should be mentioned**

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Name of the Equipment</th>
<th>Detailed Specifications</th>
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<tr>
<td>49</td>
<td>Mechanical Weighing Machine</td>
<td>Reading on both sides, Robust lever system, Platform and column: powder coated, weighing head: cast iron, Platform with non-slip plastic cover, Measuring range height rod: 750 – 2,000mm - Graduation 5mm, Also double graduated (kg/lbs) available, Capacity: 200kg – Graduation: 100g</td>
</tr>
</tbody>
</table>
| 50        | Anthropometer Measuring Set | These include
• Instruments for measuring distances in straight lines
• Instruments for measuring curves and circumferences
• Instruments for measuring thickness
The Anthropometer Measuring Kit has been designed to remain faithful to the original basic rules, but also to include instruments used most frequently.
• Anthropometer consisting of 4 pipes, made of brass 0 - 1950mm
• Rod Measures, straight rules 0 - 270mm, curved rules 0 - 280mm
• Tasterzirker Callipers, brass 0 - 450mm
• Gleitzirkel Martin’s Thickness Gauge, stainless steel/brass 0 - 200mm
• Stainless steel rule, 0 - 150 mm
• Stainless steel tape measure, 0 - 2000mm
• Finger Sterilizing Case, and
• Sturdy Carrying Case |
| 51        | Weighing Scale cum Height Measuring Sales (Stadiometer) | A stadiometer is a piece of medical equipment used for measuring human height. It is usually constructed out of a ruler and a sliding horizontal headpiece which is adjusted to rest on the top of the head. Stadiometers are used in routine medical examinations and also clinical tests and experiments. Height Measuring Scale, floor model With MECHANICAL weighing scale
Measuring range: 20 - 205cm with 1mm Graduation.
Measuring in inches and centimetres. Weighing capacity: 130Kg. x 0.5Kg. Graduation |
| 52        | Platometer (to measure the palate) | The platometer to measure the palate. Graduated slide up to 25 mm. GPM Swiss made Net weight: 0.130 kg |
| 53        | Cubic craniophore | Cubic craniophore, precise, 28-cm square, which would add, in one of the lower corners, one arm carrying a clamping jaw double ball, GPM Swiss made Cubic craniophore The horizontal tracing needle, to orient the skull in three planes using certain cranial
landmarks. The diagraph recording, to make a partial or complete study of the contours of the skull, and to build for measuring the sphenoid angles, prognathism, etc. ...

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<tbody>
<tr>
<td>54</td>
<td>Mandibulometer  It is a device for any precision study of the mandible. GPM Swiss made Horizontal and vertical scales, rapporteur to measure the angle of the two branches. Net weight: 1,200 kg</td>
</tr>
<tr>
<td>55</td>
<td>Osteometric board  Table of: 60 cm length x 25 cm width. Osteometric board Made of PVC. To measure the length and height of a bone, and to determine angles and curves. The horizontal side, covered with graph paper, protected by glass. A removable steel circle allows to measure angles. According to the required measure, or dimensions of the bone, this circle can be placed at three different locations on the table. GPM Swiss made. Net weight: 2,900 kg</td>
</tr>
<tr>
<td>56</td>
<td>Parallelograph  The parallelograph to measure the angle of joint axes. GPM Swiss made Net weight: 1.800 kg</td>
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<tr>
<td>57</td>
<td>Tubular craniophore  (Martin type)  GPM Swiss made</td>
</tr>
<tr>
<td>58</td>
<td>Diaptograph  Rectangular  (Martin type)  GPM Swiss made</td>
</tr>
<tr>
<td>59</td>
<td>Fingerprint development kit  1:1 matching spec: 20ms  Template size per fingerprint: 256 bytes  Fingerprint sensor resolution: 300-500 dpi  Communication interfaces: UART 1200-115200bps; USB2.0 full and high speed</td>
</tr>
<tr>
<td>61</td>
<td>Life corder  (Physical activity recorder)  Steps, active, distance (in miles or kilometers), MVPA (active) time, calories, total calories, time of day, activity intensity review graph (METS)  • Made in Japan uniaxial internal sensor mechanism and CPU  • Can be set for imperial (inches) or metric (centimeters) units  • User settings: age, height, weight, gender  • Calculates BMR  • Goal settings: steps per day, active steps per day and MVPA (active) minutes  • Countdown &quot;To Target&quot; &amp; Scrolling Achievement Messages  • 9 Intensity Zones  • Event Marker Key  • Advanced settings: low and high intensity levels, keylock or unlock and memory loop or lock  • 60-day downloadable memory--recalls the last 7 days of data on the activity monitor's display  • Direct USB Link to PC  • Automatically resets daily totals at midnight  • Silent--makes no clicking noise  • Counts steps at slower speeds and on the overweight and obese better than suspended-lever arm pedometers  • Activity monitor dimensions: 2 3/4 x 1 1/2 x 3/4 inches (6.985 x 3.81 x 1.905 cm)  • Activity monitor weight: 1.7 ounces (48.19 grams)</td>
</tr>
</tbody>
</table>
| 62 | Lifecorder EX accelerometer | 200 Day Downloadable Memory  
• 7 Day Memory on Display  
• 9 Intensity Zones  
• Displays Steps, Kcals and % Goal  
• Calculates BMR  
• Direct USB Link to PC  
• Event Marker Key  
• Dimensions: 2 3/4” x 1 1/2” x 3/4”  
• Weight: less than 2 ounces  
• Battery operation; uses a CR2032 battery included  
• Battery life: approximately 6 months  
• Security strap included  
Software and Computer to store data |
| 63 | Pedometer | Steps: 0 to 99,999 steps  
Distance: 0.0 to 3,725.9 miles / 0.0 to 5,999.9 km  
Calories: 0 to 59,999 kcal  
Aerobic steps: 0 to 99,999 steps  
Pitch: 0.0 to 9,999.9 step/min (in increments of 0.1 step/min)  
Time: 12:00AM to 11:59PM / 0:00 to 23:59.  
Previous 7 days on display.  
Time: 12:00AM to 11:59PM / 0:00 to 23:59  
Weight: 22 to 300 lb (in increments of 1 lb) / 10 to 136 kg (in increments of 1 kg)  
Height: 3’4” to 6’6” (in increments of 1 inch) / 100 to 199 cm (in increments of 1 cm)  
Stride length: 12” to 48” (in increments of 1”) / 30 to 120 cm (in increments of 1 cm) |
| 64 | Digi-Walker Professional | Counts steps up to 99,999 whilst walking or jogging.  
Calculates distance walked or jogged.  
Calculates calories used from 0.01 kcal to 9,999 kcal.  
Set average stride length in 1cm increments. |
| 65 | Digital Skinfold Caliper | This should accurately determine body fat by using "skinfold" method. It can measure any body part such as thigh, waist, bicep and chest. It should have wide measuring range from 0 ~ 50 mm (0 ~ 2 inches). The body fat thickness can be displayed in mm or inches. It should have "hold" button to display measured value. |
| 66. | Laminar Air Flow | **Air flow direction:** horizontal  
**Air cleanliness:** Class 100  
**Construction:** SS / Powder coated MS / GI sheet  
**Sash (front door):** Manual sliding type (Acrylic transparent)  
**Side panels:** Acrylic / polycarbonate / SS  
**Air velocity:** 0.45 m/s to 0.65 m/s  
**Illumination:** 1 or 2 LED Light  
**Noise level:** 65 ±5 db  
**Power supply:** 220 volts / 50 Hz  
**Air filtration:** Pre-Filter - 10 microns (washable)  
HEPA filter (0.3 Microns)  
**Standard fittings Optional:** Air / gas cock |
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<tr>
<td><strong>Mains, UV Light, Light, Blower on/off switch</strong></td>
<td><strong>Motorized sliding door</strong></td>
</tr>
<tr>
<td><strong>LCD display for velocity, time &amp; lamp on/off, UV Germicidal lamp, UV Hour meter</strong></td>
<td><strong>Magnahelic gauge</strong></td>
</tr>
<tr>
<td><strong>Levelling lugs for stand</strong></td>
<td><strong>DOP HEPA filter testing</strong></td>
</tr>
<tr>
<td><strong>05 yrs Comprehensive Warranty guarantee should be mentioned</strong></td>
<td></td>
</tr>
</tbody>
</table>

| 67 | Magnetic stirrer with hotplate (2 lit) | Heating power: 500 / 1000 W. Speed range: 100 - 1500 RPM |

| 68 | Invertor 5 KVA (on line UPS) | **Technical specification for 05 KVA Online UPS (With 26 AH Battery)** |
|    |   | Backup- 60 minutes/ 30 minutes |
|    |   | Double Conversion True On Line UPS |
|    |   | PWM With IGBT Technology |
|    |   | Inbuilt Galvanic Isolation Transformer |
|    |   | I Ø Input I Ø Output |
|    |   | DC Voltage - 180V DC |
|    |   | Input Voltage: - 180V - 270V |
|    |   | Output Voltage: - 230V ± 1% |
|    |   | Input Frequency: - 50Hz |
|    |   | Power Factor: - 0.8 Lag to Unity |
|    |   | Battery Make- Exide |
|    |   | UPS Make and model to be specified. |
|    |   | Rates to quoted inclusive of all taxes F.O. R. destination |
|    |   | Separately quote the price for comprehensive three years warranty |

| 69 | Invertor 10KVA (on line UPS) | Sine Wave Inverter |
|    |   | Capacity – 10 KVA, Rated Power –8500 W |
|    |   | Supports Fifteen battery |
|    |   | 60 + Month Warranty |
|    |   | Safe for sensitive appliances with Sine wave out-put |
|    |   | Cruze HKVA Inverters can run heavy loads like AC, Geyser, Petrol Pumps, Photocopiers, Dental Chairs etc., depending on their capacity (please check the inverter capacity and your power requirement) |
|    |   | Auto over-load handling capacity |

<p>| 70 | Centrifuge (cooling and non-cooling are to be quoted separately) | • The preparative refrigerated tabletop centrifuge model should be capable of going to speeds of more than 18000 RPM; equivalent to ~ 29,000xg |
|    |   | • Swing out rotor: Max. Speed -4,700 RPM &amp; -4,255xg |
|    |   | • Set Speed: 200 to 18,000 RPM |
|    |   | • Set time – 1min to 9hrs 59 min or continuous (hold) |
|    |   | • Total capacity of the centrifuge should be 4 X 400mL |
|    |   | • Brushless induction drive system for clean, quiet operation |
|    |   | • The centrifuge should be microprocessor controlled, providing interactive operation |
|    |   | • The instrument should be having temperature range from -200°C to 400°C and ambient temperature range from +2°C to 40°C |
|    |   | • Acceleration/Deceleration Profiles: 10/10 |
|    |   | • Alarm/Alert system for power failure, lid opening |</p>
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|   | • Automatic imbalance/ rotor detection  
• Emergency lid lock release option during power failure  
• Sound level should be <68 dBA  
• Power supply: 230 V ±10%, 50Hz  
• Warranty/Guarantee should be mentioned  |   |
| **Rotors required:** | ▪ **Fixed Angle Rotor:** 24 x 1.5/2.0 mL, RPM- more than 18,000 & RCF- more than 29,000g Force. Adapter for running 0.25mL,4mL tubes to be provided  
**Swing Bucket Rotor:** 4 x 400mL, RPM-more than 4,500 & RCF-more than 4,255g force. Adapter for running 15mL and 50 mL conical tubes to be provided  |   |
| 71 | **Body composition analyser** | Build-in thermal printer with 2 testing frequencies: 50, 250KHz  
electrodes, whole body testing Large (8') colour TFT touch LCD  
Automatic weight scale Automatic personal information memory  
Support colourful report  |
| 72 | **Portable spirometer** | High Resolution Coloured LCD Display Built in Thermal Printer  
Storage for 2500 Patient’s Data FVC, SVC, &MVV Tests  
Evaluation of 51 Vital Parameters with Interpretation Indian  
Predicted Equations Facility to Download Data to PC Features.  
Capacity 6 litre complete with chain / chord compensates counter  
balance to float through pulley. Tube calibrated to denote volume.  
Inlet and outlet tubes provided. Complete with corrugated tube and  
mouth piece.  |
| 73 | **Bone densitometer** | Motorised scan table with integrated motorized C-arm high  
density multi-detector array assembly.  
2 • Advance computer system,  
3 • Colour Printer  
4 • Automated internal calibration system with ability to store and  
analyse date  
5 • Single energy scan switch capability,  
6 • Automated bone mapping features(without operator involvement),  
7 • Mobile computer table  
8 • Ability to scan lumber sine(AP and Lateral),femuir, Forearm,  
9 • Software for whole obody composition,  
10 • One page report print out.  
11 • Supine lateral imaging,  
12 • Supine lateral lumbar spine densitometery for volumetric calculation of BMD,  
13 • Phantoms for spine and whole body  
14 • Table pad and positioning accessories,  |
| 74 | **Treadmill** | For high end lab use, 4 HP powerful AC motor (2 HP continuous),  
Speed : - 1 ~ 20 kmph, Incline : 0 ~15%, Running surface : 20 x 60  
inches, 7” large LCD window that readouts : time, speed, distance,  
incline, calories and programs, Various workout programs, to meet  
different user requirements, Instant speed and incline keys,  
Speakers to connect with Mp3 or Ipod, Innovative cushioning  
system, Heavy duty running belt, Cylinder provide hand free deck  
folding system, Easily foldable, Maximum User Weight: 120 Kgs  |
| 75 | **Heart rate belt** | 12/24 hour with hour/minute/second Stopwatch: 00:00:00 to  
29:59:59 (hrs:min:sec) Heart Rate Measurement: 30 - 240bpm  
Upper Limit: 80 - 240bpm Lower Limit: 30 - 220bpm Transmitter  
Strap: 12 inches to 44 inches Weight: Watch (Receiver) - approx.  |
40 g (included battery) Chestbelt (Transmitter) - approx. 68 g (included battery) Power: Watch-1 ps CR 2032 3V battery Chestbelt-1 pc CR 2032 3V battery Operating Temperature: -10ºC to +50ºC (14ºF to 122ºF) Storage Temperature: -20ºC to +60ºC (-4ºF to 140ºF) Water Resistance: not actuating keys to 30 m

**76.** Hand dynamometer  

**77.** Leg dynamometer  
Strength Testing: Back, Legs & Chest, Range: 0-300kg, Graduation 1kg

**Item Code: 78**  
**STEREOMICROSCOPE WITH CAMERA ATTACHMENT**  
(Stereo binocular Microscope with photo micrographic attachment)

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Optical System</strong></td>
<td>Stereomicroscope with Greenough Optical System and fully apochromatic optical system. Focussing column with 500 mm or better.</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>Up to 500 lp/mm or better with 12 mm depth of field and 37 mm or better object field.</td>
</tr>
<tr>
<td><strong>Zoom Ratio</strong></td>
<td>9:1 or better with total Magnification range of 6.1X to 55X or better Manual zoom 8:1 Zoom range 0.63x to 5.0x</td>
</tr>
<tr>
<td><strong>Accessible magnification range</strong></td>
<td>1.9X to 250X</td>
</tr>
<tr>
<td><strong>Observation tube</strong></td>
<td>Binocular tube inclined at 35 degrees or lower with interpupillary distance adjustment range from 50 –75 mm or better Integrated high-resolution camera of 10 MP with live imaging capability of 31 fps or better. Should have USB, network and HDMI connectivity.</td>
</tr>
<tr>
<td><strong>Eyepiece</strong></td>
<td>Widefield paired eyepiece of 10x having F.O.V 23 mm or better with Diopter adjustment for both eyes.</td>
</tr>
<tr>
<td><strong>Objective</strong></td>
<td>Apochromatic objective of 1x with working distance 120 mm</td>
</tr>
<tr>
<td><strong>Transmitted Illumination</strong></td>
<td>Transmitted light LED stage with black &amp; white stage plate, rotatable knob for creating effects of light on sample.</td>
</tr>
<tr>
<td><strong>Bulb lifetime at dimming level 50/80/100%</strong></td>
<td>Typ 1500 h / 150 h / 50 h</td>
</tr>
<tr>
<td><strong>Light Flux (output of ringlight, fiber bundle diam. 9 mm)</strong></td>
<td>Max. 600 lm at 100 % dimming / ~ 450 lm at 80 % dimming</td>
</tr>
<tr>
<td><strong>Reflected light</strong></td>
<td>Reflected multiple LED’s based ring light illumination.</td>
</tr>
<tr>
<td><strong>Software</strong></td>
<td>The software should be able to carry out measurements of length and circumference on live image. The microscope, camera and software should be from the same manufacturer.</td>
</tr>
<tr>
<td><strong>PC</strong></td>
<td>Pentium i5/i7 chipset or better with min. 8 GB RAM, 1TB SATA HDD, DVD R/Wr, 2GB NVIDIA graphics accelerator with 8 GB RAM and 24” or larger LED Monitor.</td>
</tr>
<tr>
<td><strong>Connectivity</strong></td>
<td>Should have USB, network and HDMI connectivity</td>
</tr>
<tr>
<td><strong>Optional Accessories</strong></td>
<td>0.63X Objective and 2.0X Objective</td>
</tr>
<tr>
<td><strong>Essential</strong></td>
<td>Should provide 5 Year warranty and 5-year AMC.</td>
</tr>
</tbody>
</table>
**Item Code: 79**
**FLUORESCENCE MICROSCOPE**  
(Upright Epi-fluorescence microscope)

<table>
<thead>
<tr>
<th>Specifications Upright Epi-fluorescence microscope</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Microscope Body:</strong> Automated microscope for brightfield, darkfield, phase contrast and fluorescence applications with LED illumination for transmitted light with minimum lamp life of 50000 hrs or better. Should have integrated compensation mechanism to eliminate any focus drift during long term observation to ensure consistent sharp image. Built in coarse and fine focusing knobs with different focusing functions. Automated objective nosepiece with minimum 6 positions or better. Built in Koehler illumination.</td>
</tr>
<tr>
<td><strong>Condenser:</strong> Universal turret condenser with 6 positions or better suitable for all techniques.</td>
</tr>
<tr>
<td><strong>Objectives:</strong> High Resolution objectives suitable for above mentioned brightfield techniques and fluorescence 10x/0.25 PH, 20x/0.35PH, 40x/0.75PH FL and 100x/1.32PH FL (oil immersion).</td>
</tr>
<tr>
<td><strong>Eye piece:</strong> Pair of eye piece 10x with 22 mm field of view and dioptre adjustment for both eyes.</td>
</tr>
<tr>
<td><strong>Observation tube:</strong> Trinocular tube with 0/100 beam splitter for acquiring max signals.</td>
</tr>
<tr>
<td><strong>Stage:</strong> Mechanical xy stage with coaxial xy drive and both right- and left-hand operation.</td>
</tr>
<tr>
<td><strong>Fluorescence Illumination:</strong> Fluorescence filter turret with minimum 5/6 position filter turret along with Fluorescence Bandpass filters for DAPI, GFP/FITC, TRITC/Rhodamine. LED based fluorescence illumination with minimum lamp life of 25000 hrs or better. The unit should be controlled by same imaging software, should accompany with control panel for changing the wavelength and controlling intensity. Should include LEDs for UV, Blue, Green, Yellow and Red excitation. Pixel shift corrected fluorescence filters for DAPI/Hoechst, FITC/GFP and TRITC/Rhodamine/Cy3.</td>
</tr>
<tr>
<td><strong>Camera:</strong> High resolution dual mode (monochrome &amp; colour) Peltier cooled scientific CCD/CMOS 2/3” chip camera with 7 MP resolution and image acquisition of 18 fps or better in both modes. Should include 0.63x/0.7x C-mount adaptor.</td>
</tr>
<tr>
<td><strong>Software:</strong> Licensed imaging software for Fluorescence multichannel acquisition, image analysis, Intensity measurements, counting, line profile, spatial measurements such as length, width, area, perimeter etc. Software should control all the automated components including microscope and light source. Exported image formats: JPEG, TIFF, BMP, PNG (image), CSV (raw data).</td>
</tr>
<tr>
<td><strong>Data Processing Unit:</strong> Branded PC with i7 processor, minimum 8 GB RAM, NVIDIA graphics card with 2 GB RAM, 1TB SATA HDD or higher, Original Windows 10 OS, DVD RW, at least 24” monitor, keyboard and optical mouse.</td>
</tr>
<tr>
<td><strong>Note:</strong> Microscope, camera and software should be from same manufacturer. Valid European CE/FDA and ISO certifications of the quoted model should be submitted. UPS: At least 01-hour power backup for both Microscope and Computer. Should provide 5 Year warranty and 5 years comprehensive AMC.</td>
</tr>
</tbody>
</table>

