

BID DOCUMENT

(e - Procurement)

Project

Supply, Installation, Testing and Commissioning of Nano Lithography System for 3D Nano and Large Area Opto-electronics device fabrication and Characterization under SATHI-BHU project at (CDC Building) in Banaras Hindu University, Varanasi



**Issued On:
17-12-2019**

**BANARAS HINDU UNIVERSITY
VARANASI-221005, INDIA**

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Checklist for Bid/Tender Submission

(The following check-list must be filled in and submitted with the bid documents)

| Sr. No. | Particulars | Yes/No |
|------------------|--|--------|
| 1 | Have you attached the techno commercial unpriced bid form duly filled in appropriately? | |
| 2 | Have you attached a copy of the last audited balance sheet of your firm | |
| 3 | Have you attached the details of the income tax clearance certificate, proof of manufacturing unit/ dealership letter/ general order suppliers and copy of Central / State sales tax registration certificate? | |
| 4 | Have you attached the copies of relevant work orders from Govt. Depts. / PSUs and Central Autonomous Bodies? | |
| 5 | EMD: Have you submitted EMD asked for (as specified in BDS). | |
| 6 | Have you submitted samples of all items indicated in the respective schedule of requirements at the address of tender inviting authority within due date. | |
| 7 | Have you enclosed the schedule of requirement indicating the make offered without indicating the pricing components along with the techno commercial unpriced bid? | |
| 8 | Have you submitted the bids both techno commercial unpriced and priced bid separately for each tender? | |
| 9 | Have you enclosed the statement of deviations from financial terms and conditions, if any? | |
| 10 | Bidder has to attach a Technical compliance sheet confirming to technical specification indicating the page numbers of catalogue, If there is any deviation, the same may be mentioned clearly in compliance sheet | |
| 11 | The bidder has to attached all the certificates, copy of previously executed orders with satisfactory performance certificate from users | |
| Price Bid | | |
| 1 | Have you signed and attached the priced bid form? | |
| 2 | Have you attached the schedule of requirements duly priced? | |

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Part-1

Bidding Procedures

Section I: Instructions for Online Bid Submission

Instructions to the Bidders to submit the bids online through the Central Public Procurement Portal for e Procurement at <https://eprocure.gov.in/eprocure/app>.

1. Possession of valid Digital Signature Certificate (DSC) and enrollment/registration of the contractors/bidders on the e-Procurement/e-tender portal are prerequisite for e-tendering.
2. Bidder should register for the enrollment in the e-Procurement site using the “Online Bidder Enrollment” option available on the home page. Portal enrollment is generally free of charge. During enrollment/registration, the bidders should provide only valid and true information including valid email id. All the correspondence shall be made directly with the contractors/bidders through email id as registered.
3. Bidder need to login to the site through their user ID/ password chosen during enrollment/registration.
4. Then the Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by SIFY/TCS/nCode/eMudra or any other Certifying Authority recognized by Controller of Certifying Authorities (CCA) India on eToken/SmartCard, should be registered.
5. The registered DSC only should be used by the bidder in the transactions and should ensure safety of the same.
6. Contractor/Bidder may go through the tenders published on the site and download the tender documents/schedules for the tenders.
7. After downloading / getting the tender document/schedules, the Bidder should go through them carefully and then submit the documents as required, otherwise bid will be rejected.
8. Any clarifications may be sought online through the tender site, through the contact details or during pre-bid meeting if any. Bidder should take into account the corrigendum if any published before submitting the bids online.
9. Bidder may log in to the site through the secured login by the user id/ password chosen during enrolment/registration and then by submitting the password of the e-Token/Smartcard to access DSC.
10. Bidder may select the tender in which he/she is interested in by using the search option and then move it to the ‘my tenders’ folder.
11. From my tender folder, he may select the tender to view all the details uploaded there.

12. It shall be deemed that the bidder has read and understood all the terms and conditions before submitting the offer. Bidder should go through the tender schedules carefully and upload the documents as asked; otherwise, the incomplete bid shall stand rejected.
13. Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document/schedule and ordinarily it shall be in PDF/xls/rar/jpg/dwf formats. If there is more than one document, all may be clubbed together and provided in the requested format. Bidders Bid documents may be scanned with 100 dpi with black and white option. It is advisable that each document to be uploaded through online for the tenders should be less than 2 MB. If any document is more than 2MB, it can be reduced through zip/rar and the same if permitted may be uploaded. The file size being less than 1 MB the transaction uploading time will be very fast.
14. The Bidders can update well in advance, the documents such as certificates, annual report details etc., under “My Space option” and these can be selected as per tender requirements and then send along with bid documents during bid submission. This will facilitate the bid submission process faster by reducing upload time of bids.
15. Bidder should submit the Tender Fee/ EMD as specified in the tender. The hard copy should be posted/couriered/given in person to the Tender Inviting Authority, within bid submission due date and time as indicated in the tender. Scanned copy of the instrument should be uploaded as part of the offer.
16. While submitting the bids online, the bidder shall read the terms and conditions and may accept the same to proceed further to submit the bid packets.
17. The bidder has to select the payment option as offline to pay the Tender FEE/ EMD as applicable and enter details of the instruments.
18. The details of the DD/any other accepted instrument, physically delivered, should tally with the details available in the scanned copy and the data entered during bid submission time, otherwise submitted bid shall not be acceptable or liable for rejection.
19. The bidder has to digitally sign and upload the required bid documents one by one as indicated. Very act of using DSC for downloading the bids and uploading their offers shall be deemed to be a confirmation that they have read, understood and agreed with all clauses of the bid document including General conditions of contract without any exception.
20. The bidder has to upload the relevant files required as indicated in the cover content. In case of any irrelevant files, the bid may be rejected.
21. If the price bid format is provided in a spread sheet file like BoQ_XXXX.xls, the rates offered should be entered in the allotted space only and uploaded after filling the relevant columns. The Priced-bid/BOQ template shall not be modified / replaced by the bidder; else the bid submitted is liable to be rejected for the tender.
22. The bidders are advised to submit the bids through online e-tendering system to the Tender Inviting Authority (TIA) well before the bid submission due date and time (as

per Server System Clock). The TIA shall not be held responsible for any delay or the difficulties faced during the submission of bids online by the bidders.