**Item Code: 80**
**GRADIENT PCR**
1. Gradient Thermal Cycler with Peltier heating and cooling based system.  
2. Should be supplied with block of 96x 0.2 ml.  
3. The block should also have dynamic gradient capability.  
4. Only dynamic gradient technology will be accepted.  
5. A total of 8 gradients should be possible using both the blocks.  
6. Should also have an option to add 2 x 48 X0.2 ml Block or 384 Well Block. All the blocks should have the gradient capability.  
7. Should have a maximum ramp rate of 5 °C/second.  
8. Should have adjustable heated lid.
9. Should have block and calculated temperature control modes.
10. Should have protocol auto writer for easier programming to run a standard, fast or ultrafast protocol.
11. Should have a temperature range of 0-100 °C
12. Should have a temperature accuracy of ± 0.2 °C
13. Should have a temperature uniformity of ± 0.4 °C well to well within 10 seconds of arrival at 90 °C and have 6 Thermoelectric modules.
14. Should have a gradient range of 30-100 °C and use dynamic ramping for gradient.
15. Should have a high-resolution touch screen display with 6 USB ports for Protocol transfer and multiple connectivity.
16. The system should be capable of connecting up to 32 PCR/Real Time PCR and can be operated using a PC or directly from the PCR system.
17. Should have a memory of >1000 programs with further expansion through a USB Flash drive for transfer of files.
18. Option to protect files with optional log-in, restricted user privileges and secured mode for controlled environment should be there.
19. Should have automatic option for graphical or text-based programming
20. The software should have exportable Run logs and system error logs
21. The system should be capable of using through a PC or without it.
22. It should be possible to control additional 3 cyclers through one instrument.
23. Should be upgradeable to a 6 Channel Real Time PCR with gradient capability.
24. Should have O-ring seal to protect thermal electric modules.
25. Should be licensed for Research and IVD Applications.
26. 5 years warranty

**Item Code: 81**

**PHASE CONTRAST INVERTED MICROSCOPE WITH CAMERA**

1. Inverted microscope frame with minimum 5-watt LED to maintain constant colour temperature through all stages of intensity with auto cut off function to save the energy. 50 W HgIllumination with lamp housing and power supply
2. Metal body with scratch resistance stages, Universal Slide holders and object guide must be supplied with the microscope
3. Long working distance condenser 80 mm for the larger volume cell container must be quoted, longer working distance should be provided as preference
4. Observation methods: Fluorescence: blue green excitation, UV excitation, Phase contrast, inverted contrast, bright field
5. Objectives for microscope with Integrated phase slider
   4X Plan Objective
   10X Phase Objective NA 0.2
   20X Phase Objective NA 0.3
   40X Phase Objective NA 0.5
6. 4 Position Objective Holder, Objective holders for petridish and 96 well plate and tissue culture flasks
7. 10X Eyepiece with FN 20
8. Camera Attachment: 5 Megapixel HD camera frame rate 30fps with, Pixel size 2.35X3.35 μm, sensor grade CMOS, Gain:1X-12X, Colour Depth 24 bit
9. Image capture and analysis software, Basic analysis like linear measurement and Area
10. The Microscope, camera and software should be supplied from the same manufacturer for better compatibility.
11. Computer System should be provided with the unit having: CPU core i5, RAM -4 GB, HDD-1TB, USB2, OS, WIN10 prof 64-bit, external graphics card 2GB, wide screen 21” or higher and 2 KVA offline UPS
12. Should provide 5 Year warranty and 5 years comprehensive AMC.

**BINOCULAR PHASE CONTRAST MICROSCOPE**
1. Upright Binocular Microscope with sturdy stand
2. LED illumination - high intensity, uniform (uniform illumination throughout the field even at low magnifications).
3. 4 Position objective holder
4. 10X eyepiece with FN 20
5. 10,20,40,100X Objective, 100X should be oil immersion (all Phase Contrast)
6. Universal condenser. Sidentopf-type Trinocular tube with light path selector Nosepiece - Quintuple or above to accommodate 5 or more objectives at a time.
7. Stage to hold and move the slide
8. Coarse and fine focus knob
9. Antimicrobial treated touch point which will inhibit the growth of micro-organism at laboratory environment on the microscope
10. Microscope should be upgradable with integrated camera system without changing existing binocular head.
11. High quality Digital camera - 5 megapixel or above CCD, with necessary image acquisition & measurement and analysis software and required firewire cables. Computer system for image capture & analysis – Intel i5 processor, 1TB Hard disk, 4GB Ram, 2 GB graphics card, 20” monitor, Windows 7 OS and a suitable UPS with 20 mts backup and high quality colour printer.
12. The microscope and camera should be from the same manufacturer for better synchronization.
13. Should provide 3 Year warranty and 2 years comprehensive AMC.

**Item Code: 82**

**WATER PARAMETER ANALYSER**

<table>
<thead>
<tr>
<th></th>
<th>Central Wiper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth / Pressure Rating / Limit</td>
<td>0 to 250 m (0 to 820 ft)</td>
</tr>
<tr>
<td>Desktop Software Compatible</td>
<td>Yes</td>
</tr>
<tr>
<td>Flow Cell</td>
<td>Yes</td>
</tr>
<tr>
<td>Languages</td>
<td>English</td>
</tr>
<tr>
<td>Logging Capabilities</td>
<td>Yes</td>
</tr>
<tr>
<td>Medium</td>
<td>Fresh, sea or polluted water</td>
</tr>
<tr>
<td>Memory</td>
<td>&gt;1,000,000 logged readings, 512 MB total memory</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Yes</td>
</tr>
<tr>
<td>Multiparameter</td>
<td>Yes</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-5 to +50°C</td>
</tr>
<tr>
<td>Power</td>
<td>4 Alkaline Batteries</td>
</tr>
<tr>
<td>Sampling</td>
<td>Yes</td>
</tr>
<tr>
<td>Smart Sensors / Ports</td>
<td>Yes</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-20 to +80°C</td>
</tr>
<tr>
<td>Unit of Measure</td>
<td>Parameter Dependent</td>
</tr>
<tr>
<td>User Calibratable</td>
<td>Yes</td>
</tr>
<tr>
<td>Waterproof</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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Item Code: 83

BIOCHEMICAL ANALYSER
(Automated Clinical Chemistry Analyzer)

1. It should be Automated, Discrete, Bench Top Random-Access Clinical chemistry Analyzer capable of performing biochemistry and immunoturbidimetry assays.
2. The throughput should be at least 200 tests/hr photometric tests.
3. It should have UPTO 50 onboard parameters chemistries & 4 ISE (optional)
4. It should not have any limit on number of programmable Chemistries, Profiles and Calculation Item.
5. It should accept Linear, Non-Linear, Multi Point Calibration.
6. Sample disk should accept minimum 39 samples at a time. All the positions on the sample disk should accept STAT samples, blanks, controls, standards and ISE solutions.
7. It should accept 5 ml, 7 ml, 10 ml and sample cups for keeping samples.
8. The sample pipetting should be between 2 – 65 ml with the increment of 0.2 ml.
9. The reagent tray should be cooled and should accept 50 reagent position. It should accept both 20 ml, 50 ml bottles and 5 ml adopters.
10. Display of Reaction Cuvette temperature and Reagent Tray temperature should be available on Sc
11. System should be capable of performing 1& 2 Reagent Chemistries.
12. It should have barcode reader for both reagents and samples (Optional).
13. Reagent pipetting should be between 50 – 300 ml in steps of 1ml.
14. Probe heating facility for de-contamination & incubation.
15. The reaction cuvettes should be around 45 and made up of permanent hard glass cuvettes (non-disposable).
16. On line Reaction Graph should be displayed on the screen and all the reaction graphs should be stored in the memory.
17. The minimum reaction volume should be less than 200 ml.
18. It should have on board laundry for washing of the cuvettes. 6 stage cleaning & 2 stage drying with cuvette validation step.
19. Photometer should consist of 8 stationary filters. 340, 405, 505, 546, 578, 600, 660 and 700 nm. It should be capable of doing Monochromatic and Bichromatic measurements.
20. Detector is 8 silicon photo diodes
21. Light source should be Halogen Lamp.
22. Absorbance range should be 0.0 – 3.0 Abs.
23. It should have extensive Q. C. program. Should show daily and monthly Levy Jennings Chart and should also have Westgard Rules.
24. It should have facility of auto re-run, auto dilution of sample facility,
25. Facility of Skipping of dirty cuvettes should be available.
26. The mixing stirrers should have user defined variable speed (minimum 3 speeds).
27. Probe should have Vertical obstruction Detection.
28. Suitable DI water plant to be supplied along-with equipment.
29. Suitable UPS online to be supplied along-with Instrument.
30. It must involve min 5 years warranty

Item Code: 84

BLOOD ANALYSER
(Automated Haematology Analyzer: 6 parts)

1. The instrument should be fully automated fluorescence flow cytometry based 6-part
2. Differential haematology analyser offering automatic start-up, shutdown and sample analysis.
3. The instrument should have random access discrete analysis modes for CBC CBC+DIFFERENTIAL+ IG.
4. The instrument should have 24 PARAMETERS reported, RBC, HGB, HCT, MCV, MCH, MCHC, RDW-SD, RDW-CV, PLT, NEUT %, LYMPH %, MONO %, EOS %, BASO %, NEUT #, LYMPH #, MONO #, EOS #, BASO #, PDW, MPV, PCT, P-LCR, IG #, IG %

TWO HISTOGRAMS – RBC, PLT and ONE SCATTERGRAM

5. The instrument should have throughput of at least 60 samples per hour in both the discrete analysis modes.

6. The sample aspiration volume for the complete differential blood count should not be more than 70 μl.

7. The instrument should have the following analysis modes, Manual – open & Capillary mode.

8. The instrument should have Hydrodynamic focusing / impedance method for RBC / PLT channel.

9. The instrument should have Cyanide free Sls-hb /colorimetric method for the haemoglobin measurement

10. The instrument should be equipped with Fluorescence based semiconductor laserfluorescence flow cytometry for Differential channel.

11. Instrument should be able to enumerate immature granulocytes

12. The instrument should have COMPREHENSIVE INFORMATION PROCESSING SYSTEM with:

13. User-friendly Windows 10 based software. 100000 sample data with histogram and scattergrams storage. 99 QC files each with 300 points for QC can be stored.

14. The instrument should have minimum maintenance with Semiconductor laser has lower power consumption, higher stability.

15. The instrument should be EXTENSIVE QC FEATURES: Min one file for X bar M.

16. Delta checks available for cumulative review. Option for online QC also available.

17. It should have high linearity of over 4 lacs for WBC’s, over 40 lacs for Platelets

18. Suitable online UPS to be supplied along-with instrument.

19. It must involve minimum 5 years warranty.

**Item Code: 85**

**MICROSCOPE**

(Binocular compound students’ microscope)

1. Body: Binocular, sturdy, stable base body with focus adjustment controls.

2. Eye piece: Paired, high quality, (the image of the object as seen through the binocular eyepiece should be well defined centrally in at least 2/3 field of view), achromatic, wide field, 10x with inbuilt pointer. The eyepiece should be aplanatic and have a minimum field number of 18 Dioptre adjustment must be present on one/ both eye pieces or on the eye piece tube

3. Optical system should be infinity corrected.

4. System complete with illumination system is required.

5. Objective: Three objectives10x, 40x, 100x. 10x and 40x objectives should have numerical apertures of 0.25 and 0.65 respectively and should be of spring-loaded type or otherwise.100x should have numerical aperture of 1.25 and should be of oil immersion and spring-loaded type. All objectives should be wide field, achromatic and parafocal.

6. Marking for the Objectives: Each objective should be engraved with the following information’s:- Name of the manufacturer → Magnification and numerical aperture, for example,10x/0.25 100x objective should be engraved with the word ‘Oil’ in changing from one objective to another or reintroducing the same objective by rotation of the nosepiece, the object at the centre of the field should not appear displaced by more than 0.02 mm in the object plane in any direction.

7. Nose piece: Revolving nose piece to accommodate a minimum of three objectives with click stops. It should be provided with ribbed grip for easy rotation mounted on a precision ball
bearing mechanism for smooth and accurate alignment. Extra ports if any should be fitted with dust proof metallic/ebonite caps.

8. Stage uniformly horizontal, mechanical stage having dimensions of length 140 mm (+/- 20mm) with fine vermier graduations (minimum reading accuracy of 0.1 mm). The stage should be provided with spring loaded slide holder for exact positioning of specimen / slide. It should be designed with convenient sub-stage vertical coaxial adjustment for slide manipulation. The stage should have ball-bearing arrangement to allow smooth travel in transverse directions i.e. 80 mm (+/- 5mm) and front to back direction, 50mm (+/- 5mm).

9. Sub-stage condenser: Abbe-type condenser, numerical aperture (N.A.) 1.25 focusable with rack and pinion arrangement incorporating a spherical lens and an iris-diaphragm. The condenser should have a filter holder and removable/ swing in/ out blue filter (suitable for bright field Microscopy).

10. Sub-stage illuminator: The system should have a build-in variable light source (Illuminator). This light source should have a 20 W, 6 V Halogen lamp. The circuitry for the light source should include a constant voltage supply. The system should be provided with a step-down transformer and an on-off switch and intensity control. The lamp should be provided with a lamp socket which has the facility for easy replacement of the bulb.

11. Power supply: Voltage 220 V AC, 50Hz. should have one on-off power switch, 3 core power cord with a 3 point male plug.

12. The system should have an inbuilt protective/ safety device to withstand fluctuations of voltage from 140 V to 280 V.

13. A plano-concave mirror in fork mounting should be supplied which would be attachable to the base for field use when power is not available.

14. The fuse for the halogen lamp should be easily accessible to the operator.

15. The Illuminator should have a build-in field diaphragm for Kohler illumination.

16. Eye piece tubes: Binocular eye piece tubes, inclined at 45 degrees, rotatable through an angle of 360 degrees, having inter-pupillary distance range of 54-74 mm or wider, covering the above-mentioned range.

17. Focusing knob: Co-axial coarse and fine focusing knobs capable of smooth fine focusing movement over the full range of coarse travel. The fine focusing movement should have sensitivity of two microns or less (finer) over the entire course focusing stop safety arrangement should be provided.

18. General: All optical parts including objectives, eye pieces and prisms should have anti-reflective coating which also gives anti-fungal property. All metallic parts should be corrosion-proof, acidproof and stain-proof. Working manual should be provided with each microscope. — A bottle of at least 25 ml immersion oil, a roll of lens tissue paper and lens cleaning solution (100 ml) should be provided with each microscope. One anti-static cleaning brush should be provided with each Microscope for cleaning purpose.

19. Microscope should be supplied with all spare parts including Fuses — 6 Nos.

20. All consumables required for installation and standardization of system and microscope cover to be given free of cost.

21. The unit shall be capable of being stored continuously in ambient temperature of 0 -50 deg C and relative humidity of 15-90%.

22. Should be FDA or CE or ISI approved product.

23. Warranty: Five Years and 5 years comprehensive AMC should be available with service centres in close proximity. Certificate of calibration and inspection from factory.

24. List of important spare parts and accessories with their part number and costing.
<table>
<thead>
<tr>
<th>Item No.</th>
<th>INSTRUMENTS</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>86</td>
<td>High End Research Stereozoom Microscope with high resolution, required zoom ratio, photographic software attachments with computer (Automatic operation)</td>
<td>optical system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Zoom Ratio</td>
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<tr>
<td></td>
<td></td>
<td>Zoom range</td>
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<td></td>
<td>Zoom System</td>
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<tr>
<td></td>
<td></td>
<td>Total Magnification</td>
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<td></td>
<td></td>
<td>Objectives</td>
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<td>Plano Apo</td>
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<td>Eyepieces</td>
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<td></td>
<td></td>
<td>Focus Unit</td>
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<td></td>
<td></td>
<td>Reflected</td>
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<tr>
<td></td>
<td></td>
<td>FOR MANUAL OPERATING MICROSCOPE</td>
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<tr>
<td></td>
<td></td>
<td>Magnification range: from 2.4x -575 xs with different combination of eye piece and objectives. Objective: Plan Apochromatic objectives 1X (WD 65mm or more) &amp; 1.5x (26 mm or better) Focus: Manual focusing drive with adjustable click stops Resolution: at least 345lp/mm &amp; 800lp/mm with exchangeable optics Illumination: LED transmitted fiber diascopic illumination optic cold light source 15V 150W halogen- up to 600lm light</td>
</tr>
<tr>
<td>---------------------------------------------</td>
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<td>---------------------------------------------</td>
</tr>
<tr>
<td>flux at 9mm optical output diam., continuous, Optical fiber reflected light source</td>
<td>Electronically dimming/ Halogen lighting will also can’t be ruled out.</td>
<td>LCD display, bulb 12/15V:120/150W halogen reflector, Goose-neck light guide Eyeypiece 10x FOV 23mm</td>
</tr>
<tr>
<td>Differential Global Positioning System (Real time Kinematics-GPS) with a work station</td>
<td>Multi-frequency, GPS / GLONASS / Galileo / BeiDou / QZSS / SBAS/ GAGAN, Smart Link fill / Smart Link, Tilt compensation, Static, Rapid Static kinematic, Real Time Kinematic mode, Raw data / RINEX data logging / NMEA out, RTK reference station functionality, Cellular / UHF Radio (receive &amp; transmit) modem, SD card storage, proof against water, sand and dust, mm accuracy (horizontal and vertical), Controller with touch screen, low light and day light readability. Processing software and accessories Work Station: Core i7, 16GB RAM, 3.4 GHz, 2TB Hard Disk, Windows 10, 4GB Graphics With WIFI, 27 inches screen.1 KV UPS</td>
<td></td>
</tr>
<tr>
<td>Research Petrographic microscope with photographic attachments with computer attachments with compatible automatic point counter</td>
<td>Coded 6-fold centerable nosepiece. Illumination and contrast management for reproducible results. Function keys for motorized aperture/field diaphragm Coded conoscopcy with 1.6x magnification changer. 5X, 10X, 20X, 40X, 50X Analyzer 180°, rotatable, revolving 180° with scale intervals of 5°. Stagemicrometer, reticule Tube optics 1X/1.6X, Bertrand lens and quartz plate with refracted and reflected light illumination LED automatic illumination Status display (magnification, resolution, depth, calibration etc) 360° rotating stage with and without 45°click stop. Motorized</td>
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<tr>
<td><strong>condenser with motorized top lens</strong></td>
<td>Strain-free optics Broad range of polarization equipment</td>
<td></td>
</tr>
<tr>
<td>Fixed and variable compensators according to DIN 58879</td>
<td>With manual point counting stage</td>
<td></td>
</tr>
<tr>
<td>Digital microscope cooled colour camera with CCD, fast live image 1280×960 pixel with 18fps</td>
<td>(Computers should be of a good brand not less than windows 10, intel i7 processor, 8 gb RAM, LCD monitor, 1KV UPS)</td>
<td></td>
</tr>
</tbody>
</table>