23. After the bid submission (i.e. after Clicking “Freeze Bid Submission” in the portal), the acknowledgement number indicated by the system should be printed by the bidder and kept as a record of evidence for online submission of bid for the particular tender and also be used as entry pass to participate in the bid opening.
24. The time settings fixed in the server side and displayed at the top of the tender site, shall remain valid for all actions of requesting, bid submission, bid opening etc., in the e-Tender system. The bidders should follow such time during bid submission.
25. All the data being entered by the bidders would be encrypted using Public Key Infrastructure (PKI) encryption techniques to ensure the secrecy of the data. The data entered is not retrievable by unauthorized persons during the bid submission and until the time of bid opening by any person.
26. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid openers’ public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.
27. The confidentiality of the bids is maintained with the use of Secured Socket Layer (SSL) 128 bit encryption technology. Data storage encryption of sensitive fields is done.
28. The bidder should logout of the tendering system using the normal logout option available at the top right hand corner and not by selecting the (X) exit option in the browser.
29. For any queries regarding e-Tendering process, the bidders may contact at address as provided in the tender document. Parallely for any further queries, the bidders are advised to contact over phone: **1-800-233-7315** or send an e-mail to – cppp-nic@nic.in.

Section II: Instructions to Bidders

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Section II. Instructions to Bidders

A. General

- 1. Scope of Bid**
 - 1.1 Scope of Work :

Supply, Installation, Testing and Commissioning of **Nano Lithography System for 3D Nano and Large Area Opto-electronics device fabrication and Characterization at CDC Building in Banaras Hindu University** as per the detailed Technical Specifications.
 - 1.2 Throughout these Bidding Documents unless the context otherwise requires:
 - a. “in writing” means communicated in written form (e.g. by mail, e-mail, fax, telex) with proof of receipt;
 - b. “singular” means “plural” and vice versa; and
 - c. “day” means calendar day.

- 2. Corrupt and Fraudulent Practices**
 - 2.1 The Purchaser requires compliance with its policy in regard to corrupt and fraudulent practices as set forth in Section V.
 - 2.2 Further in pursuance of this policy, Bidder shall permit and cause its agents (whether declared or not), sub-contractors, sub-consultants, service providers or suppliers to provide access to purchaser to all the accounts, records and other documents relating to submission of the applicant, bid submission (in case prequalified), and contract performance (in case of award), to inspect and to have them audited by auditors appointed by the purchaser.

- 3. Eligible Bidders**
 - 3.1 A Bidder may be a firm, a company, a limited liability partnership (LLP), a government-owned entity or any combination of such entities in the form of a joint venture (JV) under an existing agreement or with the intent to enter into such an agreement supported by a letter of intent.
 - 3.2 In the case of a joint venture, all members shall be jointly and severally liable for the execution of the contract in accordance with the Contract terms. The JV shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the members of the JV during the bidding process and during the contract execution in the event the JV is awarded the contract.
 - 3.3 A Bidder shall not have a conflict of interest. Any Bidder found to have a conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest for the purpose of this bidding process, if the Bidder:
 - a. directly or indirectly controls, is controlled by or is under common control with another Bidder; or

- b. receives or has received any direct or indirect subsidy from another Bidder; or
- c. has the same legal representative as another Bidder; or
- d. has a relationship with another Bidder, directly or through common third parties, that puts it in a position to influence the bid of another Bidder, or influence the decisions of the Purchaser regarding this bidding process; or
- e. participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid shall result in the disqualification of all Bids in which such Bidder is involved. This, however does not limit the inclusion of the same subcontractor in more than one bid; or
- f. any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the works that are the subject of the bid; or
- g. any of its affiliates has been hired (or is proposed to be hired) by the Purchaser for the contract implementation; or
- h. would be providing goods, works, or non-consulting services resulting from or directly related to consulting services for the preparation or implementation of the project that it provided or was provided by any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm; or
- i. has a close business or family relationship with a professional staff of the Purchaser (or of the project implementing agency, or of a recipient of a part of the loan) who:
 - (i) are directly or indirectly involved in the preparation of the bidding documents or specifications of the contract, and/or the bid evaluation process of such contract; or
 - (ii) would be involved in the implementation or supervision of such contract.

3.4 A foreign firm and individual may be ineligible if as a matter of law or regulations, India prohibits commercial relations with the country of bidder.

3.5 A Bidder shall provide such evidence of eligibility satisfactory to the Purchaser, as the Purchaser shall reasonably request.

3.6 As per the latest of Govt of India policies, all the benefits applicable under tendering process and purchase preferences will be passed on to the respective MSME/Make in India/Start-up etc bidders subject to producing the valid certificates.

B. Contents of Bidding Document

4 Sections of Bidding Document

4.1 The Bidding Documents consist of Parts 1, 2 ,3 and 4, which include all the Sections indicated below, and should be read in conjunction with any Addenda if any, issued.

Part 1: Bidding Procedures

- Section I. Instructions for Online Bid Submission
- Section II. Instructions to Bidders
- Section III. Bid Data Sheet (BDS)
- Section IV. Prequalification
- Section V. Policy of University against the Corrupt and fraudulent Practices

Part 2: Supply Requirements

- Section VI. Schedule of Requirements

Part 3: Contract

- Section VII. General Conditions of Contract
- Section VIII. Special Conditions of Contract

Part 4: Bidding and Contract Forms

- Section IX. Bidding Forms
- Section X. Contract Forms

4.2 The Invitation for Bids issued by the Purchaser is not part of the Bidding Document.

4.3 Unless obtained directly from the Purchaser, the Purchaser is not responsible for the completeness of the document, responses to requests for clarification, the Minutes of the pre-Bid meeting (if any), or Addenda to the Bidding Document. In case of any contradiction, documents obtained directly from the Purchaser shall prevail.

4.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Documents and to furnish with its Bid all information or documentation as required by the Bidding Documents.

5 Clarification of

5.1 A Bidder requiring any clarification of the Bidding Document

Bidding Documents, Site Visit, Pre-Bid Meeting

shall contact the Purchaser in writing at the Purchaser's address specified in the BDS or raise its enquiries during the pre-bid meeting if provided. The Purchaser will respond in writing to any request for clarification, provided that such request is received prior to the deadline for submission of bids within a period specified in the BDS. The Purchaser shall forward copies of its response to all Bidders who have acquired the Bidding Documents, including a description of the inquiry but without identifying its source. If so specified in the BDS, the Purchaser shall also promptly publish its response at the web page identified in the BDS. Should the clarification results in changes to the essential elements of the Bidding Documents, the Purchaser shall amend the Bidding Documents following the due procedure.

- 5.2 If so specified in the BDS, the Bidder is advised to visit and examine the project site and obtain for itself on its own responsibility all information that may be necessary for preparing the bid and entering into a contract for procurement of Goods. The costs of visiting shall be at the Bidder's own expense.
- 5.3 The Bidder and any of its personnel or agents shall be granted permission by the Purchaser to enter upon its premises and lands upon the express condition that the Bidder, its personnel, and agents shall indemnify the Purchaser against all liability in respect thereof.
- 5.4 If so specified in the BDS, the Bidder's designated representative is invited to attend a pre-bid meeting. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.
- 5.5 The Bidder is advised to submit any questions in writing to reach the Purchaser not beyond one week preceding the meeting.
- 5.6 Minutes of the pre-bid meeting, if applicable, including the text of the questions asked by Bidders, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Documents. Any modification to the Bidding Documents that may become necessary as a result of the pre-bid meeting shall be made by the Purchaser exclusively through the issue of an addendum and not through the minutes of the pre-bid meeting. Absence in the pre-bid meeting shall not be a cause for disqualification of a Bidder.

6 Amendment of Bidding Document

- 6.1 At any time prior to the deadline for submission of bids, the Purchaser may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective

bidder, modify the bidding documents by corrigendum. In case of e-procurement, corrigendum / amendment shall be published on <http://eprocure.gov.in/eprocure/app>.

- 6.2 Any addendum issued shall be part of the Bidding Documents and shall be communicated in writing to all who have obtained the Bidding Documents from the Purchaser. The Purchaser shall also promptly publish the addendum on the Purchaser's web page.
- 6.3 The Purchaser may, at its discretion to give prospective Bidders reasonable time in which to take an addendum into account in preparing their bids, extend the deadline for the submission of bids.

C. Preparation of Bids

- 7 Cost of Bidding** 7.1 The Bidder shall bear all costs associated with the preparation and submission of its bid, and the Purchaser shall not be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.
- 8 Language of Bid** 8.1 The Bid, as well as all correspondence and documents relating to the bid exchanged by the Bidder and the Purchaser, shall be written in the language specified in the BDS. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages into the language specified in the BDS, in which case, for purposes of interpretation of the Bid, such translation shall govern.
- 9 Documents Comprising the Bid** 9.1 The tender/Bid shall be submitted online in two part, viz., Technical Bid and Commercial Bid.
- 9.1.1 **TECHNICAL BID**
- The following documents are to be scanned and uploaded as part of the Technical Bid as per the tender document:
- (a) Scanned copy of Tender Forms (Techno Commercial Un-Priced Bid) and Tender Acceptance Letter);
 - (b) Scanned copy of the completed schedules,
 - (c) Scanned copy of Bid Security or copy of proof for submission of Tender Document Fee/ Earnest Money Deposit etc.;
 - (d) Scanned copy of written confirmation authorizing the signatory of the Bid to commit the Bidder;
 - (e) Scanned copy of documentary evidence
 - (i) establishing the Bidder's qualifications to perform the contract if its bid is accepted and

- (ii) the Bidder's eligibility to bid;
- (f) Scanned copy of
 - (i) documentary evidence, that the Goods and Related Services to be supplied by the Bidder are of eligible origin and
 - (ii) conform to the Bidding Documents, and
 - (iii) any other document required in the BDS;
- (g) Scanned copy of Pre-qualification Details as per Section-IV like PAN/TIN/Sales Tax / Service Tax etc.
- (h) Technical Bid.
- (i) Bidder has to attach a Technical compliance sheet confirming to technical specification indicating the page numbers of catalogue, terms and conditions of supply and installation, like payment terms, delivery time, experience, turnover etc. If there is any deviation, the same may be mentioned clearly in compliance sheet.
- (j) The bidder has to attached all the certificates, copy of previously executed orders with satisfactory performance certificate from users.
- (k) The bidder has to attach the certificate that quoted of product is of latest available technology and also to attach the print of such information on OEMs website.
- (l) The bidder has to quote for all the items mentioned in schedule of requirement in clear terms. Bids quoting vague terms like at actual, as applicable, free of cost etc will be treated as non responsive.

All the original documents as well as the original payment instrument like Demand Draft/Bank Guarantee /Pay order or banker cheque of any scheduled bank against Tender Fee/EMD, samples as specified in this tender document have to be sent to the address of the Purchaser mentioned in Bid Data Sheet (BDS) by post/speed post/courier/by hand on or before bid Submission closing date & time. Beyond that the tender shall be summarily rejected without assigning any reason.

9.1.2 **COMMERCIAL BID**

The commercial bid comprises of :

- (i) Scanned copy of Tender Form (Price Bid)
- (ii) Price bid in the form of BoQ_XXXX.xls.
- (iii) Scanned copy of item wise breakup of price bid.