**Student Stereozoom microscopes with photographic attachments**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Body of Greenough design with interchangeable optics; Zoom ratio: 5:1 (or better)</td>
<td>10X eyepiece</td>
</tr>
<tr>
<td>working distance: should not be less than 110m</td>
<td>Magnification range: from 6X(minimum)- 60X (up to)</td>
</tr>
<tr>
<td>Zoom click stops: at least 5 (0.8X onwards)</td>
<td>Eyepiece: 10X, FOV 23 mm or better.</td>
</tr>
<tr>
<td>Height of base more than 25mm</td>
<td>LED Transillumination unit (only reflected)</td>
</tr>
<tr>
<td>Dust cover, LCD monitor camera attachments</td>
<td>Resolution at least 200lp/mm</td>
</tr>
</tbody>
</table>

**Drone with high resolution camera and GPS for terrain mapping along with data processing software and high-end computer**

<p>| | |</p>
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>High resolution camera, FOV: 70-80°, Aperture: f/2.8–f/11, Shooting Range: 1 m to ∞, Image: 5472×3648, 4K video, Omnidirectional Obstacle Sensing, High accuracy GPS, Hovering time more than 25 mins, Operating frequency: 2.4-5.8GHz, 3-axes stabilization, Wi-Fi, Internal storage, ± 0.1 to 0.5 m accuracy, Remote controller with a monitor/Tablet, data processing software, android/Mac supported and accessories</td>
<td>Computer for data processing: Xeon SILVER 4110 Processor, Windows 10, 1 KV UPS, 4.4 GHz per CPU, Graphics 6GB, 128 GB RAM, 2 TB, 27 inches Screen, Wi-Fi</td>
</tr>
</tbody>
</table>

**Petrographic student microscopes with point counter**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Automatic point counter with conoscopic and orthoscopic observation (For Ore and thin section) .360 ° rotatable-Analyser</td>
<td>Plan Achromatic Objectives starting minimum from 4X, Other objectives 10X, 20X and 40X</td>
</tr>
<tr>
<td>Compensator Lambda, Bertand lens, Wedge compensator. With best in class transmitted and reflected illumination system</td>
<td></td>
</tr>
</tbody>
</table>

**High end computers with large screen for satellite data interpretation**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Core i7, 16GB RAM, 3.4 GHz, 1TB Hard Disk, Windows 10, 2GB Graphics with Wi-Fi, 24 inches screen, 1 KV UPS</td>
<td></td>
</tr>
</tbody>
</table>

**Van Veen Grab**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless steel body, Collection of sediment samples from the lake/ocean bottom, Hingeaccess flaps with 0.045m sq weighing up to 12 kg (including ballast)</td>
<td></td>
</tr>
</tbody>
</table>

**High Precession Weighing machine**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>High precession weighing machine with analytical balance with arrange from 0.005 mg to 0.1 mg. (up to 6 decimal place) weighing pan that minimizes influence of air movements on weighing results</td>
<td></td>
</tr>
</tbody>
</table>

**Ultrasonic Bath**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless steel body, Cleaning of Geological samples, clot</td>
<td></td>
</tr>
</tbody>
</table>
samples, Capacity 2.5 litre or more.

| Item Code: 95 | Distil water Plant | High end glass equipment, Distilled water output at least 5 litre/hour, pH: 6.9-7, distillate temp: 65°-75° |

**Item Code: 96**

**HIGH PERFORMANCE COMPUTING FACILITY**

1. Log In Node – 1 Node

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Processor**                          | 2 × Intel® Xeon® Processor Scalable Silver 4000 Series  
Number of cores = 20  
Number of Threads = 40  
Processor Base Frequency=2.1GHz  
Cache = 16MB L3  
Memory Type= DDR4-2400  
Maximum Memory Speed= 2400MHz |
| **Memory**                             | RAM: 128GB ECC DDR4-2666 Mhz or better RAM. At least 16 DIMMs on motherboard |
| **Hard Disk Drives/Solid State Drives**| 4TB SAS×4 Numbers  
SPEED = 7.2K rpm  
TYPE = SAS,  
2 x 480GB SATA Enterprise Grade SSD – Endurance rating – 3DWPD |
| **HDD bays**                           | HDD bays supporting 8 or more SAS/SATA Hard drives and Solid-State Drives. On board NVMe controller and at least 2 dedicated NVMe drive bays or more out of total bays available. |
| **I/O slots (Peripheral Component Interconnect Express, PCIe)** | Minimum 2 × PCIe 3.0 slots must be vacant after populating Interconnect and RAID AOC. |
| **RAID Level support**                 | RAID 0,1,5,6; populated with 12Gbps SAS RAID controller with 2GB cache. With array configuration and management utilities, Independent of port auto-negotiation, optional battery backup unit for future upgrade. |
| **Graphics controller**                | Integrated Graphics with on board controller. |
| **Network interface**                  | At least 2 number of Gigabit ports on board. |
| **Ethernet ports**                     | 2 × 1 Gbps Ethernet Standard LAN ports, 2 x 10G LAN Ports.  
1 x 1 Gbps Ethernet LAN port x with Preboot Execution Environment (PXE) boot capability (including 2 x CAT6 cable for connecting to switches) |
| **Ports**                              | Minimum 2 USB 2.0 or higher and 1 graphics port |
| **Cluster Interconnect**               | 56 Gbps (or higher) Infiniband or Intel OPA with cable (same make as the IB/OPA switch). |
| Server management (Intelligent Platform Management Interface, IPMI) | ● IPMI 2.0 Support with KVM and Media over LAN features. Must include any licenses, if required for using these features.  
● It should be able to automate mgmt. tasks and automated firmware updates. |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supplies</td>
<td>Redundant (N+N) 80 Plus Platinum rated efficient power supply.</td>
</tr>
<tr>
<td>Cooling</td>
<td>Optimum no. of Cooling fans.</td>
</tr>
<tr>
<td>Operating System</td>
<td>Should support latest version of 64-bit CentOS. System must be Microsoft Windows and RHEL Certified</td>
</tr>
</tbody>
</table>
| Warranty | ● 5 years onsite warranty.  
● Physical on-site (Utkal University) visit by technical experts of Bidder for maintenance and technical support whenever needed on NBD Basis |
| Software Suites (Applications) | Open source/Commercial software suites to be loaded as part of the installation process by bidder. List will be provided by users |
| Form Factor | Rack Mount up to 2U or lesser. |

### 2. (CPU-CPU enabled Node)- TYPE – I

#### 20 Nodes

Technical specifications of each compute node:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>20 Nodes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specification</strong></td>
<td><strong>Description</strong></td>
</tr>
</tbody>
</table>
| Processor | 2 × Intel® Xeon® Processor Scalable Silver 4000 Series  
Number of cores = 20  
Number of Threads = 40  
Processor Base Frequency=2.1GHz  
Cache = 16MB L3  
Memory Type= DDR4-2400  
Maximum Memory Speed= 2400MHz |
| Memory | RAM: 128GB ECC DDR4-2666 Mhz or better RAM. At least 16 DIMMs on motherboard |
| Hard Disk Drives and SSDs | 1 x 480GB SATA Enterprise GRADE SSD (3 DWPD Endurance) |
| HDD bays | 3 HDD bays supporting HDDs or SSDs. |
| GPU Accelerator Support | None |
| I/O slots (Peripheral Component Interconnect Express, PCIe) | Minimum 1 × PCIe 3.0 slots vacant after populating Interconnect AOCs. |
| RAID Level support | RAID 0,1,10 level supported with RAID controller |
| Graphics controller | Integrated Graphics Controller |
| Network interface | At least 2 number of Gigabit ports on board. |
3. (GPU enabled Node): 2 Nodes
Technical specifications of each compute node:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>2 Nodes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specification</td>
<td>Description</td>
</tr>
<tr>
<td>Processor</td>
<td>2 × Intel® Xeon® Processor Scalable Gold 6000 Series</td>
</tr>
<tr>
<td>Number of cores</td>
<td>20</td>
</tr>
<tr>
<td>Number of Threads</td>
<td>40</td>
</tr>
<tr>
<td>Processor Base Frequency</td>
<td>2.4GHz</td>
</tr>
<tr>
<td>Cache</td>
<td>27.5MB L3</td>
</tr>
<tr>
<td>Memory Type</td>
<td>DDR4-2666</td>
</tr>
<tr>
<td>Maximum Memory Speed</td>
<td>2666 MHz</td>
</tr>
<tr>
<td>Memory</td>
<td>RAM: 128GB ECC DDR4-2666 Mhz or better RAM.</td>
</tr>
<tr>
<td>Hard Disk Drives/ Solid State Drives</td>
<td>1 x 960GB SATA Enterprise GRADE SSD (3 DWPD Endurance)</td>
</tr>
<tr>
<td>HDD bays</td>
<td>2 Hot Swap HDD bays supporting SAS/SATA HDDs or SSDs.</td>
</tr>
<tr>
<td><strong>GPU Accelerator</strong></td>
<td>For high performance parallel programming and computations: 1 x NVIDIA Tesla V100 GPU (32GB) cards. System must support at least 4 Tesla V100 (32GB) GPUs</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>I/O slots (Peripheral Component Interconnect Express, PCIe)</strong></td>
<td>Minimum 1 x PCIe 3.0 slots available for populating Interconnect HCA after populating all 4 x GPUs.</td>
</tr>
<tr>
<td><strong>RAID Level support</strong></td>
<td>RAID 0,1,10 level supported with offered RAID controller</td>
</tr>
<tr>
<td><strong>Graphics controller</strong></td>
<td>Integrated Graphics Controller</td>
</tr>
<tr>
<td><strong>Network interface</strong></td>
<td>At least 2 number of Gigabit ports on board.</td>
</tr>
<tr>
<td><strong>Ethernet ports</strong></td>
<td>- 2 x 1 Gbps Ethernet Standard LAN ports. 1 x 1 Gbps Ethernet LAN port x with Preboot Execution Environment (PXE) boot capability (including 2 x CAT6 cable for connecting to switches)</td>
</tr>
<tr>
<td><strong>Ports</strong></td>
<td>Minimum 2 USB 2.0 or higher and one port for graphics.</td>
</tr>
<tr>
<td><strong>Cluster Interconnect</strong></td>
<td>56 Gbps (or higher) Infiniband or Intel OPA with cable</td>
</tr>
</tbody>
</table>
| **Server management (Intelligent Platform Management Interface, IPMI)** | - IPMI 2.0 or equivalent Support with KVM and Media over LAN features. Must include any licenses, if required for using these features.  
- It should be able to automate mgmt. tasks and automated firmware updates. |
| **Power supplies** | Redundant N+N 80 Plus platinum rated efficient power supplies. |
| **Cooling** | Optimum no. of Cooling fans. |
| **Operating System** | Should support latest version of 64-bit CentOS. System must be Microsoft Windows and RHEL Certified |
| **Warranty** | - 5 years onsite warranty  
- Physical on-site visit by technical experts of Bidder for maintenance and technical support whenever needed on NBD Basis |
| **Software Suites** | Open source/Commercial software suites to be loaded as part of the installation process by bidder. List will be provided by users |
| **Form Factor** | - 1U Rack Mount or lesser. |

Note: Count of nodes may be increased depending on the total budget.

5. **PFS Storage System - 1 Set**

<table>
<thead>
<tr>
<th><strong>Features</strong></th>
<th><strong>Descriptions</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PFS Requirement</strong></td>
<td>Lustre based Parallel file system with 160TB usable space and with a performance of 2GB/s or higher (with linear upgrade in performance with future expansion). The performance needs to be demonstrated using third party benchmark (IOR/IOZone) with 1MB block size, and benchmark report for the solution proposed to be submitted with the bid. The solution must be designed with - Disks having redundant path to I/O server so that loss of one path doesn’t lead to point of failure. I/O server must be configured in failover to enable storage to recover from failure of one I/O server. Servers and storage must have redundant power supplies and must be connected to the HPC setup outlined in this tender using 56Gbps (or higher) low-latency interconnect (Mellanox EDR InfiniBand or Intel® Omni-Path). The solution must comprise of at least 2 I/O servers (acting as Metadata servers / Object Storage Servers) as below:</td>
</tr>
</tbody>
</table>
OST & MDT Specifications As below:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disks for OST</td>
<td>160TB or higher usable space with RAID6 or equivalent using SAS 7.2K RPM disks and with two hot-spare disks. All disks must be hot-pluggable and enterprise/data centre grade</td>
</tr>
<tr>
<td>Disks for MDT</td>
<td>4% or more of the PFS Usable Storage Space (OST) with RAID10/1E or equivalent using SAS 10K RPM disks and with one hot-spare disk. All disks must be hot-pluggable and enterprise/data centre grade</td>
</tr>
<tr>
<td>Connectivity</td>
<td>Connected to both the I/O Servers for high- availability configuration using 12Gbps (or higher) links</td>
</tr>
<tr>
<td>Form Factor</td>
<td>Rack-mountable with rail-kit.</td>
</tr>
<tr>
<td>Power Supplies</td>
<td>Hot-pluggable and N+N redundant, 80PLUS Platinum or better</td>
</tr>
<tr>
<td>Warranty</td>
<td>5 yrs onsite comprehensive warranty</td>
</tr>
</tbody>
</table>

I/O Nodes – Qty – 2 Nodes or more

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity</td>
<td>2 Nodes</td>
</tr>
<tr>
<td>Processor</td>
<td>2 × Intel® Xeon® Processor Scalable Silver 4000 Series</td>
</tr>
<tr>
<td></td>
<td>Number of cores = 20</td>
</tr>
<tr>
<td></td>
<td>Number of Threads = 40</td>
</tr>
<tr>
<td></td>
<td>Processor Base Frequency=2.1GHz</td>
</tr>
<tr>
<td></td>
<td>Cache = 16MB L3</td>
</tr>
<tr>
<td></td>
<td>Memory Type= DDR4-2400</td>
</tr>
<tr>
<td></td>
<td>Maximum Memory Speed= 2400MHz</td>
</tr>
<tr>
<td>Memory</td>
<td>RAM: 192GBECC DDR4-2666 Mhz or better RAM. At least 16 DIMMs on motherboard</td>
</tr>
<tr>
<td>Hard Disk Drives/Solid State Drives</td>
<td>2 x 480GB SATA Enterprise Grade SSD – Endurance rating – 3DWPD</td>
</tr>
<tr>
<td>HDD bays</td>
<td>HDD bays supporting 8 or more SAS/SATA Hard drives and Solid-State Drives. On board NVMe controller and at least 2 dedicated NVMe drive bays or more out of total bays available.</td>
</tr>
<tr>
<td>I/O slots (Peripheral Component Interconnect Express, PCIe)</td>
<td>Minimum 2 × PCIe 3.0 slots must be vacant after populating Interconnect and RAID AOC (if any)</td>
</tr>
<tr>
<td>RAID Level support</td>
<td>RAID 0,1,10 levels supported</td>
</tr>
<tr>
<td>Graphics controller</td>
<td>Integrated Graphics with on board controller.</td>
</tr>
<tr>
<td>Network interface</td>
<td>At least 2 number of Gigabit ports on board.</td>
</tr>
<tr>
<td>Ethernet ports</td>
<td>• 2 × 1 Gbps Ethernet Standard LAN ports, 2 x 10G LAN Ports.</td>
</tr>
<tr>
<td></td>
<td>• 1 x 1 Gbps Ethernet LAN port x with Preboot Execution Environment (PXE) boot capability (including 2 x CAT6 cable for connecting to switches)</td>
</tr>
<tr>
<td>Ports</td>
<td>Minimum 2 USB 2.0 or higher and 1 graphics port</td>
</tr>
</tbody>
</table>
Cluster Interconnect | 56 Gbps (or higher) Infiniband or Intel OPA with cable (same make as the IB/OPA switch).
---|---
Server management (Intelligent Platform Management Interface, IPMI) | • IPMI 2.0 Support with KVM and Media over LAN features. Must include any licenses, if required for using these features.  
• It should be able to automate mgmt. tasks and automated firmware updates.
---|---
Power supplies | Redundant (N+N) 80 Plus Platinum rated efficient power supply.
---|---
Cooling | Optimum no. of Cooling fans.
---|---
Operating System | Should support latest version of 64-bit CentOS.  
System must be Microsoft Windows and RHEL Certified
---|---
Form Factor | Rack Mount up to 2U or lesser.
---|---
Dehumidifier | Dehumidifier for server & computer rooms

4. Management and other S/W Stack

<table>
<thead>
<tr>
<th>SI No:</th>
<th>Items</th>
</tr>
</thead>
</table>
| I. | Commercial Licensed Management S/W:  
System management/monitoring tool set for configuration, diagnosis and management. Toolset/Manager must be capable of supporting package and image based provisioning, intuitive web interface for managing and customize the nodes, Nodes Manager tool set with provisioning, monitoring and reporting capabilities, Support for Customizing networks and compute node profiles, Capable of customizing compute to max, up to changing kernel parameter, And able to Push configuration changes and updates to the compute nodes. Product Datasheet must be provided with the bid with features and specifications listed. License must be issued in the name of Utkal University |
| II. | Batch/Job Schedulers and workload management:  
Open source based or commercial workload managers for batch job scheduling with policies to allow Pre-emptive and backfill scheduling, Job monitoring and management, policy aware, resource aware and topology aware scheduling, GPU aware scheduling, advance reservation support, Live reconfiguration capability. Must be able to support interactive jobs with debugging on a dedicated debug queue. |
| III. | Parallel Dev Environment Stack  
1. Latest open-source C/C++/Fortran compilers and debuggers  
2. Communication libs MPI/OpenMP/pthreads. |
| IV. | Intel® Parallel Studio XE Cluster Edition for Linux* - Named-user Academic for 3yrs – 1 Set |

5. Communication Network
1. Interconnect Switch -I 100% Non-blocking, Switching Fabric-56Gbps using IB or Intel OPA or proprietary low latency with embedded or host Subnet Manager for 36 devices or more and each switch(s) with redundant power supply/supplies. All cables required for connecting the devices quoted in this tender should be included/bundled. Switches having a non-blocking switching capacity of 7.2Tb/s or more

1. Interconnect Switch – II for Secondary Communication Layer 2 Gigabit Switches with rack mount kits to connect with 24 devices or more thru dedicated ports

1. Interconnect Switch – III (for Management) Layer 2 Gigabit Switches with rack mount kits to connect with 24 devices or more thru dedicated ports

6. Other Items

<table>
<thead>
<tr>
<th>SL No:</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>Rack mount 17-inch Display, Keyboard, Video and Mouse (KVM) Rackable Console with All accessories. Qty -1</td>
</tr>
<tr>
<td>II.</td>
<td>8 Port KVM over IP Switch (USB based) with all required Cables &amp; Accessories. Qty -1</td>
</tr>
</tbody>
</table>

7. Power Backup Solution:

<table>
<thead>
<tr>
<th>SL No:</th>
<th>Items-</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>Two UPS Units in Failover / Redundant Configuration (1+1). Each UPS of 20 KVA/18 KW should have the following features: True online double conversions, IGBT Rectifier &amp; inverter-based UPS. Three phases Input/ three phase output with SMF batteries Suitable for 30 Min backup on Full load at 0.9 Load P.f. using 42 Ah X 40 Battery with Each UPS, Input voltage range 340-478V at 100% load, 220-478 V @ 50% load. Input power factor 0.99. Battery Flexible design of 32 to 40 battery. Battery type should be Valve regulated lead-acid (VRLA) of make Exide/Panasonic/QUANTA/Rocket. Inbuilt Input Isolation Transformer is mandatory required, parallel communication port, RS232, USB, EPO and SNMP interface, BMS interface, Dust Filter at Air Inlet point are required. UPS should be provided with environment monitoring probe to measure temperature and humidity of UPS room. LCD Display indicating all important parameters. SNMP software should be compatible to Window 10. UPS software should be compatible to Google Chrome, Mozilla Firefox and Microsoft Internet explorer. Battery open rack, battery interlinks battery breaker, battery to UPS cable as required should be provided with UPS systems. UPS warranty: 5 Year, Battery warranty – at least 3 Years Battery Approved Make: Quanta / Exide / Rocket / Panasonic</td>
</tr>
</tbody>
</table>

8. Cooling Solution:

<table>
<thead>
<tr>
<th>SL No:</th>
<th>Items-</th>
</tr>
</thead>
</table>
I. Cooling Solution Specifications as below:

i. The Data Centre to be provided with the appropriate Inbuilt/self-contained cooling system-based racks. The inbuilt/self-contained intelligent rack-based cooling system will be able to remove high level of waste heat from server enclosures/rack and to provide uniform, & effective cooling for servers and similar IT equipment (switches etc.) installed within racks as offered by bidder, it will be provided with appropriate refrigerant.

i. Total IT Load to be taken care of 15 KW, Cooling solution must provide redundant solution to take care 15 KW IT Load, with redundant cooling units available in the solution offered (N+N) redundant. Each Unit capable to take care of 15 KW IT Load.

i. Outdoor Cooling Units (if any) will be positioned outside the server room. Bidders can visit the facility for better understanding before supply.

i. Solution must comprise 32 A, Rack mount, vertical PDU with a combination of IEC C-13 and IEC C-19 sockets according to the IT equipment

i. Front door with biometric access, rear door lock, smoke detection system with indicators, rodent control system, Environmental Monitoring System, Automatic Front Door Opening System, Fire Suppression System & Detection Sensor, Hooter/Sensor available for alarm purpose in case of any malfunctioning, Touch Screen Front Panel Monitoring, IP Via Modbus enabled, double glass or toughened glass front panel

**Computer Software and Instruments:**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MATLAB with all module (20 users)</td>
</tr>
<tr>
<td>2</td>
<td>Mathematica (5 users)</td>
</tr>
<tr>
<td>3</td>
<td>IDL</td>
</tr>
<tr>
<td>4</td>
<td>MAPLE (single user)</td>
</tr>
<tr>
<td>5</td>
<td>Gaussian (Revision) for Linda</td>
</tr>
<tr>
<td>6</td>
<td>Materials Studio with all module</td>
</tr>
<tr>
<td>7</td>
<td>VASP (DFT Package)</td>
</tr>
<tr>
<td>8</td>
<td>Turbomole</td>
</tr>
<tr>
<td>9</td>
<td>ChemShell</td>
</tr>
<tr>
<td>10</td>
<td>SPSS Software</td>
</tr>
</tbody>
</table>

9. SERVICE ENGINEERING SUPPORT TO BE PROVIDED BY THE SUPPLIER

1. Service Engineer Support: Service Engineering Support well verse with Linux operations/commands and capable to take care of the HPC Infrastructure facility is to be provided. On Next business day support basis Any cost related to the same must be borne by the Bidder.

10. Supply, Installation and In-house training: -
● Before acceptance and installation of any item, the quality, specification and quantity will be
verified by Utkal University.
● Installation of items part of this tender will have to carried out by the vendor/bidder. Any
specific requirement of vendor regarding installation of above-mentioned items must be
mentioned in the technical bid so that Utkal University can provide the resources for the same.
● 2-day in-house training by Certified Professionals at Utkal University including installation of
software, bench-marking HPL, Management etc. must be conducted by Bidder. Any charges
applicable for

**Qualification Criteria:**

1. Server OEM must be listed in at least 3 Lists of Top 500.org lists during the last 3 years
2. Server OEM must be listed in at least 3 Lists of India Top 100 Supercomputers lists during the
last 3 years (which was earlier maintained by IISC and now by C-DAC)
3. Storage OEM must have installed at least 2 PFS based storage systems of 50 or more TB in size
as part of HPC in India at Govt. Education & Research Organisations. Documentary proof (PO
and installation reports must be submitted with bids) during the last 5 years.
4. One OEM (Server OEM) can authorize only one SI/Bidder to quote their products.
5. The bidder must be registered under the Companies Act 1956 or a registered firm. And have
registered office in India.
6. On Site support to be provided by the Bidder or the OEM. Declaration to be submitted along
with the bid.
7. Bidder must not be blacklisted by any Govt. organisation in India; a notarised declaration must
be submitted with the bid.
8. Valid and Duly Authorized Manufacturer Authorization Certificate from the respective OEMs
(Server, Storage, and Switch) in the name of Participating System Integrator/Bidder must be
submitted at the time of submission of Bids. From Server, Storage, and Switch OEMs.

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Equipment Name and specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>97.</strong></td>
<td>Projection based Fabry-Perot Interferometers (imported experimental set-up)</td>
</tr>
<tr>
<td></td>
<td>● To find the wavelength of monochromatic light</td>
</tr>
<tr>
<td></td>
<td>● To determine the spacing between the plates of fabryperot etalon from the fringe Pattern</td>
</tr>
<tr>
<td></td>
<td>● To find the finesse and free spectral range (FSR) of etalon from the fringe calibration at different cavity thickness</td>
</tr>
<tr>
<td><strong>98.</strong></td>
<td>Michelson Interferometer (imported experimental set-up) for</td>
</tr>
<tr>
<td></td>
<td>● Determining the wavelength of the light of an He-Ne laser</td>
</tr>
<tr>
<td></td>
<td>● Determination of the coherence time and the line width of spectral lines</td>
</tr>
<tr>
<td></td>
<td>● Investigation of the pressure induced line broadening</td>
</tr>
<tr>
<td></td>
<td>● Determination of the line splitting of two spectral lines</td>
</tr>
<tr>
<td><strong>99.</strong></td>
<td>Rydberg constant experimental set-up for measurement of the Rydberg constant</td>
</tr>
<tr>
<td><strong>100.</strong></td>
<td>Babinet’s compensator (imported experimental set-up)</td>
</tr>
<tr>
<td></td>
<td>● To calibrate the Babinet compensator with monochromatic light.</td>
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<tr>
<td></td>
<td>● Measurement of the sample birefringence</td>
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<td><strong>101.</strong></td>
<td>Constant deviation spectroscope (imported experimental set-up)</td>
</tr>
<tr>
<td></td>
<td>● To measure the wavelength of absorption bands</td>
</tr>
<tr>
<td></td>
<td>● To find the wavelength of prominent lines of the emission spectra</td>
</tr>
<tr>
<td><strong>102.</strong></td>
<td>Braun tube experimental set-up for measurement of e/m ratio (imported experimental set-up)</td>
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</table>
| **103.**  | “Thomson Method” apparatus for the measurement of e/m ratio (imported...
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<th>Description</th>
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<tr>
<td>104.</td>
<td>Experimental set-up for magnetic field measurement by search coil</td>
</tr>
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<td>105.</td>
<td>Rectification by junction Diode using various filters to study the low, high and band pass filter</td>
</tr>
<tr>
<td>106.</td>
<td>Characteristics of a Transistor: To study the I-V characteristics in CB, CE mode</td>
</tr>
<tr>
<td>107.</td>
<td>Experimental set-up to study Richardson’s T $^{3/2}$ law</td>
</tr>
<tr>
<td>108.</td>
<td>Experimental set-up for the determination of Planck's constant by total Radiation Method (imported experimental set-up)</td>
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</tbody>
</table>
| 109. | B-H curve apparatus  
  - To study hysteresis loop.  
  - To study permeability curve to study the magnetic behaviour of a material. |
| 110. | Millikan’s oil drops experimental set-up (imported experimental set-up) to determine the charge of an electron and quantum nature of electric charge |
| 111. | Measurement of attenuation and phase shift of A.C. in L.C.R. network KIT |
| 112. | Experimental set-up to study the characteristics of RF coil |
| 113. | Frank Hertz experiment apparatus (imported experimental set-up)  
  - To measure the excitation potential of Argon using the Franck-Hertz method  
  - To verify that atomic systems have discrete energy levels by bombarding electrons and observing the difference in energy levels |
| 114. | Dielectric Constant measurement KIT for non-aqueous liquids and solids |
| 115. | Fourier Analysis KIT  
  - To analyse complex wave (square, clipped sine wave, triangular wave). |
| 116. | Study of Operational Amplifier, Study of Multivibrators  
  - To study the adder, subtraction, Integrator, Differentiator in inverting and non-inverting mode  
  - To study the non-sinusoidal square wave signal (in astable, stable) |
| 117. | Dielectric LCR Tester with temperature variation  
  - To measure the dielectric constant of the material |
| 118. | Hall effect Apparatus (imported experimental set-up)  
  - To determine Hall Voltage (p or n type).  
  - To determine Hall Coefficient.  
  - To determine the type of Charge carrier.  
  - To determine Charge Density of carriers.  
  - To determine the Resistivity of a given sample.  
  - To determine the mobility of charge carriers.  
  - To determine the Hall angle. |
<p>| 119. | Gouy-Balance apparatus to measure the magnetic susceptibility |
| 120. | Determination of absorption coefficient of Aluminium using GM Counter (2nos.) (imported experimental set-up) |
| 121. | Characteristics of G. M. counter (3 nos.) (imported experimental set-up) |
| 122. | Determination of the thermal conductivity of building materials using the single plate method KIT |
| 123. | Determination of the specific vaporization heat of water KIT |
| 124. | Kerr Effect Apparatus for investigating the Kerr effect in Nitrobenzene (imported experimental set-up) |</p>
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<tr>
<th>No.</th>
<th>Description</th>
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<tr>
<td>125.</td>
<td>Prism Spectrometer (imported experimental set-up) for measuring the line spectra of inert gases and metal vapours</td>
</tr>
<tr>
<td>126.</td>
<td>Solid State laser for the study of the properties of laser diode, i.e. the characteristic parameters like the output power and wavelength as a function of the temperature.</td>
</tr>
</tbody>
</table>
| 127. | Planck's constant apparatus for  
- Determining Planck's constant  
- Selection of wavelengths using interference filters on the optical bench. |
| 128. | Balmer series of Hydrogen Apparatus (imported experimental set-up) for observing the splitting of the Balmer series on deuterated Hydrogen (isotope splitting) |
| 129. | Normal Zeeman Effect Apparatus (imported experimental set-up)  
- Observing the normal Zeeman effect in transverse and longitudinal configuration - spectroscopy using a Fabry-Perot etalon  
- Measuring the Zeeman splitting of the red cadmium line as a function of the magnetic field - spectroscopy using a Fabry-Perot etalon |
| 130. | Anomalous Zeeman effect Apparatus (imported experimental set-up)  
- observing the relaxation signal  
- measuring and observing the Zeeman transitions in the ground states of Rb-87 with s + - and s - pumped light  
- measuring and observing the Zeeman transitions in the ground states of Rb-87 as a function of the magnetic flux density B  
- measuring and observing the Zeeman transitions in the ground states of Rb-85 as a function of the magnetic flux density B  
- measuring and observing two-quantum transition |
| 131. | Rutherford Scattering experimental set-up (imported experimental set-up) for measuring the scattering rate as a function of the scattering angle and the atomic number |
| 132. | Polarization of light by half-wave plate (imported experimental set-up)  
- To measure the light intensity of plane polarised light as a function of the analyser position.  
- To study the polarization of light by half wave plate.  
- To verify the inverse square law.  
- To verify Malus-law. |
| 133. | Polarization of light by quarter-wave plate (imported experimental set-up)  
- To Measure the light intensity of plane polarised light as a function of the analyser position.  
- To study the polarization of light by quarter wave plate.  
- To study the polarization of light by two quarter wave plate.  
- To verify the inverse square law.  
- To verify Malus-law. |
| 134. | Biot-Savart's Law Apparatus (imported experimental set-up)  
- To study Biot-Savart’s law.  
- To study the magnetic field along the axis of a current carrying circular loop.  
- To study the dependence of magnetic field on coil diameter. |
| 135. | **Gamma Spectroscopy and Compton effect (2 nos.)** (imported experimental set-up)  
Nimbin with power supply with 42 pin/nim connectors (3 nos), Single channel Analyser with 42 pin/nim connectors (3 nos), Linear Amplifier (3 nos). |
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>136.</td>
<td>Muon Lifetime measurement with NaI detector and electronics (imported experimental set-up)</td>
</tr>
<tr>
<td>137.</td>
<td>Cathode Ray Oscilloscope (CRO) of frequency range 15-25 MHz Quantity: 10 numbers.</td>
</tr>
<tr>
<td>138.</td>
<td>Faraday effect Apparatus to determine Verdet’s constant for flint glass as a function of the wavelength</td>
</tr>
<tr>
<td>139.</td>
<td>Grating spectrometer for measuring transmission curves and spectral lines (imported experimental set-up)</td>
</tr>
</tbody>
</table>
| 140. | Compton effect at X-rays (imported experimental set-up) for  
  - verifying the energy loss of the scattered X-ray quantum  
  - Measurement of the energy of the scattered photons as a function of the scattering angle |
| 141. | Physical Properties Measurement System (PPMS)  
   DynaCool – 14T Cryogen Free PPMS Base system with a Longitudinal Magnet & Power Supply, with good quality Water Chiller, DynaCool - Vibrating Sample Magnetometer (VSM), Specification (Temp 1.8K-400K), DynaCool Heat Capacity Measurement (Temp 1.8K-400K). DynaCool Thermal Transport Option (TTO), DynaCool Electrical Transport Option (ETO). |
| 142. | Impedance Analyser for Research (Dielectric Measurement for both thin film and pallet samples)  
   Frequency: 20Hz - 20 MHz, with Temperature variation low to high temperature and all required software. |
| 143. | Upgradation of the existing XRD (Bruker D8 Advance)  
   1. X-ray tube Cu-Kα  
   2. Compact Cradle for multiple sample measurement  
   3. Multichannel detector for fast data acquisition with accessories to replace NaI single point detector  
   4. Upgradation of the Bruker D8 advance glancing angle x-ray measurement |

**Item Code 144**  
**CAMERA 1**  
Professional Camera Body (DSLR) with minimum - 20 – 30 MP Full Frame Sensor, High end Processor, High ISO Range 51000, 4K Shooting @60fps + Full HD Video Recording @120fps, 4K shooting, Dust & Drip Resistant, GPS, Wi-Fi-NFC.

**Item Code 145**  
**CAMERA 2**
Professional Camera Body (DSLR) – 25 – 40 MP Full-Frame Mirror less Sensor, High end Processor, High ISO Range, 4K shooting capability, UHD Video @30fps, Full HD Video Recording @60fps, HD Video at up to 120fps, Dust & Drip Resistant, Wi-Fi & Bluetooth, GPS, Wi-Fi-NFC.

Item Code 146
CAMERA 3
Professional Camera Body (DSLR) with minimum - 20 – 30 MP APC-C size Sensor, High end Processor, High ISO range, Wi-Fi, GPS.

Item Code 147
CAMERA 4
Camera Body (DSLR-Mirrorless) with minimum - 20 – 30 MP APC-C size Sensor, High end Processor, High ISO range, Wi-Fi, GPS.

Item Code 148
CAMERA 5
Professional Video Camera.

Item Code 149
DSLR / MIRRORLESS COMBO KITS
Details be mentioned about the type of body and lens.

Item Code 150
CAMERA LENSES
Professional Lenses and consumer lens of the following focal length.
16mm – 35mm – f 2.8.
24mm – 70mm – f 2.8.
24mm – 105mm – f 4.
100mm – f 2.8.
50mm – f 1.8.
70mm – 200mm – f 2.8.
100mm – 400mm – f 4.5.

Item Code 151
CAMERA ACCESSORIES
Memory Card, Professional Flash Gun, Professional Camera Stand with head (load bearing capacity 8 to 10 Kg.), Camera Bag, Professional External Hard Disk

Item Code 152
DRY BOX
Capacity 120 - 200 litres. (Good Quality)

Item Code 153
PROFESSIONAL QUALITY DIGITAL AUDIO RECORDING INSTRUMENT

Item Code 154
RFID IN PARIJA LIBRARY

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<th>Item No. 154.1: Library Staff Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item Minimum Specifications</td>
</tr>
<tr>
<td>Read/Write/Anti-theft programming should be done in one single operation</td>
</tr>
</tbody>
</table>
Read/Write distance of Up to 25 cm and programming time of 1 second
Should be fully ISO/IEC 14443A, 15693 and ISO 18000:3 compliant
The programming station should interface with the Library Management Software using NCIP V2.0 protocol
Integrated with reader for patron ID Card based ISO/IEC 14443A Mifare Plus to read for circulation
Integrated with reader for patron ID Card based ISO/IEC 14443A Mifare Plus for personalization of data into the ISO/IEC 14443A Mifare Plus passive contact less 1Kb smart card in the pre-defined location in the memory. The details of memory location in smart card will be provided at appropriate time
NCIP V2.0 compliance software interface integrated with integrated library management software for all operations like patron card personalization, check-in, check-out, renew, reserve etc of library circulation

<table>
<thead>
<tr>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parameter</strong></td>
</tr>
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<tr>
<td>Power Supply</td>
</tr>
<tr>
<td>Power Consumption</td>
</tr>
<tr>
<td>Transmitting Power</td>
</tr>
<tr>
<td>Read Range</td>
</tr>
<tr>
<td>Antenna</td>
</tr>
<tr>
<td>Communication Interface</td>
</tr>
<tr>
<td>Supported Transponders</td>
</tr>
<tr>
<td>Indicators</td>
</tr>
<tr>
<td>Operating Temperature</td>
</tr>
<tr>
<td>Housing Material</td>
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</tbody>
</table>

**Item No. 154.2: RFID Handheld Portable Reader**

**Item Minimum Specifications**

The portable handheld reader (Wand) and the required accessories must be a cordless, one-piece design, to be held in one hand.

The portable handheld reader must feature sound battery backup.

The total weight of the portable handheld reader must be less than 1 Kg., including battery, RFID reader, antenna and computing unit, and any other components that must be carried by the user.

The portable handheld reader must be easily set down on a library shelf or cart when necessary to free the user’s hands.

The portable handheld reader must incorporate an ergonomic design, to aid user in reading shelves at all levels easy to use and be relatively non-stressful to wrist, arm, shoulder and elbow.

The portable handheld reader battery life must allow the user to work for at least 4 hours before recharging.