The Price bid format is provided as BoQ_XXXX.xls along with this Tender Document at

<http://eprocure.gov.in/eprocure/app>. Bidders are advised to download this BoQ_XXXX.xls and quote their offer/rates in the prescribed column. Bidders can quote Basic Price in INR or CURRENCY (for other than INR) but it is mandatory to quote taxes/levies in INR only, in the prescribed column and upload the same in the commercial bid.

- 9.2 In addition to the above requirements, bids submitted by a JV shall include a copy of the Joint Venture Agreement entered into by all members. Alternatively, a letter of intent to execute a Joint Venture Agreement in the event of a successful bid shall be signed by all members and submitted with the bid, together with a copy of the proposed Agreement, there to.
- 9.3 The Bidder shall furnish in the Tender Forms information on commissions and gratuities, if any, paid or to be paid to agents or any other party relating to this Bid.

10 Tender Forms(Technical and Price) and Price Schedule(BOQ)

- 10.1 Tender Forms and Price Schedules (Bill of Quantity-BOQ) shall be prepared using the relevant forms furnished in Section IX, Bidding Forms and BOQ provided. The forms must be completed without any alterations to the text, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested.

11 Alternative Bids

- 11.1 Unless otherwise specified in the BDS, alternative bids shall not be considered.

12 Bid Prices and Discounts

- 12.1 The prices and discounts quoted by the Bidder in the Tender Forms and in the Price Schedules (BOQ) shall conform to the requirements specified as under.
- (a) All lots (contracts) and items must be listed and priced separately in the Price Schedules (BOQ).
 - (b) The price to be quoted in the Tender Forms shall be the total price of the bid, excluding any discounts offered.
 - (c) The Bidder shall quote any discount and indicate the methodology for their application in the Tender Forms.
 - (d) Prices quoted by the Bidder shall be fixed during the Bidder's performance of the Contract and not subject to variation on any account, unless otherwise specified in the BDS. A bid submitted with an adjustable price quotation shall be treated as non-responsive and shall be rejected. However, in accordance with the BDS, prices quoted by the Bidder shall be subject to adjustment during the performance of the Contract, a bid submitted with a fixed price quotation shall not be rejected, but the price

adjustment shall be treated as zero.

- 12.2 If so bids are being invited for individual lots (contracts) or for any combination of lots (packages). Unless otherwise specified in the BDS, prices quoted shall correspond to 100 % of the items specified for each lot and to 100% of the quantities specified for each item of a lot. Bidders wishing to offer discounts for the award of more than one Contract shall specify in their bid the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Discounts shall be submitted provided the bids for all lots (contracts) are opened at the same time.
- 12.3 Prices shall be quoted as specified in each Price Schedule (BOQ) as provided. The dis-aggregation of price components is required solely for the purpose of facilitating the comparison of bids by the Purchaser. This shall not in any way limit the Purchaser's right to contract on any of the terms offered. In quoting prices, the Bidder shall be free to use transportation through carriers registered in any eligible country. Similarly, the Bidder may obtain insurance services from any eligible country. Prices shall be entered in the following manner:
- (a) For Goods manufactured in India:
 - (i) the price of the Goods quoted EXW (ex-works, ex-factory, ex warehouse, ex showroom, or off-the-shelf, as applicable), including all customs duties and sales and other taxes already paid or payable on the components and raw material used in the manufacture or assembly of the Goods;
 - (ii) any sales tax/VAT and other taxes payable on the Goods, if the contract is awarded to the Bidder; and
 - (iii) the price for inland transportation, insurance, and other local services required to convey the Goods to their final destination (Project Site) as specified in the BDS.
 - (b) For Goods manufactured outside India, to be imported:
 - (i) the price of the Goods quoted under Incoterms®2010 up to named place of destination in India as specified in the BDS;
 - (ii) the price for inland transportation, insurance, and other local services required to convey the Goods from the named place of destination to their final destination (Project Site) specified in the BDS;
 - (c) For Goods manufactured outside India, already imported:
 - (i) the price of the Goods, including the original import value of the Goods; plus any mark-up (or rebate); plus any other related local cost, and

custom duties and other import taxes already paid or to be paid on the Goods already imported.

- (ii) the custom duties and other import taxes already paid (need to be supported with documentary evidence) or to be paid on the Goods already imported;
 - (iii) the price of the Goods, obtained as the difference between (i) and (ii) above;
 - (iv) any sales and other taxes which will be payable on the Goods if the contract is awarded to the Bidder; and
 - (v) the price for inland transportation, insurance, and other local services required to convey the Goods from the named place of destination to their final destination (Project Site) specified in the BDS.
- (d) for Related Services, other than inland transportation and other services required to convey the Goods to their final destination, whenever such Related Services are specified in the Schedule of Requirements:
- (i) the price of each item comprising the Related Services (inclusive of any applicable taxes).

13 Currencies of Bid and Payment

13.1 The currency(ies) of the bid and the currency(ies) of payments shall be as specified in the BDS. The Bidder shall quote in Indian Rupees the portion of the bid price that corresponds to expenditures incurred in Indian Rupees, unless otherwise specified in the BDS.

14 Documents Establishing the Eligibility and Qualifications of the Bidder

14.1 To establish Bidder's their eligibility, Bidders shall complete the Tender Form (Techno Commercial Un-Priced Bid & Priced Bid), included in Section-IX, Bidding Forms.

14.2 The documentary evidence of the Bidder's qualifications to perform the contract if its bid is accepted shall establish to the Purchaser's satisfaction:

- (a) that, if required in the BDS, a Bidder that does not manufacture or produce the Goods it offers to supply shall submit the Manufacturer's Authorization using the form included in Section IX, Bidding Forms to demonstrate that it has been duly authorized by the manufacturer or producer of the Goods to supply these Goods in India;
- (b) that, if required in the BDS, in case of a Bidder not doing business within India, the Bidder is or will be (if awarded the contract) represented by an Agent in the country equipped and able to carry out the Supplier's maintenance, repair and spare parts-stocking obligations prescribed in the Conditions of Contract and/or Technical Specifications; and

- (c) that, the Bidder meets each of the qualification criterion.