The portable handheld reader must use an anti-collision algorithm that does not limit the number of tags, which can be simultaneously identified and read.

The portable handheld reader must have the capacity to download at least 1 million items from library’s automation system onto the portable handheld reader memory medium.

The proposed portable handheld reader must accommodate data collection simultaneously with other functions.

The proposed system must accommodate Sorting, Shelving, Searching, finding of library documents and pulling the defined data to help the user.
The proposed portable handheld reader must have an audible tone and visible indicators to verify item has been identified.

The handheld reader should include memory of at least 4GB.

<table>
<thead>
<tr>
<th>Specifications</th>
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<tbody>
<tr>
<td>Parameter</td>
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<td>Operating Frequency</td>
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<td>Power Supply</td>
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<tr>
<td>Standby Mode (battery life)</td>
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<tr>
<td>Charging Time</td>
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<td>Transmitting Power</td>
</tr>
<tr>
<td>Read Range</td>
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<tr>
<td>Communication Interface</td>
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<tr>
<td>Supported Transponders</td>
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<tr>
<td>Indicators</td>
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<tr>
<td>Operating Temperature</td>
</tr>
<tr>
<td>Storage Memory</td>
</tr>
<tr>
<td>Housing Material</td>
</tr>
</tbody>
</table>

**Item No. 154.3: Two EAS Pedestals Library Security Gate**

**Item Minimum Specifications**

Security gate should include two theft detection pedestals, which are interdependent of each other and also have an overlapping protection zones providing additional security. It is planned to install these pedestals at a single location in the library. The system should have suitable number of I/O ports for Standard electronic counter, web cam trigger, CCTV, locking gates etc. The offer must be complete in all respects with CCTV integration and must include all the components required for the functional of the system Library security gate. It should also have multi line infrared motion sensors to detect library foot falls and in-out numbers.

<table>
<thead>
<tr>
<th>Specifications</th>
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</thead>
<tbody>
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<td>Parameter</td>
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<tr>
<td>Operating Frequency</td>
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<tr>
<td>Power Supply</td>
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<tr>
<td>Power consumption</td>
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<tr>
<td>Transmitting Power</td>
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<tr>
<td>Read Range</td>
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<tr>
<td>Communication Interface</td>
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<tr>
<td>Supported Transponders</td>
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<tr>
<td>Operating Temperature</td>
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<tr>
<td>Communication Parameters</td>
</tr>
<tr>
<td>Weight</td>
</tr>
<tr>
<td>Housing Material</td>
</tr>
</tbody>
</table>

**Item No. 154.4: Self Check Out Kiosk Station**

**Item Minimum Specifications**

RFID Reader and Antenna with multiple Read/Write facility

Kiosk should suit the library decor

High Speed Thermal Slip Printer
17” or higher LCD/LED Touch Screen Monitor using Capacitive Technology  
Branded Small Form Factor CPU  
Multi-protocol firmware ISO/IEC 14443A, 15693 and ISO 18000:3 compliant  
Communication interface — Ethernet  
The Self-Checkout station client software should interface with the ILMS Software giving following features:  
◦ Check out / Renewal  
◦ Transaction Status  
◦ Transaction Printout  
Provision for display of reservations done by a user along with sequence and date of collection,  
Provision of enquiry of checkouts against a user and its due date.  
Provision for enquiry of fine against a user,  

<table>
<thead>
<tr>
<th>Specifications</th>
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</thead>
<tbody>
<tr>
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<td>Operating Frequency</td>
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<tr>
<td>Power Supply</td>
</tr>
<tr>
<td>Power Consumption</td>
</tr>
<tr>
<td>Transmitting Power</td>
</tr>
<tr>
<td>Read Range</td>
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<tr>
<td>Antenna Size</td>
</tr>
<tr>
<td>Communication Interface</td>
</tr>
<tr>
<td>Supported Transponders</td>
</tr>
<tr>
<td>Operating Temperature</td>
</tr>
<tr>
<td>Weight</td>
</tr>
<tr>
<td>Packaging Material</td>
</tr>
<tr>
<td>Display</td>
</tr>
</tbody>
</table>

**Item No. 154.5: RFID Book Return Station**

**Item Minimum Specifications**  
24 hrs operation should be possible  
Minimum 100 books bin to be provided  
Real time check in should be processed  
High Speed Thermal Slip Printer  
17” or higher LCD/LED Touch Screen Monitor using Capacitive Technology  
Small Form Factor CPU  

**Item No. 154.6: Smart Cards**

**Item Minimum Specifications**  
The smart cards should be 1kb Mifare Plus cards with pre-printing on both sides (pre-printing to be approved by Department)  
The smart card must be for multipurpose use by the library users.  
1k byte EEPROM  
Unique serial number  
16 securely separated sectors supporting multi-application  
Each sector consists 4 blocks with a length of 16 Byte  
2 x 48-bit keys per sector for key hierarchy  
Access conditions free configurable based on 2 level key hierarchy  
Number of single write operations: 100,000  

**Item No. 154.7: Self Adhesive RFID Tags (for Book)**
**Item Minimum Specifications**

The RFID chip used in the tag should have been designed specifically for Library use. i.e. it should have three sections
- Lockable section for item identification
- Re-writable section for library specific use
- Security function (EAS) for item anti-theft (which can be activated and deactivated),
- The RFID chip should have multi read function, i.e. several tags can be read at the same time

Tag size should be 80mm x 50mm with at least 2048 bits memory, multi-read and antitheft

Distance for detection from pedestal should be minimum of 92 cms

Tags should be fully ISO 15693/18000-3 compliant

Other features: "Tag Talks First" (TTF) feature, tamper proof, detection rate of the system should be above 95% consistently regardless of the number of items that are in the field

Warranty of Tags Minimum 40 years for logic circuits and replacement of defective tags if found during first time tagging

**Mechanical Dimension**
- Transponder coil size 80X50 mm ± 0.5mm
- Transponder die-cut size 80 x 50 mm 0.2 mm
- Thickness of the IC 150 micrometre ± 10%
- Overall thickness of transponder package (excluding IC and siliconized paper) 200 micro meter ± 10%
- Thickness of the siliconized wafer 56 micro meter

**Electrical characteristics**
- Integrated Circuit (IC) Philips i-Code-SLI X.
- ICS protocol /anti-collision ISO 15693/18000-3
- Operating frequency 13.56 MHz
- Unloaded resonance frequency 14.15 MHz ±0.30 MHz
- Memory 2048 bits R/W EEPROM

**General characteristics of transponder**
- Operating temperature (electronics parts): -20°C to *85°C
- ESD voltage immunity +12 kV peak. HBM
- Bending diameter (D) > 50 mm. tension less than 10 N
- Static pressure (P) < 10 MPa (10 N/mm2)

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### Item No. 154.8: Institution Labels

**Item Minimum Specifications**

| Good quality self-adhesive labels of following specification: |
| Good quality smooth face |
| Label printed with Name and logo (design to be approved by Department) |
| Size: Minimum half inch larger on all sides than the RFID tag |
| Strong permanent adhesive, which does not leach in to the paper of the book |

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### Item No. 154.9: Integration Module / Middleware Features

**Item Minimum Specifications**

Client Software should support following features and is to be Integrated with existing Integrated Library Management Software (ILMS)

- Tagging / Re-tagging after proper online validation of the title / member records LMS database
- Tag monitoring by accessing item record from ILMS database
- Patron Smart Card personalization monitoring by accessing patron ID from ILMS database
- Send SMS & Email for circulations and registration transaction which can be selected for
specific users.
NCIP V2.0 compliance
Retagging option for re-registration of books & patrons
Sorting by accessing Title record from ILMS
Check out /Check-in/Renewal
Provision tot display of reservations done by a member along with sequence and date of collection
Provision of enquiry of checkouts against a member and its due date
Provision for details of fine against a member
Provision of slip printing containing the details of a transaction
Reserved titles shall get highlighted while check-in
Designing of Library web page for providing various services through internet, including WebOPEC and giving link to information website.

<table>
<thead>
<tr>
<th>Item No. 154.10: RFID Tagging Job Work (for Book)</th>
<th>Item Minimum Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>RFID Tag &amp; Sticker to be pasted in same process</td>
<td>ISO 28560 standard followed for tagging</td>
</tr>
<tr>
<td>Minimum 2000 books to be completed in a day</td>
<td>Registration of books / DVDs to be done in single process</td>
</tr>
<tr>
<td>Data validation / editing required for Classification, Preparation of Subject Heading, Data entry in MARC21 format, Verification etc Including Retrieving the Book from the shelf and returning the same to the Specific shelf after processing as per Library standards for all Book entries.</td>
<td></td>
</tr>
<tr>
<td>To paste spine label where ever found missing</td>
<td></td>
</tr>
</tbody>
</table>

**Item Code: 155**
BOOK CLEANING MACHINE

**Item Code: 156**
INTERACTIVE PROJECTOR

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projection System</td>
<td>3LCD Technology</td>
</tr>
<tr>
<td>LCD Panel</td>
<td>0.67 inch with MLA (D10)</td>
</tr>
<tr>
<td>Colour Light Output</td>
<td>4,000 lumen- 2,800 lumen (economy) In accordance with IDMS15.4</td>
</tr>
<tr>
<td>White Light Output</td>
<td>4,000 lumen - 2,800 lumen (economy) In accordance with ISO 21118:2012</td>
</tr>
<tr>
<td>Resolution</td>
<td>WUXGA, 1920 x 1200, 16:10</td>
</tr>
<tr>
<td>Contrast Ratio</td>
<td>2,500,000: 1</td>
</tr>
<tr>
<td>Keystone Correction</td>
<td>Manual vertical: ± 3 °, Manual horizontal ± 3 °</td>
</tr>
<tr>
<td>Colour Reproduction</td>
<td>Up to 1.07 billion colours</td>
</tr>
</tbody>
</table>
**CONNECTIVITY**

- USB Display Function 3 in 1: Image / Mouse / Sound Interfaces
- USB 2.0 Type A (2x), USB 2.0 Type B, RS-232C, Ethernet interface (100 Base-TX / 10 Base-T), Wireless LAN IEEE 802.11b/g/n, VGA in, VGA out, HDMI in (2x), S-Video in, MHL, Stereo mini jack audio in, Stereo mini jack audio in (2x), Microphone input, Finger-touch interface, Sync. in, Sync. out, Miracast, Remote Desktop Connection, USB Interface for keyboard, DVI out (whiteboard)

**Security**

- Kensington lock, Control panel lock, Password lock, Padlock, Security cable hole, Wireless LAN unit lock, Wireless LAN security, Password protection

**Features**


**Video Colour Modes**

- Blackboard, Dynamic, Photo, Presentation, sRGB, Whiteboard

**Energy**

- Use 448 W, 332 W (economy), 2 W (standby)

**Product dimensions**

- 494 x 437 x 172 mm (Width x Depth x Height)

**Product weight**

- 11.4 kg

**Noise Level**

- Normal: 38 dB (A) - Economy: 27 dB (A)

**Warranty**

- Five Years On-site service

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**Item Code: 157**

**AIR-CONDITIONER I**

Inverter Air-Conditioner (split) with copper coil - 2 ton and branded stabilizer

**Item Code: 158**

**AIR-CONDITIONER II**

Inverter Air-Conditioner (split) with copper coil - 1.5 ton and branded stabiliser

**Item Code: 159**

**DESKTOP COMPUTER i3**

<table>
<thead>
<tr>
<th>Processor Make</th>
<th>INTEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor Generation</td>
<td>8TH</td>
</tr>
<tr>
<td><strong>Processor</strong></td>
<td>Corei3 8100</td>
</tr>
<tr>
<td>Chipset</td>
<td>Intel H370</td>
</tr>
<tr>
<td>Graphics Type</td>
<td>INTEGRATED</td>
</tr>
<tr>
<td>Graphics</td>
<td>Intel HD</td>
</tr>
<tr>
<td>Operating System (Pre-Loaded)</td>
<td>Windows 10</td>
</tr>
<tr>
<td>Hard Disk</td>
<td>1000 GB HDD 7200 RPM</td>
</tr>
<tr>
<td>Type of RAM</td>
<td>DDR 4</td>
</tr>
<tr>
<td>Feature</td>
<td>Specification</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------------------------------------------</td>
</tr>
<tr>
<td>RAM Speed</td>
<td>2400</td>
</tr>
<tr>
<td>RAM Size</td>
<td>4 GB</td>
</tr>
<tr>
<td>RAM Expandability</td>
<td>32</td>
</tr>
<tr>
<td>DIMM Slots</td>
<td>2</td>
</tr>
<tr>
<td>Internal Bays</td>
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<td>External Bays</td>
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<tr>
<td>Optical Drive</td>
<td>DVD R/W</td>
</tr>
<tr>
<td>Cabinet</td>
<td>TOWER</td>
</tr>
<tr>
<td>Cabinet Volume</td>
<td>less than 16 L</td>
</tr>
<tr>
<td>Network Connectivity</td>
<td>10/100/1000 on board Integrated Gigabit Port &amp; Integrated Wi-Fi</td>
</tr>
<tr>
<td>Expansion Slots (PCI)</td>
<td>1</td>
</tr>
<tr>
<td>Expansion Slots (PCIe x 1)</td>
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</tr>
<tr>
<td>Expansion Slots (PCIe x 16)</td>
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</tr>
<tr>
<td>USB Port 2.0</td>
<td>4</td>
</tr>
<tr>
<td>USB Port 3.1 Gen 1</td>
<td>4</td>
</tr>
<tr>
<td>Serial Port</td>
<td>Yes</td>
</tr>
<tr>
<td>VGA</td>
<td>YES</td>
</tr>
<tr>
<td>HDMI</td>
<td>Yes</td>
</tr>
<tr>
<td>Monitor Size</td>
<td>19.5 IPS</td>
</tr>
<tr>
<td>Monitor Resolution</td>
<td>1440 X 900</td>
</tr>
<tr>
<td>Monitor Certification</td>
<td>TCO 7</td>
</tr>
<tr>
<td>Keyboard</td>
<td>STANDARD</td>
</tr>
<tr>
<td>Mouse</td>
<td>OPTICAL</td>
</tr>
<tr>
<td>Speakers</td>
<td>INTERNAL</td>
</tr>
<tr>
<td>Power Supply</td>
<td>310 W</td>
</tr>
<tr>
<td>Power Efficiency</td>
<td>90%</td>
</tr>
<tr>
<td>Energy Star for the given Model</td>
<td>YES</td>
</tr>
<tr>
<td>ROHS Compliance</td>
<td>YES</td>
</tr>
<tr>
<td>Warranty</td>
<td>5 YEARS ONSITE</td>
</tr>
<tr>
<td>UPS</td>
<td>BACK-UPS (LI) 700VA 230V</td>
</tr>
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</table>

**Item Code: 160**

**DESKTOP COMPUTER i5**

<table>
<thead>
<tr>
<th>Feature</th>
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</tr>
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<tbody>
<tr>
<td>Processor Make</td>
<td>INTEL</td>
</tr>
<tr>
<td>Processor Generation</td>
<td>8TH</td>
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<tr>
<td><strong>Processor</strong></td>
<td>Corei5 8500</td>
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<tr>
<td>Chipset</td>
<td>Intel H370</td>
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<tr>
<td>Graphics Type</td>
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<tr>
<td>Graphics</td>
<td>Intel HD</td>
</tr>
<tr>
<td>Operating System (Pre-Loaded)</td>
<td>Windows 10</td>
</tr>
<tr>
<td>Hard Disk</td>
<td>1000 GB HDD 7200 RPM</td>
</tr>
<tr>
<td>Type of RAM</td>
<td>DDR 4</td>
</tr>
<tr>
<td>RAM Speed</td>
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<td>4 GB</td>
</tr>
<tr>
<td>Feature</td>
<td>Specification</td>
</tr>
<tr>
<td>------------------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>RAM Expandability</td>
<td>32</td>
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<tr>
<td>DIMM Slots</td>
<td>2</td>
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<tr>
<td>Internal Bays</td>
<td>2</td>
</tr>
<tr>
<td>External Bays</td>
<td>1</td>
</tr>
<tr>
<td>Optical Drive</td>
<td>DVD R/W</td>
</tr>
<tr>
<td>Cabinet</td>
<td>TOWER</td>
</tr>
<tr>
<td>Cabinet Volume</td>
<td>less than 16 L</td>
</tr>
<tr>
<td>Network Connectivty</td>
<td>10/100/1000 on board Integrated Gigabit Port &amp; Integrated Wi-Fi</td>
</tr>
<tr>
<td>Expansion Slots (PCI)</td>
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<tr>
<td>Expansion Slots (PCIe x 1)</td>
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</tr>
<tr>
<td>Expansion Slots (PCIe x 16)</td>
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</tr>
<tr>
<td>USB Port 2.0</td>
<td>4</td>
</tr>
<tr>
<td>USB Port 3.1 Gen 1</td>
<td>4</td>
</tr>
<tr>
<td>Serial Port</td>
<td>Yes</td>
</tr>
<tr>
<td>VGA</td>
<td>YES</td>
</tr>
<tr>
<td>HDMI</td>
<td>Yes</td>
</tr>
<tr>
<td>Monitor Size</td>
<td>19.5 IPS</td>
</tr>
<tr>
<td>Monitor Resolution</td>
<td>1440 X 900</td>
</tr>
<tr>
<td>Monitor Certification</td>
<td>TCO 7</td>
</tr>
<tr>
<td>Keyboard</td>
<td>STANDARD</td>
</tr>
<tr>
<td>Mouse</td>
<td>OPTICAL</td>
</tr>
<tr>
<td>Speakers</td>
<td>INTERNAL</td>
</tr>
<tr>
<td>Power Supply</td>
<td>310 W</td>
</tr>
<tr>
<td>Power Efficiency</td>
<td>90%</td>
</tr>
<tr>
<td>Energy Star for the given Model</td>
<td>Yes</td>
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<tr>
<td>ROHS Compliance</td>
<td>YES</td>
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<tr>
<td>Warranty</td>
<td>5 YEARS ONSITE</td>
</tr>
<tr>
<td>UPS</td>
<td>BACK-UPS (LI) 700VA 230V</td>
</tr>
</tbody>
</table>

**Item Code: 161**

**DESKTOP COMPUTER i7**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Intel® 8th Generation Core i7-8700 6 Core CPU with minimum base frequency of 3.2 GHz, 12MB Cache or better</td>
</tr>
<tr>
<td>Chipset</td>
<td>Intel Q370 chipset</td>
</tr>
<tr>
<td>Motherboard</td>
<td>OEM Motherboard with OEM logo imposed on the motherboard (No Sticker)</td>
</tr>
<tr>
<td>Memory</td>
<td>16 GB DDR4 RAM expandable to 64GB; Four DIMM slots; Non-ECC dual-channel upto 2666 MT/s DDR4 SDRAM</td>
</tr>
<tr>
<td>Hard Disk Drive</td>
<td>1TB HDD, 7200 RPM, SATA III 6 Gbs, 512 GB SATA SSD</td>
</tr>
<tr>
<td>Optical Drive</td>
<td>8X DVD Writer</td>
</tr>
<tr>
<td>Graphics</td>
<td>Integrated Graphics</td>
</tr>
<tr>
<td>Audio</td>
<td>High Definition Integrated Audio with Internal Speaker in chassis of ate last 2W</td>
</tr>
<tr>
<td><strong>Ethernet</strong></td>
<td>Integrated Intel Gigabit (10/100/1000 NIC) LAN &amp; inbuilt Wi-Fi</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Slots</strong></td>
<td>Minimum 4 Full Height PCI/PCIe Slots (2xPCIex1 &amp; 1 x PClex16, 1 PClex4), &amp; 3 M.2 PCIe x1)</td>
</tr>
<tr>
<td><strong>Bays</strong></td>
<td>Minimum 5 bays with at least (2) 3.5” Drive bays &amp; (1) ODD bay</td>
</tr>
<tr>
<td><strong>Ports</strong></td>
<td><strong>Minimum 10 USB Ports (6 USB 3.1 Gen 1 &amp; 4 USB 2.0) &amp; at least 1 USB Type C Ports</strong></td>
</tr>
<tr>
<td></td>
<td>(1) VGA video port; (2) DisplayPort/DVI-D Port</td>
</tr>
<tr>
<td></td>
<td>(1) RJ-45 network connector</td>
</tr>
<tr>
<td></td>
<td>(1) RS-232 serial port</td>
</tr>
<tr>
<td></td>
<td>(1) Universal Audio jack in front</td>
</tr>
<tr>
<td></td>
<td>(1) one headphone jack in front</td>
</tr>
<tr>
<td></td>
<td>(2) PS/2 keyboard and mouse ports</td>
</tr>
<tr>
<td><strong>Form Factor</strong></td>
<td>Tower</td>
</tr>
<tr>
<td><strong>Power Supply</strong></td>
<td>500 W Power Supply with 91% efficiency or better</td>
</tr>
<tr>
<td><strong>Keyboard/Mouse</strong></td>
<td>USB 104 keys keyboard (Same make as PC)</td>
</tr>
<tr>
<td></td>
<td>USB 2 Button Scroll Mouse (Same make as PC)</td>
</tr>
<tr>
<td><strong>Operating System</strong></td>
<td>Genuine Microsoft Windows 10 Pro 64-bit</td>
</tr>
<tr>
<td><strong>Diagnostic Tool</strong></td>
<td>Inbuilt Pre-Boot BIOS Diagnostics</td>
</tr>
<tr>
<td><strong>Security</strong></td>
<td>TPM 2.0 Security Chip</td>
</tr>
<tr>
<td></td>
<td>Support for RAID</td>
</tr>
<tr>
<td></td>
<td>SATA port disablement (via BIOS)</td>
</tr>
<tr>
<td></td>
<td>Serial, parallel, USB enable/disable (via BIOS)</td>
</tr>
<tr>
<td></td>
<td>Removable media write/boot control</td>
</tr>
<tr>
<td></td>
<td>Power-On password (via BIOS)</td>
</tr>
<tr>
<td></td>
<td>Administrator password (via BIOS)</td>
</tr>
<tr>
<td></td>
<td>Setup password (via BIOS)</td>
</tr>
<tr>
<td></td>
<td>Support for chassis padlocks and cable lock devices</td>
</tr>
<tr>
<td><strong>Compliance and Certification</strong></td>
<td>Energy Star for quoted desktop &amp; Monitor</td>
</tr>
<tr>
<td></td>
<td>EPEAT Certified for India for the CPU &amp; Monitor</td>
</tr>
<tr>
<td></td>
<td>FCC,CE,RoHS, UL Certificate</td>
</tr>
<tr>
<td></td>
<td>TCO Certificate for quoted desktop &amp; monitor</td>
</tr>
<tr>
<td></td>
<td>ISO 9001, 14001, 20001, 27001 for OEM</td>
</tr>
<tr>
<td><strong>System Weight / Volume</strong></td>
<td>Weight should be no more than 10 KG and volume no more than 21L</td>
</tr>
<tr>
<td><strong>Information Accessibility</strong></td>
<td>Product details, specifications and brochure to be available in public domain</td>
</tr>
</tbody>
</table>
**Support**

Drivers should be available for download from OEM site for at least 3 years from the date of purchase order.

**Market Credibility**

The OEM vendor should be of positive net worth for the last three years.

**Monitor**

23.8 " or higher IPS Monitor with FHD Resolution of 1920 x 1080, TCO 7.0 Certification or higher.

**Warranty**

5 Years onsite

**UPS**

BACK-UPS (LI) 700VA 230V

---

**Item Code: 162**

**WORKSTATION**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Features</th>
<th>Qualifying Minimum Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Processor</td>
<td>2 X Intel Xeon 4216 2.1Ghz 16 Core</td>
</tr>
<tr>
<td>2</td>
<td>Chipset</td>
<td>Intel C622</td>
</tr>
<tr>
<td>3</td>
<td>BIOS</td>
<td>BIOS of the Workstation to have tool for Enhanced security features like self-healing, regular checks.</td>
</tr>
<tr>
<td>4</td>
<td>RAM</td>
<td>64GB DDR4 2933Mhz, 24 DIMM Slots - all slots should be on motherboard itself. Option for upgradeability up to 3 TB required.</td>
</tr>
<tr>
<td>5</td>
<td>Drive Controllers</td>
<td>Onboard 10-Channel 6Gbps SATA (RAID 0,1,5,10)</td>
</tr>
<tr>
<td>6</td>
<td>Hard Disk</td>
<td>2TB M.2 PCIe Based SSD &amp; 4 X 4TB 7200 SATA Enterprise 3.5&quot; HDD</td>
</tr>
<tr>
<td>7</td>
<td>Optical Drive</td>
<td>9.5mm Slim SuperMulti DVD Writer</td>
</tr>
<tr>
<td>8</td>
<td>Graphics Card</td>
<td>NVIDIA Quadro 16GB Graphics card and system should support to addition two more GV100 32GB in future</td>
</tr>
</tbody>
</table>
| 9      | Bays                      | 2 x External 5.25"
4 x Internal 3.5"
Option to add up to 4 nos of M.2 SATA SSD
System should be able to support a total of 16 drives along with a DVD drive. |
| 10     | Slots                     | Minimum requirement: 4 x PCIe x16 Gen3 (with Dual socket Config)
1 x PCIe x8 Gen3
2 x PCIe x4 Gen3 |
| 11     | Ports                     | Front: 4 x USB 3.1
Rear: 6 x USB 3.1,
2 x RJ45 LAN ports (Optional: 2 RJ-45 to 10GbE LAN ports) |
| 12     | Keyboard and Mouse        | Minimum 104 keys USB Keyboard and USB Optical Scroll mouse - Same make as that of the workstation |
| 13     | Audio                     | High Definition Integrated Audio with Internal speaker. |
| 14     | Power Supply              | Minimum 1700W under 200V input voltage with 90% Efficient wide. |
| 15     | Chassis                   | Completely tool less chassis with handles in front and rear side. Provision for Kensington lock and Panel lock required. Chassis Intrusion Sensor to be included, System should be rack-mountable. |
| 16     | Operating System          | Windows 10 Pro 64BIT and system should certify for Red Hat® Enterprise Linux® Desktop 7.4, SUSE Linux® Enterprise Desktop 12 SP3, Ubuntu 16.04 |
Remote Collaboration Solution

Hardware or Software based Remote Collaboration system which can help remotely access 3D data across network has to be supplied with the system.

- It should allow collaboration between multiple participants on an OpenGL 3D or DirectX applications.
- It should support One to One for remote work and One to many for collaboration with keyboard and mouse control.
- Application should be stateless and should not transfer actual data over the network.
- Pixel information or images should be 128 SSL encrypted.
- Should work on both Linux and Windows, and should be inter-operable.

Additional Software

1. The hardware vendor should supply an automatic system performance tuning and monitoring software on Windows.

2. The tuning software should have modules for resource monitoring over a long period of time, and should be capable of showing GPU utilisation (GPU, Graphics memory and Codec activity) for both Graphics and GPU Compute cards.

3. A complete Offline Diagnostics and Asset Discovery software suite should be supplied along with the system.

Warranty

3 years onsite parts and labour warranty for system and monitor

Vendor Status

The hardware vendor should be a reputed concern, having global presence in multiple countries. Vendor should have ISO certifications.

Cooling Solution

Air cooled forced convection

Item Code: 163

LAPTOP i3

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Technical Details</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MAKE/MODEL</td>
<td>Should be specified.</td>
</tr>
<tr>
<td>2</td>
<td>PROCESSOR</td>
<td>Intel® 8th Generation Core™ i3-8130U processor</td>
</tr>
<tr>
<td>3</td>
<td>CHIPSET</td>
<td>System on Chip</td>
</tr>
<tr>
<td>4</td>
<td>FLASH MEMORY (SD SLOT)</td>
<td>Card Reader slot for SD/MICRO SD card.</td>
</tr>
<tr>
<td>5</td>
<td>RAM</td>
<td>Minimum 8 GB DDR4 with 2 Physical DIMM slots</td>
</tr>
<tr>
<td>6</td>
<td>DISPLAY</td>
<td>14.0” HD display with 1376x768 pixel resolution or more, Mercury Free</td>
</tr>
<tr>
<td>7</td>
<td>HINGES</td>
<td>Metal &quot;reinforced hinges with Top cover Metal/Alloy body</td>
</tr>
<tr>
<td>8</td>
<td>GRAPHICS</td>
<td>Integrated Graphics Card.</td>
</tr>
<tr>
<td>9</td>
<td>AUDIO</td>
<td>Two built-in stereo speakers with high definition audio support. Built-in Dual microphone.</td>
</tr>
<tr>
<td>10</td>
<td>BLUETOOTH</td>
<td>Enabled 4.0 or higher</td>
</tr>
</tbody>
</table>
### Technical Details of LAPTOP i5

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Technical Details</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MAKE/MODEL</td>
<td>Should be specified.</td>
</tr>
<tr>
<td>2</td>
<td>PROCESSOR</td>
<td>Intel® 8th Generation Core™ i5-8250U processor</td>
</tr>
<tr>
<td>3</td>
<td>CHIPSET</td>
<td>System on Chip</td>
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<tr>
<td>4</td>
<td>FLASH MEMORY (SD SLOT)</td>
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<td>10</td>
<td>BLUETOOTH</td>
<td>Enabled 4.0 or higher</td>
</tr>
</tbody>
</table>

**Item Code: 164**

**LAPTOP i5**

- **WEBCAM**: Integrated HD Webcam
- **SSD**: 512 GB SSD or higher
- **ETHERNET CONTROLLERS**: Gigabit Ethernet
- **WIRELESS DEVICE**: Intel Wireless 802.11 ac Dual band
- **INTERFACES**: RJ-45, 3 USB 3.0, 1 Type C USB 3.1, Audio combo port, AC Adapter Jack, HDMI port, VGA port, 1 Kensington lock slot
- **KEYBOARD & TOUCH PAD DEVICE**: Backlit Standard Keyboard with touch pad with Multi gesture support
- **SECURITY**: BIOS password, Finger print reader, Hardware TPM 2.0
- **ACCESSORIES (COST INCLUDED)**: 3 pin Indian Adapter
- **BATTERY BACKUP**: 3 cell battery with 61 Whr or more capacity (Battery backup up to 10 hours)
- **CARRY CASE**: OEM carry Bag or Back pack
- **WEIGHT & THICKNESS**: Not exceeding 1.62 KGS including battery
- **OPERATING SYSTEM (OS)**: Preloaded Microsoft Windows 10 professional 64 bit with recovery media or image in the machine
- **WARRANTY**: 5 years on-site warranty
- **CERTIFICATION**: CE, FCC, CB, EPEAT Registered, Energy Star 7.0 or higher, UL, Windows 10
<table>
<thead>
<tr>
<th>S.No.</th>
<th>Technical Details</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MAKE/MODEL</td>
<td>Should be specified.</td>
</tr>
<tr>
<td>2</td>
<td>PROCESSOR</td>
<td>Intel® 8th Generation Core i7-8550U processor</td>
</tr>
<tr>
<td>3</td>
<td>CHIPSET</td>
<td>System on Chip</td>
</tr>
<tr>
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<td>FLASH MEMORY (SD SLOT)</td>
<td>Card Reader slot for SD/MICRO SD card.</td>
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<td>10</td>
<td>BLUETOOTH</td>
<td>Enabled 4.0 or higher</td>
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</tbody>
</table>

**Item Code: 165**

**LAPTOP i7**
<table>
<thead>
<tr>
<th></th>
<th>WEBCAM</th>
<th>Integrated HD Webcam</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>SSD</td>
<td>512 GB SSD or higher</td>
</tr>
<tr>
<td>3</td>
<td>ETHERNET CONTROLLERS</td>
<td>Gigabit Ethernet</td>
</tr>
<tr>
<td>4</td>
<td>WIRELESS DEVICE</td>
<td>Intel Wireless 802.11 ac Dual band</td>
</tr>
<tr>
<td>5</td>
<td>INTERFACES</td>
<td>RJ-45, 3 USB 3.0, 1Type C USB 3.1, Audio combo port, AC Adapter Jack, HDMI port, VGA port, 1 Kensington lock slot</td>
</tr>
<tr>
<td>6</td>
<td>KEYBOARD &amp; TOUCH PAD DEVICE</td>
<td>Backlit Standard Keyboard with touch pad with Multi gesture support</td>
</tr>
<tr>
<td>7</td>
<td>SECURITY</td>
<td>BIOS password, Finger print reader, Hardware TPM 2.0</td>
</tr>
<tr>
<td>8</td>
<td>ACCESSORIES (COST INCLUDED)</td>
<td>3 pin Indian Adapter</td>
</tr>
<tr>
<td>9</td>
<td>BATTERY BACKUP</td>
<td>3 cell battery with 61 Whr or more capacity (Battery backup up to 10 hours)</td>
</tr>
<tr>
<td>10</td>
<td>CARRY CASE</td>
<td>OEM carry Bag or Back pack</td>
</tr>
<tr>
<td>11</td>
<td>WEIGHT &amp; THICKNESS</td>
<td>Not exceeding 1.62 KGS including battery</td>
</tr>
<tr>
<td>12</td>
<td>OPERATING SYSTEM (OS)</td>
<td>Preloaded Microsoft Windows 10 professional 64 bit with recovery media or image in the machine</td>
</tr>
<tr>
<td>13</td>
<td>WARRANTY</td>
<td>5 years on-site warranty</td>
</tr>
<tr>
<td>14</td>
<td>Certification</td>
<td>CE, FCC, CB, EPEAT Registered, Energy Star 7.0 or higher, UL, Windows 10</td>
</tr>
</tbody>
</table>

**Item Code: 166**

**PRINTER DUPLEX LESERJET**

<table>
<thead>
<tr>
<th>Technology</th>
<th>Laser Duplex Printer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print speed black (normal, letter)</td>
<td>Up to 26 ppm</td>
</tr>
<tr>
<td>Print speed black (normal, A4)</td>
<td>Up to 25 ppm</td>
</tr>
<tr>
<td>Print speed</td>
<td>Print speed up to 26 ppm (black)</td>
</tr>
<tr>
<td>Print speed duplex (A4)</td>
<td>Up to 15 ipm</td>
</tr>
<tr>
<td>Print speed duplex (letter)</td>
<td>Up to 16 ipm</td>
</tr>
<tr>
<td>First page out black (letter, ready)</td>
<td>As fast as 8 sec</td>
</tr>
<tr>
<td>First page out black (A4, ready)</td>
<td>As fast as 8 sec</td>
</tr>
<tr>
<td>First page out black (letter, sleep)</td>
<td>As fast as 8 sec</td>
</tr>
<tr>
<td>Duty cycle (monthly, letter)</td>
<td>Up to 30,000 pages</td>
</tr>
<tr>
<td>Memory</td>
<td>128 MB</td>
</tr>
<tr>
<td>Output capacity</td>
<td>Up to 150 sheets</td>
</tr>
<tr>
<td>Maximum output capacity (sheets)</td>
<td>Up to 150 sheets</td>
</tr>
<tr>
<td>Standard output capacity (transparencies)</td>
<td>Up to 100 sheets</td>
</tr>
<tr>
<td>Print speed, black</td>
<td>21 – 30</td>
</tr>
<tr>
<td>Colour output</td>
<td>Black and white</td>
</tr>
</tbody>
</table>
### Item Code: 167
**PRINTER MFP**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour output</td>
<td>Black and white</td>
</tr>
<tr>
<td><strong>CATEGORY</strong></td>
<td></td>
</tr>
<tr>
<td>Product type</td>
<td>Laser Printers</td>
</tr>
<tr>
<td>Family brand</td>
<td>LaserJet</td>
</tr>
<tr>
<td>Functions</td>
<td>Print scan and copy</td>
</tr>
<tr>
<td>Ports</td>
<td>1 Hi-Speed USB</td>
</tr>
<tr>
<td>Copy speed (black, normal quality, A4)</td>
<td>Up to 14 cpm</td>
</tr>
<tr>
<td>Copy speed black (draft, A4)</td>
<td>Up to 14 cpm</td>
</tr>
<tr>
<td>Paper trays, maximum</td>
<td></td>
</tr>
<tr>
<td>Duty cycle (monthly, A4)</td>
<td>Up to 5000 pages</td>
</tr>
<tr>
<td>Paper trays, standard</td>
<td></td>
</tr>
<tr>
<td>Recommended monthly page volume</td>
<td>250 to 2000</td>
</tr>
<tr>
<td>Print technology</td>
<td>Monochrome Laser</td>
</tr>
<tr>
<td>Output capacity</td>
<td></td>
</tr>
<tr>
<td>Maximum output capacity (sheets)</td>
<td>Up to 100</td>
</tr>
<tr>
<td>Standard output capacity (transparencies)</td>
<td>Up to 65</td>
</tr>
<tr>
<td>Media type and capacity, tray 1</td>
<td>sheets: 10, transparencies: 1, envelopes: 1</td>
</tr>
<tr>
<td>Media type and capacity, tray 2</td>
<td>sheets: 150, transparencies: 100, envelopes: 10</td>
</tr>
<tr>
<td>Paper handling input, standard</td>
<td>150-sheet input tray, 10-sheet priority tray</td>
</tr>
<tr>
<td>Input capacity</td>
<td>Up to 150</td>
</tr>
<tr>
<td>Paper handling</td>
<td>150-sheet input tray, 10-sheet priority tray</td>
</tr>
</tbody>
</table>

### Item Code: 168
**PRINTER MFP DUPLEX NETWORK**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>A4</td>
</tr>
<tr>
<td>Speed</td>
<td>39/20</td>
</tr>
<tr>
<td>Print resolution DPI</td>
<td>1200x2400</td>
</tr>
<tr>
<td>Print</td>
<td>Duplex</td>
</tr>
<tr>
<td>Scan</td>
<td><strong>Optical Resolution:</strong> 1200 x 2400 dpi</td>
</tr>
<tr>
<td>Copy</td>
<td>yes, 600x600 dpi</td>
</tr>
<tr>
<td><strong>FAX</strong></td>
<td></td>
</tr>
<tr>
<td>Type Of Fax</td>
<td>Walk-up black-and-white and colour fax capability</td>
</tr>
<tr>
<td>Receive Memory / Page Memory</td>
<td>2 MB, Page memory, Up to 180 pages (ITU-T No.1 chart)</td>
</tr>
<tr>
<td>Error Correction Mode</td>
<td>ITU-T T.30Fax</td>
</tr>
<tr>
<td>Speed (Data Transfer Rate)</td>
<td>Up to 33.6 kbps, Approx. 3 sec/page</td>
</tr>
<tr>
<td>Fax Resolution</td>
<td>Up to 200 x 200 dpi, Transmission Paper Size (Flatbed): Letter, A4</td>
</tr>
<tr>
<td>ADF</td>
<td>ADF Capacity: 64 to 95 g/m², Paper Capacity: 35 sheets of A4 paper</td>
</tr>
<tr>
<td>Network</td>
<td>TCP/IPv4, TCP/IPv6</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Wi-Fi</td>
<td>Yes</td>
</tr>
<tr>
<td>Wi-Fi Direct</td>
<td>Yes</td>
</tr>
<tr>
<td>Duplex</td>
<td>Automatic</td>
</tr>
<tr>
<td>iPrint</td>
<td>Yes</td>
</tr>
<tr>
<td>Google cloud print</td>
<td>Yes</td>
</tr>
<tr>
<td>Apple Air Print</td>
<td>Yes</td>
</tr>
<tr>
<td>Display</td>
<td>Yes</td>
</tr>
<tr>
<td>Warranty</td>
<td>3 years or 50,000 pages</td>
</tr>
<tr>
<td>Service</td>
<td>Onsite</td>
</tr>
<tr>
<td>Ink system</td>
<td>Pigment</td>
</tr>
</tbody>
</table>