15 Period of Validity of Bids

- 15.1 Bids shall remain valid for the period specified in the BDS after the bid submission deadline date prescribed by the Purchaser. A bid valid for a shorter period shall be rejected by the Purchaser as non-responsive.
- 15.2 In exceptional circumstances, the Purchaser may solicit the Bidder's consent to an extension of the period of validity. The request and the responses thereto shall be made in writing. A Bidder may refuse the request without forfeiting its Earnest Money Deposit (EMD). A Bidder acceding to the request will neither be required nor permitted to modify the bid.
- 15.3 Bid evaluation will be based on the bid prices without taking into consideration the above modifications.

16 Bid Security

- 16.1 The Bidder shall furnish as part of its bid, a bid security, as specified in the BDS, in original form the amount and currency as specified in the BDS.
- 16.2 If a bid security is specified, the bid security shall be a demand guarantee in any of the following forms at the Bidder's option:
- (a) an unconditional guarantee issued by a bank or financial institution (such as an insurance, bonding or surety company);
 - (b) an irrevocable letter of credit;
 - (c) a banker's cheque or Demand Draft ; or
 - (d) any other security as specified in the BDS,
- of a reputed source from an eligible country. If the unconditional guarantee is issued by a financial institution located outside India, the issuing financial institution shall have a correspondent financial institution located in India to make it enforceable. The bid security shall be valid for forty five (45) days beyond the original validity period of the bid, or beyond the extended period.
- 16.3 If a Bid Security is specified, any bid not accompanied by a substantially responsive Bid Security, shall be rejected by the Purchaser as non-responsive.
- 16.4 If a Bid Security is specified, the Bid Security of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder's signing the contract and furnishing the Performance Security.
- 16.5 The Bid Security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the contract and furnished the required performance

security.

16.6 The Bid Security of the bidder may be forfeited or the Bid Securing Declaration executed:

(a) if he withdraws from the bid during the period of bid validity specified by the Bidder on the Tender Forms, or any extension thereto provided by the Bidder ; or

(b) if he being successful Bidder fails to:

(i) sign the Contract; or

(ii) furnish a performance security.

16.7 The bid security of a JV must be in the name of the JV that submits the bid. If the JV has not been legally constituted into a legally enforceable entity at the time of bidding, the bid security shall be in the names of all members as named in the letter of intent.

D. Submission and Opening of Bids

- | | |
|--|--|
| 17 Sealing and Marking of Bids | 17.1 The Bidder shall submit the bids electronically, through the e-procurement system (http://eprocure.gov.in/eprocure/app). Any document submitted through any other means will not be considered as part of the Bid except for the Originals as asked for in this tender. |
| 18 Deadline for Submission of Bids | 18.1 The Purchaser may, at its discretion, extend the deadline for the submission of bids by amending the Bidding Documents, in which case all rights and obligations of the Purchaser and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended. |
| 19 Late Bids | 19.1 The e-Procurement system would not allow any late submission of bids after due date and time as per server system. After electronic online proposal submission, the system generates a unique identification number which is time stamped. This shall be treated as acknowledgement of the proposal submission |
| 20 Withdrawal, Substitution, and Modification of Bids | 20.1 A Bidder may withdraw, substitute, or modify its bid on the e-procurement system before the date and time specified but not beyond. 20.2 No bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Tender Forms or any extension thereof Modification/Withdrawal of the Bid sent through any other means shall not be considered by the Purchaser. |
| 21 Bid Opening | 21.1 The Purchaser shall open the bids as per electronic bid |

opening procedures specified in Central Public Procurement Portal (CPPP) at the date and time specified. Bidders can also view the bid opening by logging on to the e-procurement system. Specific bid opening procedures are laid down at <http://eprocure.gov.in/eprocure/app> under the head “Bidders Manual Kit”. The tenderer/bidder will be at liberty to be present either in person or through an authorized representative at the time of opening of the Bid or they can view the bid opening event online at their remote end. Price Bids of only those tenderers shall be opened whose technical bids qualify.

- 21.2 The withdrawn bid will be available in the system therefore will be considered, If bidder once withdraws the bid then he will not be able to participate in the respective tender again. Modification to the bid shall be opened and read out with the corresponding bid. Only bids that are opened and read out at bid opening shall be considered further.
- 21.3 The Purchaser shall prepare a record of the bid opening that shall include; the name of the Bidder; whether there is a withdrawal, substitution, or modification; the Bid Price including any discounts and alternative bids; and the presence or absence of a bid security, if one was required. The Bidders’ representatives who are present in the office of the Purchaser to witness the bid opening shall be requested to sign the record. The omission/refusal of a Bidder’s signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be made available on the e-procurement system.

E. Evaluation and Comparison of Bids

- 22 Confidentiality**
 - 22.1 Information relating to the evaluation of bids and recommendation of contract award shall not be disclosed to bidders or any other persons not officially concerned with the bidding process until information on Contract Award is communication to all Bidders.
 - 22.2 No Bidder shall contact the purchaser on any matter relating to its bid from the time of the bid opening to the time the contract is awarded. If the Bidder wishes to bring additional information to the notice of the Purchaser it should be done in writing.
 - 22.3 Any effort by a Bidder to influence the purchaser in its decisions on bid evaluation, bid comparison or contract award decisions may result in rejection of the Bidder’s bid.

- 23 Clarification of Bids**
 - 23.1 To assist in the examination, evaluation, comparison of the bids, and qualification of the Bidders, the Purchaser may, at its discretion, ask any Bidder for a clarification of its Bid. Any clarification submitted by a Bidder in respect to its Bid

and that is not in response to a request by the Purchaser shall not be considered. The Purchaser's request for clarification and the response shall be in writing. No change, including any voluntary increase or decrease, in the prices or substance of the Bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Purchaser in the Evaluation of the bids.

23.2 If a Bidder does not provide clarifications of its bid by the date and time set in the Purchaser's request for clarification, its bid may be rejected.