**Print Speeds**

- Draft Text - Memo, A4 (Black): Up to 39 ppm *1
- ISO 24734, A4 (Black): Simplex: Up to 20 ipm, Duplex: 9.0 ipm

**Number of Paper Trays**

- 2

**Paper Hold Capacity:**

- Input Capacity: Cassette 1: 250 Sheets-A4 / Letter Plain Paper (80 g/m2); 10-sheets-Envelope; Rear Slot: 1 Sheet-A4 Plain Paper
- Output Capacity: Up to 100 sheets

**Print Margin:**

- 3 mm top, left, right, bottom via custom settings in printer driver

**Operating:**

- Operating: 12 W
- Standby: 5.6 W
- Sleep: 0.9 W
- Power Off: 0.2 W

**Standard Capacity**

- Black: Page Yield: 2,000 *3
- High Capacity Black: Page Yield: 6,000 *3

**Item Code: 169**

**PRINTER COLOUR MFP**

<table>
<thead>
<tr>
<th>Printer Type:</th>
<th>Print, Scan, Copy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print Method:</td>
<td>Precision Core Printhead</td>
</tr>
<tr>
<td>Minimum Ink Droplet Volume:</td>
<td>3.3 pl</td>
</tr>
<tr>
<td>Printer Language:</td>
<td>ESC / P-R</td>
</tr>
<tr>
<td>Control Panel:</td>
<td>2.4 &quot; Colour LCD</td>
</tr>
<tr>
<td>Print Direction:</td>
<td>Bi-directional printing, Uni-directional printing</td>
</tr>
<tr>
<td>Nozzle Configuration:</td>
<td>400 nozzles Black, 128 nozzles per colour (Cyan, Magenta, Yellow)</td>
</tr>
<tr>
<td>Maximum Resolution:</td>
<td>4800 x 1200 dpi (with Variable-Sized Droplet Technology)</td>
</tr>
<tr>
<td>Automatic 2-sided printing:</td>
<td>Yes (up to A4)</td>
</tr>
<tr>
<td>Print Speed:</td>
<td></td>
</tr>
</tbody>
</table>
- Photo Default - 10 x 15 cm / 4 x 6 " *2: Approx. 69 sec per photo (Border) *1
- Approx. 92 sec per photo (Borderless) *1
- Draft, A4 (Black / Colour): Up to 33 ppm / 20 ppm *1
- ISO 24734, A4 Simplex (Black / Colour): Up to 15 ipm / 8.0 ipm *1
- ISO 24734, A4 Duplex (Black / Colour): Up to 6.5 ipm / 4.5 ipm *1 |
### Item Code: 170
**SMART CARD PRINTER**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Card Thickness: 10-50 mil</td>
</tr>
<tr>
<td>2</td>
<td>Full Color: 150 Cards/ Hr / side</td>
</tr>
<tr>
<td>3</td>
<td>Monochrome Black: 600 Cards / Hr / side</td>
</tr>
<tr>
<td>4</td>
<td>Front Side Input Hopper- 100 Cards</td>
</tr>
<tr>
<td>5</td>
<td>Front Side Output Hopper- &gt; 50 Cards</td>
</tr>
<tr>
<td>6</td>
<td>Reject Tray- 25+ cards</td>
</tr>
<tr>
<td>7</td>
<td>YMCKO Full Panel - 250+ Images</td>
</tr>
<tr>
<td>8</td>
<td>Monochrome Black Ribbon - up to 2000 Images</td>
</tr>
<tr>
<td>9</td>
<td>Printer Manager with Graphical Notification</td>
</tr>
<tr>
<td>10</td>
<td>Software Locking through driver</td>
</tr>
<tr>
<td>11</td>
<td>Driver Available on windows, vista, Mac. Linux</td>
</tr>
<tr>
<td>12</td>
<td>Compatible with 300 to 600 dpi</td>
</tr>
<tr>
<td>13</td>
<td>Compatible with 600 to 1200 dpi for monochrome</td>
</tr>
<tr>
<td>14</td>
<td>Auto Ribbons Sensing</td>
</tr>
<tr>
<td>15</td>
<td>Compatible with Lamination Module</td>
</tr>
<tr>
<td>16</td>
<td>Compatible with LCD Display</td>
</tr>
</tbody>
</table>

### Item Code: 171
**FLATBED SCANNER A4**

Scanner Type: Flatbed color image scanner with ADF  
Photoelectric Device: 1200 dpi color 4-line  
CCD sensor (RGB and black)  
Optical Resolution:  
Flatbed: 1200 dpi  
ADF: 600 dpi  
Hardware Resolution:  
Flatbed: 1200 x 1200 dpi with Micro Step Drive™ technology  
ADF: 600 x 600 dpi Micro Step Drive™ technology  
Maximum Resolution: 1200 flatbed and 600 dpi ADF  
Color Bit Depth: 48-bits per pixel internal / 24-bit external  
Grayscale Bit Depth: 16-bits per pixel internal / 8-bit external  
Optical Sensor: 1200 dpi 4-line color line sensor (RGB & Black)  
Maximum Scan Area:  
Flatbed: 8.5" x 11.7"  
ADF: 8.5" x 40"  
Light Source: Ready Scan LED  
Scanning Speed:  
200 dpi  
B/W: Up to 40 ppm / 80 ipm with ADF  
Color: Up to 40 ppm / 80 ipm with ADF  
300 dpi  
B/W: Up to 40 ppm / 80 ipm with ADF  
Color: Up to 40 ppm / 80 ipm with ADF  
600 dpi  
B/W: Up to 8 ppm / 16 ipm with ADF  
Color: Up to 8 ppm / 16 ipm with ADF  
Automatic Document Feeder:  
Capacity: 100 pages (80 g/m²)  
Type: Sheet fed 1-pass, duplex scanning  
Document Sizes:  
A4, Letter, Legal, B5, A5  
Max. Size 8.5" x 40"  
Min. Size 4" x 6"  
Paper Weight: Thickness 50 – 128 g/m²
General:
Operating Systems: Windows® 8, Windows 7, Windows Vista®, Windows, Windows XP Professional x64 Edition, Mac OS® X 10.5.x, 10.6.x, 10.7.x, 10.8.x,
Storage 10% to 85% (no condensation)

**Item Code: 172**
**FLATBED SCANNER A3**

<table>
<thead>
<tr>
<th><strong>SCANNER TYPE</strong></th>
<th>Flatbed A3 colour image scanner</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRODUCT NAME</strong></td>
<td>Expression 11000XL</td>
</tr>
<tr>
<td><strong>PRODUCT CODE</strong></td>
<td>B11B208405</td>
</tr>
<tr>
<td><strong>SUB-SCANNING METHOD</strong></td>
<td>Movement of the carriage</td>
</tr>
<tr>
<td><strong>Photo ELECTRIC DEVICE</strong></td>
<td>6-line alternated colour CCD (94,500 pixels)</td>
</tr>
</tbody>
</table>

**DOCUMENT SIZE**

<table>
<thead>
<tr>
<th><strong>SCANNING PLATEN</strong></th>
<th>310 x 437mm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TRANSPARENCY UNIT</strong></td>
<td>309 x 420mm</td>
</tr>
<tr>
<td><strong>LIGHT SOURCE</strong></td>
<td>Xenon gas fluorescent lamp</td>
</tr>
</tbody>
</table>

**OPTICAL RESOLUTION**

- **Main:** 2,400dpi (optical resolution by 6-line CCD with 87,840 pixels)
- **Sub:** 4,800dpi with Micro Step

**OPTICAL DENSITY**

3.8 D Max

**OUTPUT RESOLUTION**

- 50dpi to 12,800dpi (in 1 dpi steps)

**ZOOM**

50% to 200% (in 1% steps)

**PIXEL DEPTH**

- 48 bits internal
- 24 bit external

**SCANNING SPEED**

1,200dpi REFLECTIVE DOCUMENT

<table>
<thead>
<tr>
<th>Document Type</th>
<th>Speed (msec/line)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Art</td>
<td>2.7</td>
</tr>
<tr>
<td>Greyscale</td>
<td>2.7</td>
</tr>
<tr>
<td>Colour</td>
<td>8.0</td>
</tr>
</tbody>
</table>

2,400dpi REFLECTIVE DOCUMENT

<table>
<thead>
<tr>
<th>Document Type</th>
<th>Speed (msec/line)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Art</td>
<td>5.3</td>
</tr>
<tr>
<td>Greyscale</td>
<td>5.3</td>
</tr>
<tr>
<td>Colour</td>
<td>16.0</td>
</tr>
</tbody>
</table>

TRANSPARENCY DOCUMENT

<table>
<thead>
<tr>
<th>Document Type</th>
<th>Speed (msec/line)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Film</td>
<td>16.0</td>
</tr>
<tr>
<td>Negative Film</td>
<td>16.0</td>
</tr>
</tbody>
</table>

**Item No. 174**
**BOOK SCANNER TYPE 1**

High level 600 dpi production system. Unique self-adjusting and V-shaped book cradle with motor driven glass plate
<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Scan Area</td>
<td>460 x 620 mm (18 x 24.4 inch), 14% more than DIN/ISO A2</td>
</tr>
<tr>
<td>Scanner Resolution</td>
<td>600 x 600 dpi</td>
</tr>
<tr>
<td>Scan Speed</td>
<td>DIN A2+ @ 150 dpi: 0.9 s, DIN A2+ @ 200 dpi: 1.1 s</td>
</tr>
<tr>
<td></td>
<td>DIN A2+ @ 300 dpi: 1.6 s, DIN A2+ @ 400 dpi: 2.0 s</td>
</tr>
<tr>
<td>DIN A2+ @ 600 dpi</td>
<td>3.0 s</td>
</tr>
<tr>
<td>Colour Depth</td>
<td>48 bitcolor, 16-bit grayscale</td>
</tr>
<tr>
<td>Scan Output</td>
<td>24 bitcolor, 8-bit grayscale, bitonal, enhanced halftone</td>
</tr>
<tr>
<td>File Formats</td>
<td>Multipage PDF (PDF/A) and TIFF, JPEG, JPEG 2000, PNM, PNG, BMP, TIFF (Raw, G3, G4, LZW, JPEG), AutoCAD DWF, JBIG, DjVu, DICOM, PCX, Postscript, EPS, Raw data</td>
</tr>
<tr>
<td>ICC Profiles</td>
<td>Embedded for sRGB, Adobe RGB and native. Individual profiling via web based Scan2ICC subscription</td>
</tr>
<tr>
<td>Quality</td>
<td>Exceeds FADGI ** guidelines, ISO 19264-1</td>
</tr>
<tr>
<td>Camera</td>
<td>CCD camera</td>
</tr>
<tr>
<td>Light Source</td>
<td>White LEDs, tested according to IEC 62471, no IR/UV emission</td>
</tr>
<tr>
<td>Lamp Life Time</td>
<td>50.000 h (typ.)</td>
</tr>
<tr>
<td>Computer</td>
<td>64-bit Linux, Intel i3, quad core processor, 8 Gigabyte RAM, 320GB HDD for extra-large jobs</td>
</tr>
<tr>
<td>Touchscreen / Monitor</td>
<td>7-inch colour WVGA (wide VGA) touchscreen / 22-inch touchscreen (optionally available)</td>
</tr>
<tr>
<td>USB Port</td>
<td>2 USB Ports 3.0</td>
</tr>
<tr>
<td>Interface</td>
<td>1 GBit Fast Ethernet with TCP/IP based Scan2Net ® Interface</td>
</tr>
<tr>
<td>Dimension</td>
<td>900 x 880 x 860 mm (35.4 x 34.6 x 33.9 inch) (H x W x D)</td>
</tr>
<tr>
<td>Weight</td>
<td>109 kg / 240 lbs.</td>
</tr>
<tr>
<td>Electrical Specification</td>
<td>100-240 V AC, 47 - 63 Hz (external power supply, complies with ECO standard CEC level VI)</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>16.5 W (Standby) / &lt; 75 W (Ready to scan) / 150 W (Scanning) / 150 W (Fully automatic scan cycle)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>5 to 40 °C, 40 to 105 °F</td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>20 to 80 % (non-condensing)</td>
</tr>
<tr>
<td>Noise</td>
<td>&lt; 56 dB(A) (Fully automatic scan cycle) / &lt; 40 dB(A) (Scanning) / &lt; 33 dB(A) (Standby)</td>
</tr>
</tbody>
</table>

**Item No. 175**

**BOOK SCANNER TYPE II**

**Table lamp type Tabletop scanner**

Purpose Organization/corporation/Library/Archives/Museum/Service centre

Product type Professional book scanner

Scanning materials Documents, Books, Magazines, Forms, Invoices, Certificates, Business cards and Sculpture objects

Sensor CMOS

Pixel 20 million

Resolution 5248*3936

DPI (Default) 300

Format ≤A3, 297mm×420mm

Speed Flat single page≈1.2s/page; Books≈1.2s/dual pages

Page 137 of 155
Pre scan 0 second
Image format JPG, PDF, TIFF
Colour bit depth 24 bits
Image output format JPG, PDF, Searchable PDF, Word, Excel, TIFF
Video streaming format MJPG
Preview PC-Visual presenter: 3072*1728@12Fps; PC-Scanning:1536*1152@20Fps
USB USB 2.0 High-Speed
Light source Natural light and LED lights
Top LED lights
Side lights
Focus mode Fixed focus
Scanning access Device Control, Software triggering, Hand button, Foot pedal
System support Win XP, Win 7/8/10, 32/64-bit; macOS 10.11 and above
Processor 32-bit MIPS CPU
Laser - assisted 3 laser rays
DDR 1G bit
Image cache Hi-Speed DDR
LCD 2.4", 4:3, 320x240
MIC
Buzzer
Hand button
Foot pedal
Book cradle
Book cover block
Power adapter Input:100 to 240V, 50/60Hz; Output: 9V/2A
OCR
OCR Languages 187
Visual presenter USB-PC Visual presenter
Flattening curve
Smart paging
Smart tilt corrections and auto-cropping
Professional trimming
Background purifying
Finger removal
Colour mode Colour、Patterns、Stamps、Grayscale、B&W
Auto-scan
Manual Selection scanning
Combined Sides scanning
Blank page detection
Watermark
Screen recording
Video recording
Element 2G2P+IR
Sensor Size 1/2.3"
EFL 4.7mm
BFL 6.18mm
F/NO 3.5
IR Cut 650±10nm
Field of view 82°
Distortion <0.3%
Product appearance Black
Product dimensions 505*520*425 mm (L*W*H)
Weight 4.5KG (Net)
Packing information Scanner, Side lights, USB cable, Power adapter, Hand button, Foot pedal, Black document pad, Specialized finger cots, CD, User manual, Warranty card, Quality certificate

**Item Code: 176**  
**PHOTOCOPIER MACHINE (BIG)**

**GENERAL**
Warm-up time: 20 seconds
First output speed: 4.6/4.6/4.3/4.0/2.9/2.9 seconds
Continuous output speed: 25/30/35/40/50/60 pages per memory
Memory: minutes Standard: 2 GB
HDD: 320 GB
Dimensions (W x D x H): 587 x 684 x 788 mm (MF only)
Weight: 62.5 kg or less
Power source: 220-240 V, 50/60 Hz

**COPIER**
Copying process: Single laser beam & electro-photographic printing
Twin laser beams & Electro-photographic printing
Multiple copying: Up to 999 copies
Resolution: 600 x 600 dpi
Zoom: From 25% to 400% in 1% steps

**PRINTER**
Printer language: Standard: PCL5e, PCL6, PDF Direct, PS3 (Emulation)
Option: Adobe PostScript3, Adobe PDF
Print resolution: Maximum 1,200 x 1,200 dpi
Interface:
Standard: USB Host I/F, Ethernet 10 base-T/100 base-TX/1000 base-T
Option: Wireless LAN (IEEE 802.11a/b/g/n), Bluetooth, USB Server for Second Network Interface, Bidirectional
IEEE 1284/ECP, USB 2.0
Network protocol: TCP/IP (IP v4, IP v6)

**FAX (OPTION)**
Circuit: PSTN, PBX
Compatibility: ITU-T (CCITT) G3
Resolution:
8 x 3.85 line/mm, 200 x 100 dpi (standard)
8 x 7.7 line/mm, 200 x 200 dpi (standard)
8 x 15.4 line/mm, 16 x 15.4 line/mm, 400 x 400 dpi (with optional SAF memory)
Transmission speed: G3: 2 seconds (200 x 100 dpi, JBIG)
G3: 3 seconds (200 x 100 dpi, MMR)
Modem speed: Maximum: 33.6 Kbps
SCANNER
Scanning speed: ARDF: Max. 80 originals per minute
SPDF: Max. 110 (simplex) / 180 (duplex) originals per minute
Resolution: Standard: 100 dpi, 200 dpi, 300 dpi, 400 dpi, 600 dpi Default: 200 dpi
Original size: A3, A4, A5, B4, B5, B6
File format: TIFF, JPEG, PDF, High Compression PDF, PDF-A
Bundled drivers: Network TWAIN Driver

PAPER HANDLING
Recommended paper size: A3, A4, A5, A6, B4, B5, B6
Paper input capacity: Standard: 1,200 sheets
(2x550 sheets paper tray
1x100 sheets bypass tray)
Maximum: 4,700 sheets
(2x550 sheets paper tray
1x100 sheets bypass tray
2x1000 sheets LCT
1x1500 sheets side LCT)

Item Code: 177
PHOTOCOPIER MACHINE (SMALL)
Functions
Print, Scan, Copy, Fax
Operation panel 7-inch Smart Operation Panel
Warm-up time 27 seconds
First output speed 6.5 seconds
Continuous output speed 27ppm
Memory Standard: 2GB
ARDF capacity 100 sheets
Weight [Mainframe] 46.5kg or less
Dimensions W x D x H 587 x 581 x 677 mm
Power source 220 - 240V 50/60Hz

Copier
Multiple copying Up to 999 copies
Resolution 600 x 600 dpi
Zoom From 25% to 400% in 1% steps

PRINTER
Printer
CPU ARM CortexA53 800 MHz
Printer language Standard: PCL5e/6, PostScript3
Print resolution 600 x 600 dpi
Network interface Standard: Ethernet (1000/100/10BASE), Wireless LAN (IEEE802.11a/b/g/n), USB 2.0-Device (Type-B), USB 2.0-Host
Mobile printing capability Apple Air Print™, Mopria, Google Cloud Print
Mac OS environments Mac OS X (V10.11 or Later)
UNIX environments UNIX Sun® Solaris, HP-UX, SCO Open Server, RedHat® Linux, IBM® AIX
SAP® environments SAP® R/3®, SAP® S/4®
Scanner
Scanning speed Mono: 50ipm Colour: 50ipm
Resolution Maximum: 600 dpi
Compression method MH/MR/MMR, JPEG
File formats
Single Page TIFF, Multi Page TIFF, Single Page JPEG, Single Page PDF, Multi Page PDF,
Single Page High-Compression PDF,
Multi Page High-Compression PDF
Scan modes Email, Folder, Network Twain, USB

FAX
Circuit PSTN
Transmission speed 3 seconds
Modem speed 2,400 bps-33.6 Kbps with automatic shift down
Resolution Standard: 8 x 3.85 line/mm (200 x 100 dpi), 8 x 7.7 line/mm (200 x 200 dpi)
Compression method MH, MR, MMR
Memory Standard: 9.7MB

Paper loading
Recommended paper size A3, A4, A5, A6, B4, B5, B6
Paper input capacity
Standard: 500 sheets
Maximum: 1,600 sheets
Paper output capacity Standard: 250 sheets
Paper weight
Tray: 52 - 105g/m²
Bypass: 60 - 216g/m²
Paper types
Thin Paper, Plain Paper 1, Plain Paper 2, Recycled, Colour Paper, Special Paper, Middle Thick Paper, Printed Paper, Pre-printed Paper,
Input try option
1 x 500-sheet paper tray (PB2030) Paper size: A5-B4, Paper weight: 60-105g/m²
2 x 500-sheet paper tray (PB2040) Paper size: A5-B4, Paper weight: 60-105g/m²

Security
Features
Locked Print, SSL communication encryption, Transport Layer Security (TLS), SMTP over SSL/TLS, Wireless LAN encryption,
Network Protocol, IP filtering
SECTION VIII: QUALIFICATION CRITERIA

1. In case the manufacturer does not quote directly, they may authorise their authorized agent as per Proforma of “Manufacturer Authorization Form” as given in the Tender Document to quote and enter into a contractual obligation.