24 Determination of Responsiveness

24.1 The Purchaser's determination of a bid's responsiveness is to be based on the contents of the bid itself.

24.2 A substantially responsive Bid is one that meets the requirements of the Bidding Documents without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that:

(a) if accepted, would

(i) affect in any substantial way the scope, quality, or performance of the Goods and Related Services specified in the Contract; or

(ii) limit in any substantial way, inconsistent with the Bidding Documents, the Purchaser's rights or the Bidder's obligations under the Contract; or

(b) if rectified, would unfairly affect the competitive position of other bidders presenting substantially responsive bids.

24.3 The Purchaser shall examine the technical aspects of the bid submitted in accordance with instructions specified in tender document, in particular, to confirm that all requirements enumerated in the 'Schedule of Requirements' Section-VI have been complied with, without any material deviation or reservation or omission.

24.4 If a bid is not responsive to the requirements of Bidding Documents, it shall be rejected by the Purchaser and may not subsequently be made responsive by correction of the material deviation, reservation or omission.

25 Conversion to Single Currency

25.1 For evaluation and comparison purposes, the currency(ies) of the Bid shall be converted in a single currency as specified in the BDS and conversion shall be taken as per rates applicable on the opening of technical .

26 Margin of Preference

26.1 Unless otherwise specified in the BDS, a margin of preference shall not apply.

27 Evaluation of Bids

27.1 The Purchaser shall use the criteria and methodologies listed in this Clause. No other evaluation criteria or

methodologies shall be permitted.

- 27.2 To evaluate a Bid, the Purchaser shall consider the following:
- (a) evaluation will be done for Items or Lots (contracts), as specified in the BDS; and the Bid Price
 - (b) price adjustment due to discounts offered;
 - (c) converting the amount resulting from above, if relevant, to a single currency;
 - (d) price adjustment due to quantifiable nonmaterial nonconformities in;
- 27.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in bid evaluation.
- 27.4 The Purchaser's evaluation of a bid shall exclude and not take into account:
- (a) in the case of Goods manufactured in the India, sales and other similar taxes, which will be payable on the goods if a contract is awarded to the Bidder;
 - (b) in the case of Goods manufactured outside India, already imported or to be imported, customs duties and other import taxes levied on the imported Good, sales and other similar taxes, which will be payable on the Goods if the contract is awarded to the Bidder;
 - (c) any allowance for price adjustment during the period of execution of the contract, if provided in the bid.
- 27.5 The Purchaser's evaluation of a bid may require the consideration of other factors, in addition to the Bid Price quoted. These factors may be related to the characteristics, performance, and terms and conditions of purchase of the Goods and Related Services. The effect of the factors selected, if any, shall be expressed in monetary terms to facilitate comparison of bids.

28 Comparison of Bids

- 28.1 The Purchaser shall compare the evaluated prices of all substantially responsive bids established to determine the lowest evaluated bid. The comparison shall be on the basis of CIP-Carriage and Insurance Paid to (place of destination) prices for imported goods and EXW – Ex Works (named place of delivery) prices, plus cost of inland transportation and insurance to place of destination, for goods manufactured within India, together with prices for any required installation, training, commissioning and other services. The evaluation of prices shall not take into account custom duties and other taxes levied on imported goods quoted CIP and sales and similar taxes levied in connection with the sale or delivery of goods.

- 29 Qualification of the Bidder**
- 29.1 The Purchaser shall determine to its satisfaction whether the Bidder that is selected as having submitted the lowest evaluated and substantially responsive bid meets the qualifying criteria.
- 29.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder.
- 29.3 An affirmative determination shall be a prerequisite for award of the Contract to the Bidder. A negative determination shall result in disqualification of the bid, in which event the Purchaser shall proceed to the next lowest evaluated bid to make a similar determination of that Bidder's qualifications to perform satisfactorily.
- 30 Purchaser's Right to Accept Any Bid, and to Reject Any or All Bids**
- 30.1 The Purchaser reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to contract award, without thereby incurring any liability to Bidders. In case of annulment, all bids submitted and specifically, bid securities, shall be promptly returned to the Bidders.

F. Award of Contract

- 31 Award Criteria**
- 31.1 The Purchaser shall award the Contract to the Bidder whose bid has been determined to be the lowest evaluated bid and is substantially responsive to the Bidding Documents, provided the Bidder is determined to be qualified to perform the Contract satisfactorily.
- 32 Purchaser's Right to Vary Quantities at Time of Award**
- 32.1 At the time the Contract is awarded, the Purchaser reserves the right to increase or decrease the quantity of Goods and Related Services originally specified in Section VI, Schedule of Requirements, provided this does not exceed the percentages specified in the BDS, and without any change in the unit prices or other terms and conditions of the bid and the Bidding Documents.
- 33 Notification of Award**
- 33.1 Prior to the expiration of the period of bid validity, the Purchaser shall, notify the successful Bidder, in writing, that its Bid has been accepted. The notification letter (hereinafter and in the Conditions of Contract and Contract Forms called the "Letter of Acceptance") shall specify the sum that the Purchaser will pay the Supplier in consideration of the supply of Goods (hereinafter and in the Conditions of Contract and Contract Forms called "the Contract Price"). At the same time, the Purchaser shall also notify all other Bidders of the results of the bidding.
- 33.2 Until a formal Contract is prepared and executed, the

notification of award shall constitute a binding Contract.

33.3 The Purchaser shall promptly respond in writing to any unsuccessful Bidder who, after notification of award, requests in writing the grounds on which its bid was not selected.

34 Signing of Contract

34.1 Promptly after notification, the Purchaser shall send the successful Bidder the Contract Agreement.

34.2 Within twenty-eight (28) days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Purchaser.

34.3 Notwithstanding anything contained in clause 34.2, in case signing of the Contract Agreement is prevented by any export restrictions attributable to the Purchaser, or to the use of the products/goods, systems or services to be supplied, where such export restrictions arise from trade regulations from a country supplying those products/goods, systems or services, the Bidder shall not be bound by its bid, always provided however, that the Bidder can demonstrate to the satisfaction of the Purchaser that signing of the Contract Agreement has not been prevented by any lack of diligence on the part of the Bidder in completing any formalities, including applying for permits, authorizations and licenses necessary for the export of the products/goods, systems or services under the terms of the Contract.

35 Performance Security

- 35.1 Within twenty eight (28) days of the receipt of notification of award from the Purchaser, the successful Bidder, if required, shall furnish the Performance Security in accordance with the General Conditions of Contract (GCC), using for that purpose the Performance Security Form included in Section-X, Contract Forms, or another Form acceptable to the Purchaser. If the Performance Security furnished by the successful Bidder is in the form of a bond, it shall be issued by a bonding or insurance company that has been determined by the successful Bidder to be acceptable to the Purchaser. A foreign institution providing a bond shall have a correspondent financial institution located in India.
- 35.2 Failure of the successful Bidder to submit the above-mentioned Performance Security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security. In that event the Purchaser may award the Contract to the next lowest evaluated Bidder, whose bid is substantially responsive and is determined by the Purchaser to be qualified to perform the Contract satisfactorily.

Section III. Bid Data Sheet (BDS)

The following specific data for the goods to be procured shall complement, supplement, or amend the provisions in the Instructions to Bidders (ITB). In case of inconsistency, the provisions herein shall prevail over those in ITB.

| Serial No. | A. General |
|------------|---|
| 1 | The reference number of the Invitation for Bids is BHU/SATHI/EQUIP/2019-20/01 Dated: 17-12-2019 |
| 2 | The Purchaser is Coordinator, SATHI, BHU, Varanasi |
| 3 | Maximum number of members in the JV shall be: 4 |

| Serial No. | B. Contents of Bidding Documents |
|------------|--|
| 4 | For Clarification of bid purposes only, the Purchaser's address is Coordinator, SATHI, BHU, Varanasi Attention : Prof. Anil Kumar Tripathi, Director Address : Institute of Science, BHU, Varanasi. Floor/ Room number : - City : Varanasi ZIP Code : 221005 Country : India Telephone : 91-542-0000000 91-9451525811 Facsimile number : 91-542-0000000 Electronic mail address : directoris@bhu.ac.in |
| 5 | Web page : http://eprocure.gov.in/eprocure/app |
| 6 | A site visit shall not be organized by the purchaser. |
| 7 | A Pre-Bid meeting : 14.01.2020 at 11:00 AM |

| Serial No. | C. Preparation of Bids |
|------------|---|
| 8 | <p>The language of the bid is: English or Hindi.</p> <p>All correspondence exchange shall be in English or Hindi language.</p> <p>Language for translation of supporting documents and printed literature is English or Hindi.</p> |
| 9 | The Bidder shall submit the following additional documents in its bid: NA |
| 10 | Alternative Bids shall not be considered. |
| 11 | The prices quoted by the Bidder shall not be subject to adjustment during the performance of the Contract. |
| 12 | Place of Destination: CDC Building, Banaras Hindu University, Varanasi |
| 13 | Final destination (Project Site): CDC Building, Banaras Hindu University, Varanasi |
| 14 | <p>The prices shall be quoted by the bidder in : Foreign Currency of Principal's Country (Preferably in Indian Rupees)</p> <p>The Bidder is required to quote in Indian Rupees (INR), the portion of the bid price that corresponds to expenditures incurred in Indian Rupees (INR).</p> |
| 15 | Manufacturer's authorization is Required |
| 16 | After sales service is Required. |
| 17 | The bid validity period shall be 120 days . |
| 18 | <p>EMD/Bid security shall be 2 % of the estimated cost by the way of Demand Draft (DD)/Bank Guarantee (BG) in favour of the Registrar, Banaras Hindu University, Varanasi-221005 and should be valid for a period of 45 days beyond the BID validity period. All tenders received without EMD/Bank Security shall be rejected.</p> <p>TENDER FEE : NIL</p> |
| 19 | Other types of acceptable securities: NA |

| Serial No. | D. Submission and Opening of Bids |
|------------|---|
| 20 | <p>For bid submission purposes only, the Purchaser's address is Coordinator, SATHI, Banaras Hindu University, Varanasi</p> <p>Attention : Prof. Anil Kumar Tripathi</p> <p>Street Address : Director Office, Institute of Science, BHU, Varanasi.</p> <p>City : Varanasi</p> <p>ZIP/Postal Code : 221005</p> <p>Country : India</p> <p>The deadline for bid submission is:</p> <p>Date : 03.02.2020</p> <p>Time : 5:00 PM</p> <p>The electronic bidding opening procedures shall be as given in Section I-Instructions for Online Bid Submission.</p> |
| 21 | <p>The bid opening shall take place at: Committee Room, Office of the Director, Institute of Science, BHU</p> <p>Street Address : Banaras Hindu University, Varanasi</p> <p>Floor/ Room number : Committee Room</p> <p>City : Varanasi</p> <p>Country : India</p> <p>Date : 04.02.2020</p> <p>Time : 3:00 PM</p> <p>The electronic bidding opening procedures shall be as given in Section I-Instructions for Online Bid Submission.</p> |

| Serial No. | E. Evaluation and Comparison of Bids |
|------------|--|
| 22 | <p>The currency that shall be used for bid evaluation and comparison purposes to convert all bid prices expressed in various currencies into a single currency is: Indian Rupees</p> <p>The source of exchange rate shall be: Reserve Bank of India.</p> <p>The date for the exchange rate shall be: Technical bid opening date and time.</p> |
| 23 | A margin of domestic preference as latest Govt of India policies shall apply. |
| 24 | <p>Evaluation will be done for concern equipment.</p> <p><i>Note: Bids will be evaluated for each item and the Contract will comprise the item(s) awarded to the successful Bidder.</i></p> |

| Serial No. | F. Award of Contract |
|------------|---|
| 25 | <p>The maximum percentage by which quantities may be increased is: <i>NA</i></p> <p>The maximum percentage by which quantities may be decreased is: <i>NA</i></p> |