2. The Manufacturer should have supplied and installed in last five years from the date of Bid Opening, similar equipment meeting major parameters of technical specification which is functioning satisfactorily.

3. In support of 2, the Bidder shall furnish Performance statement in the enclosed Proforma ‘A’ of Section VIII. The Bidder shall furnish Satisfactory Performance Certificate in respect of above, duly translated in English and duly signed along with the bid.

4. The Purchaser reserves the right to ask for a free demonstration of the quoted equipment after giving reasonable time to the bidder at a pre-determined place acceptable to the purchaser or at site (in case of non-portable and heavy equipment) for technical acceptability as per the Tender Document specifications, before the opening of the Price Bid.
PROFORMA ‘A’
PROFORMA FOR PERFORMANCE STATEMENT
(For the period of last five years)

Advertised Tender Document No. : ________________________
Date of Technical Bid Opening : ________________________
Name and address of the Bidder : ________________________
Name and address of the Manufacturer : ________________________

<table>
<thead>
<tr>
<th>Order placed by (full address)</th>
<th>Order no. and date ##</th>
<th>Description (Model No.) and quantity</th>
<th>Value of order (’ )</th>
<th>Consignee</th>
<th>Date of Delivery Period</th>
<th>Contract Actual</th>
<th>Reasons for Delay if Any</th>
<th>Have the goods been functioning Satisfactorily (attach documentar y proof) **</th>
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We hereby certify that the details of all orders received in last 5 years of quoted equipment has been furnished. We hereby further certify that if at any time, information furnished by us is proved to be false or incorrect; we are liable for any action as deemed fit by the purchaser in addition to forfeiture of the Bid Security.

Name ______________________

Business Address ______________________

Signature of Bidder ______________________

Place: ______________________

Seal of the Bidder ______________________

** The scanned copy of documentary proof will be a latest certificate from the consignee/end user with cross-reference of order no. and date may be furnished

## The bidders are requested to furnish the scanned copy of purchase order copies for the specific model quoted along with the Techno-commercial Bid.
SECTION IX: TENDER ACCEPTANCE FORM

To
The Registrar,
Utkal University
Vani Vihar, Bhubaneswar
Odisha, India, PIN – 751 004

Ref. Your Advertised Tender Document No. _______________________________ due for opening on ________________

We, the undersigned have examined the above-mentioned Tender document, including amendment/corrigendum (if any), the receipt of which is hereby confirmed. We now offer to supply and deliver____________________ (Description of goods and services) in conformity with your above referred document for the sum as shown in the Price Schedules attached herewith and made part of this bid. If our bid is accepted, we undertake to supply the goods and perform the services as mentioned in the Tender documents, in accordance with the delivery schedule specified in the List of Requirements.

We further confirm that, if our bid is accepted, we shall provide you with a performance security of required amount in an acceptable form in terms of “General Conditions Contract”, Section IV read with modification, if any “Special Conditions of Contract”, in Section V, for due performance of the contract.

We agree to keep our bid valid for acceptance as required in the “General Instruction to Bidders”, read with modification, if any “Special Instructions to Bidders”, Section III or for subsequently extended period, if any, agreed to by us. We also accordingly confirm to abide by this bid up to the aforesaid period and this bid may be accepted any time before the expiry of the aforesaid period. We further confirm that, until a formal contract is executed, this bid read with your written acceptance thereof within the aforesaid period shall constitute a binding contract between us. We further understand that you are not bound to accept the lowest or any bid you may receive against your above-referred advertised tender enquiry. We confirm that we do not stand deregistered/banned/blacklisted by any Central Govt. Ministries/Departments/ Universities /Institutes.

We confirm that we fully agree to the terms and conditions specified in above mentioned Tender document, including amendment/ corrigendum if any. “We hereby certify that if at any time, information furnished by us is proved to be false or incorrect, we are liable for any action as deemed fit by the purchaser in addition to forfeiture of the bid security.”

Name: ____________________________________________________________

Business Address: ____________________________________________________

Place: ____________
Date: ____________
SECTION X: **PRICE SCHEDULE / FINANCIAL BID**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Item Code</th>
<th>Name of the Item</th>
<th>Quoted Unit Price (Turnkey basis) including all taxes in INR</th>
<th>CAMC in INR</th>
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**Note:** If this sheet is not sufficient to accommodate the bid details, an additional sheet(s) containing the same proforma (with seal and signature of the Bidder) may be used.

Signature with date and seal
SECTION XI: BANK GUARANTEE FORM FOR BID SECURITY

Whereas ________________________________(Name and address of the Bidder)
(hereinafter called the “Bidders”) has submitted its Bid dated ________________________________for the supply of ____________________________
(hereinafter called the “Bid”)
Against the purchaser's Advertised Tender Document No. ________________________________

Know all persons by these presents that we ________________________________
having our registered office at ________________________________

(Hereinafter called the “Bank”)
are bound unto AIIMS, New Delhi
(hereinafter called the “Purchaser”)
in the sum of ________________________________for which payment will and truly to be made to the said Purchaser, the Bank binds itself, its successors and assigns by these presents. Sealed with the Common Seal of the said Bank this _______ day of _______ 20

The conditions of this obligation are:
1. If the Bidder withdraws or amends, impairs or derogates from the bid in any respect within the period of validity of this Bid.
2. If the Bidder having been notified of the acceptance of his Bid by the Purchaser during the period of its validity:
   a. If the bidder fails or refuses to furnish the performance security for the due performance of the contractor
   b. If the bidder fails or refuses to accept/execute the contractor
   c. If it comes to notice at any time, that the information/documents furnished in its Bid are false or incorrect or misleading or forged

We undertake to pay the Purchaser up to the above amount upon receipt of its first written demand, without the Purchaser having to substantiate its demand, provided that in its demand the Purchaser will note that the amount claimed by it is due to it owing to the occurrence of one or more the three conditions, specifying the occurred condition(s).

This guarantee will remain in force up to ____________ (insert date of additional sixty days after Bid validity) and any demand in respect thereof should reach the Bank not later than the above date.

........................................
(Signature with date of the authorized officer of the Bank)
...............................................................
(Name and designation of the Officer)
...............................................................
(Seal, name & address of the Bank and address of the Branch)
To
The Registrar,
Utkal University
Vani Vihar, Bhubaneswar
Odisha, India, PIN – 751 004

Ref. Your Advertised Tender Document No. _____________________ dated ___________

Dear Sir,

We, ____________________________________________________ who are proven and reputable manufacturers of ____________________________ (name and description of the goods offered in the bid) having factories at ______, hereby authorise Messrs ______________ (name and address of the agent) to submit a bid, process the same further and enter into a contract with you against your requirement as contained in the above referred TE documents for the above goods manufactured buys.

We also state that we are not participating directly in this bid for the following reason(s):

____________________________________________________________________________________________ (Please provide reason here).

We further confirm that no supplier or firm or individual other than Messrs. ____________________________________________________ (name and address of the above agent) is authorized to submit a bid, process the same further and enter into a contract with you against your requirement as contained in the above referred Tender documents for the above goods manufactured buys.

We also hereby extend our full warranty, CAMC as applicable as per clause 15 of the General Conditions of Contract, read with modification, if any, in the Special Conditions of Contract for the goods and services offered for supply by the above firm against this TE document.

We also hereby confirm that we would be responsible for the satisfactory execution of contract placed on the authorized agent and the spares for the equipment shall be available for at least 10 years from the date of supply of equipment.

We also confirm that the price quoted by our agent shall not exceed the price which we would have quoted directly

Yours faithfully,

[Signature with date, name and designation]

for and on behalf of Messrs ________________________________

[Name & address of the manufacturers]

Note: 1. This letter of authorisation should be on the letter head of the manufacturing firm and should be signed by a person competent and having the power of attorney to legally bind the manufacturer.

2. Original letter may be sent.
SECTION XIII: BANK GUARANTEE FORM FOR PERFORMANCE SECURITY/ CAMC SECURITY

WHEREAS ____________________________ (Name and address of the supplier) (Hereinafter called “the supplier”) has undertaken, in pursuance of Purchase Order/Contract no __________________________ dated ______ to supply ______ (insert 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 ____________________________ (insert 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 there under 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 will remain in force up to ____________________________ (insert date of additional Ninety days after completion of satisfactorily warranty period in case of Performance Security and additional Ninety days after completion of satisfactorily CAMC period in case of CAMC security) and any demand in respect thereof should reach the Bank not later than the above date.

………………………………………
(Signature with date of the authorized officer of the Bank)
…………………………………………………
Name and designation of the officer
…………………………………………………
Seal, name & address of the Bank and address of the Branch
SECTION XIV: CONTRACT FORMS (A&B)
FORM - A

CONTRACT FORM FOR SUPPLY, INSTALLATION, COMMISSIONING, HANDBING OVER, TRIAL RUN, TRAINING OF OPERATORS & WARRANTY OF GOODS

UTKAL UNIVERSITY
VANI VIHAR
BHUBANESWAR-751 004

Contract No ____________________________ dated __________

To

(insert name of Supplier with address)

This is in continuation to this office’s Notification of Award No. ____________________________ dated __________

1. Name & address of the Supplier: ___________________________________________________

2. Advertised Tender Documents No.: ____________________________ and subsequent Amendment No.__________________________, dated ________ (if any), issued by the Purchaser

3. Supplier’s Bid No.__________________________ dated ________ and subsequent communication(s) No.__________________________ dated ________ (if any), exchanged between the supplier and the purchaser in connection with this Tender Document.

4. In addition to this Contract Form, the following documents etc, which are included in the Tender Documents mentioned under paragraphs 2 and 3 above, shall also be deemed to form and be read and construed as integral part of this contract:

I. General Conditions of Contract;
II. Special Conditions of Contract;
III. List of Requirements;
IV. Technical Specifications;
V. Quality Control Requirements;
VI. Tender Acceptance Form;
VII. Price Schedule(s);
VIII. Manufacturers Authorisation Form (if applicable);
IX. Purchaser’s Notification of Award

Note: The words and expressions used in this contract shall have the same meanings as are respectively assigned to them in the conditions of contract referred to above. Further, the definitions and abbreviations incorporated under clause 1 of Section II – “General Instructions to Bidders” of the Tender Document shall also apply to this contract.

5. Some terms, conditions, stipulations etc. out of the above-referred documents are reproduced below for ready reference:
Brief particulars of the goods and services which shall be supplied/provided by the supplier are asunder:

<table>
<thead>
<tr>
<th>Schedule No.</th>
<th>Brief description of goods/services</th>
<th>Accounting unit</th>
<th>Quantity to be supplied</th>
<th>Unit Price</th>
<th>Total price</th>
<th>Terms of delivery</th>
</tr>
</thead>
</table>

Any other additional services (if applicable) and cost thereof: ___________________________

Total value (in figure)__________________ (In words) ___________________________

(ii) Delivery schedule: ___________________________

(iii) Details of Performance Security required: ___________________________

(v) Destination and despatch instructions: ___________________________

(vi) Consignee: ___________________________

6. Warranty clause:
7. Payment terms:

______________________________

(Signature, name and designation of the Purchaser authorized official)
For and on behalf of Utkal University, Bhubaneswar

Received and accepted this contract

______________________________

(Signature, name and address of the supplier’s executive duly authorized to sign on behalf of the supplier)

For and on behalf of ___________________________

(Insert Name and address of the supplier)

(Seal of the Supplier)
Date: ___________________________
Place: ___________________________
CONTRACT FORM – B

CONTRACT FORM FOR COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT (CAMC)

Comprehensive Annual Maintenance Contract No. ____________________________
Dated____________________

Between

Registrar, Utkal University, Bhubaneswar

And

(Insert Name & Address of the Supplier)

Reference: Contract/ Purchase Order No. ____________________________ dated ____________ for supply, installation & commissioning, Training and CAMC of goods & services

In continuation to the above referred Contract/Purchase Order, the Contract of Comprehensive Annual Maintenance Contract is hereby concluded as under:

In continuation to the above referred Contract/Purchase Order, the Contract of Comprehensive Annual Maintenance Contract is hereby concluded as under:

<table>
<thead>
<tr>
<th>Schedules No.</th>
<th>Brief description of goods</th>
<th>Quantity (Nos.)</th>
<th>CAMC Cost for Each Unit year wise in Rs</th>
<th>GST Value in Rs (___%)</th>
<th>Total CAMC Cost for 5 Years with GST [(4a+4b+4c+4d+4e) + (5)]</th>
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Total value (in figure)________________________ (In words)______________________________

b) The CAMC commence from the date of expiry of all obligations under Warranty i.e. From_________________________(date of expiry of Warranty) and will expire on_________________________(date of expiry form)

c) The cost of Annual Comprehensive Maintenance Contract (CMC) which includes preventive maintenance, labour and spares, after satisfactory completion of Warranty period as contained in the above referred contract on yearly basis for complete equipment as per contract including Turnkey Work (if any).
d) There will be 95% uptime warranty during CAMC period on 24 (hrs) X 7 (days) X 365 (days) basis, with penalty, to extend CAMC period by double the downtime period and other penalty as per contract.

e) During CAMC period, the supplier shall visit at each consignee’s site for preventive maintenance including testing and calibration as per the manufacturer’s service/technical/operational manual. The suppliers shall visit each consignee site as recommended in the manufacturer’s manual, but at least once in 3 months commencing from the date of the successful completion of warranty period for preventive maintenance of the goods.

f) All software updates should be provided free of cost during CAMC period.

g) The Bank Guarantee valid till [fill the date] 3 months after expiry of entire CAMC period] for an amount of Rs. [fill amount] equivalent to 2.5% of the cost of the equipment as per contract] shall be furnished in the prescribed format given in Section XIV of the Tender Document, along with the signed copy of CAMC with an application of 21 (twenty-one) days of start of CAMC failing which the Performance Security (15% of the contract value) submitted shall be en-cashed payable to the Purchaser/Consignee.

h) If there is any lapse in the performance of the CAMC as per contract, the proceeds Annual CAMC Bank Guarantee shall be forfeited and their bad performance will be considered while awarding future contracts.

i) Payment terms: The payment of CAMC will be made against the bills raised by the supplier on six monthly basis after satisfactory completion of said period, duly certified by the concerned User Department. The payment will be made in Indian Rupees.

(Signature, name and designation of the Store Officer/ASO of the Purchaser)

(Signature, name and designation of the F&CAO of the Purchaser)
For and on behalf of Registrar, Utkal University, Bhubaneswar

(Signature, name and designation of the supplier’s executive duly authorized to sign on behalf of the supplier)
For and on behalf of __________________________

(Insert Name and address of the supplier)
(Signature, name and address of the supplier’s executive duly authorized to sign on behalf of the supplier)
For and on behalf of __________________________

(Seal of the Supplier)
Date: __________________________
Place: __________________________

Received and accepted this contract

(Signature, name and address of the supplier’s executive duly authorized to sign on behalf of the supplier)
For and on behalf of __________________________

(Insert Name and address of the supplier)

Note: - The contract will be prepared on Non-judicial Stamp paper (currently of value of Rs. 100).
SECTION XV: CONSIGNEE RECEIPT CERTIFICATE  
(To be given by consignee’s authorized representative)

The following store(s) has/have been received in good condition:

1) Contract/Purchase Order No. & date : __________________________

2) Supplier's Name : _____________________________________________

3) Consignee’s Name & Address:____________________________________

4) Name of the item supplied:________________________________________

5) Quantity Supplied:_______________________________________________

6) Date of Receipt by the Consignee:________________________________

7) Signature of Authorized Representative of Consignee with date: ______

8) Name and designation of Authorized Representative of Consignee:_____

9) Seal of the Consignee:___________________________________________
SECTION XVI: CONSIGNEE ACCEPTANCE CERTIFICATE

(To be given by consignee’s authorized representative)

1 This is to certify that the goods as detailed below have been received in good conditions along with all the standard and special accessories in accordance with the contract. The same has been installed and accepted.

1) Contract/Purchase Order No. & date: ________________________________

2) Supplier’s Name: ________________________________________________

3) Consignee’s Name & Address: _____________________________________

4) Name of the item Supplied: _________________________________________

5) Quantity Supplied: ________________________________________________

6) Date of Receipt by the Consignee: _________________________________

7) Date of Receipt by the Consignee: _________________________________

8) The supplier has fulfilled its contractual obligations satisfactorily
   OR
   The supplier has failed to fulfill its contractual obligations with regard to the following:
   a) 
   b) 
   c) 
   d) 

9) The amount of recovery on account of failure of the supplier to meet his contractual obligations is ____________ (here indicate the amount).

10) Signature of Authorized Representative of Consignee with date: ________

11) Name and designation of Authorized Representative of Consignee: ________

12) Seal of the Consignee: ____________________________________________

SECTION XVII: COMPLIANCES TO THE TECHNICAL SPECIFICATIONS
<table>
<thead>
<tr>
<th>S.No.</th>
<th>Item Code</th>
<th>Name of the item</th>
<th>Technical Specification as specified in RFP</th>
<th>Technical Specification of the Quoted Item</th>
<th>Technical Specification matched or not matched</th>
<th>Remarks</th>
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Note: If this sheet is not sufficient to accommodate the bid details, an additional sheet(s) containing the same proforma (with seal and signature of the Bidder) may be used.

Signature with date and seal