Section IV. Prequalification

| # | Qualification Criteria | Documentary proof submitted | Compliance (Page No) |
|---|---|---|----------------------|
| Criteria related to Incorporation of the Firm, Legal entity: | | | |
| 1. | The bidder should be either Original Equipment Manufacturer (OEM)/ authorized dealer/distributor specifically authorized by the OEM for at least last two financial years. The item/equipment being quoted should be of OEM (Original Equipment Manufacturers) and no non standard equipment should be quoted. The bidder should have a back-to-back agreement with the OEM to supply and support the OEM's product and solution in India. | Certificate needs to be attached | |
| 2. | The bidder shall commit in writing for a time schedule of no more than 2 months from date of placing the order to successful commissioning. | Self Certification | |
| 3. | Bidder should have at least 3 years experience in supplying of similar type of scientific instruments/equipment's/ University/ Central Govt./Research Institutes/educational organization /industries etc. | Bidder should submit the user list and letters from user regarding satisfactory' performance with the technical bid. | |
| Government Regulation | | | |
| 4. | A notarized affidavit by the firm that it has never been black-listed must be attached along with the Bid, failing which the Bid shall be rejected. | Affidavit from the Notary to be attached along with the Bid. | |
| 5. | The Bidder (not Individual) should have valid documentary proof GST Registration Number, TAN Number. | Pan and TAN Number and should be attached along with the bid | |
| Criteria related to financial viability | | | |
| 6. | The Bidder should have minimum turnover of Rs. 100 crores for last 3 financial years. The last three financial years would mean financial years 2016-17, 2017-18, 2018-19 | Certificate from a practicing Chartered accountant should be attached on his letter head confirming annual turnover during these years. | |
| 7. | The Bidder should have valid Income Tax Returns for the last three financial years and the bidding Firm should have PAN Card. | Provide documentary proof of Income Tax returns for the last three Assessment years. Provide copy of PAN card | |
| Technical Criteria | | | |
| 8. | Bidder should furnish technical compliance chart strictly as per specification given.(Annexure 'A') | Compliance of Technical specification and its deviation | |

Bidders who meet the criteria given above are subject to be disqualified, if they have made untrue or false representation in the forms, statements and attachments submitted in proof of the qualification requirements or have a record of poor performance, not properly completing the contract, inordinate delays in completion or financial failure, etc.

An undertaking has to be given by the authorized signatory of the company like Managing Director / President / Vice President or above, with evidence of board resolution to back it.

Section V. Policy of University against the Corrupt and Fraudulent Practices

University strictly adheres to its policy against corruption and requires that bidders and their agents, subagents, sub-contractors, suppliers etc. shall not indulge in any kind of corrupt practices, fraudulent practices, collusive practices, coercive practices, obstructive practices or other kinds of corruption declared as crimes under Indian law.

- a) If bidder or their agents, subagents, sub-contractors, suppliers etc. are found, directly or indirectly, involved in such practices, bid or agreement and execution thereof at any stage may be rejected or cancelled as the case may be by the University and besides it , University may initiate legal actions including civil and criminal proceeding.

For the purpose of this provision the terms are defined as follows:

- (i) “Corrupt practice” is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;¹
 - (ii) “Fraudulent Practices” is any act or omission including a misrepresentation which knowingly or recklessly made to mislead another party to obtain financial or other benefit or to avoid an obligation;²
 - (iii) “Collusive Practice” is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;³
 - (iv) “Coercive Practice” is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;⁴
 - (v) “Obstructive Practice” is deliberately destroying, falsifying, altering, or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede an investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation.
- b) Besides actions under clause (a) University may also take action to blacklist such bidder either indefinitely or for a specified period.

¹ For the purpose of this sub-paragraph, “*another party*” refers to a public official acting in relation to the procurement process or contract execution. In this context, “*public official*” includes university staff and employees of other organizations taking or reviewing procurement decisions.

² For the purpose of this sub-paragraph, “*party*” refers to a public official; the terms “*benefit*” and “*obligation*” relate to the procurement process or contract execution; and the “*act or omission*” is intended to influence the procurement process or contract execution.

³ For the purpose of this sub-paragraph, “*party*” refers to participants in the procurement process (including public officials) attempting either themselves, or through another person or entity not participating in the procurement or selection process, to simulate competition or to establish bid prices at artificial, non-competitive levels, or are privy to each other’s bid prices or other conditions.

⁴ For the purpose of this sub-paragraph, “*party*” refers to a participant in the procurement process or contract execution.

Part-2

Supply Requirements

Section VI. Schedule of Requirements

Contents

| | | |
|----|--|----|
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| 2. | List of Related Services and Completion Schedule | 36 |
| 3. | Technical Specifications | 37 |

1. List of Goods and Delivery Schedule

| Line Item N° | Description of Goods | Quantity | Physical unit | Final (Project Site) Destination as specified in BDS | Delivery (as per INCOTERMS®2010) Date | | |
|-------------------------|--|---|--|--|---|---|---|
| | | | | | Earliest Delivery Date | Latest Delivery Date | Bidder's offered Delivery date [to be provided by the bidder] |
| <i>[insert item No]</i> | <i>[insert description of Goods]</i> | <i>[insert quantity of item to be supplied]</i> | <i>[insert physical unit for the quantity]</i> | <i>[insert place of Delivery]</i> | <i>[insert the number of days following the date of effectiveness the Contract]</i> | <i>[insert the number of days following the date of effectiveness the Contract]</i> | <i>[insert the number of days following the date of effectiveness the Contract]</i> |
| 1. | Supply installation testing and commissioning of Nano Lithography System for 3D Nano and Large Area Opto-electronics device fabrication and Characterization including all component and accessories | 1.00 | Nos. | As per tender documents | Insert reasonable delivery time in days from date of PO/ opening of LC | Insert reasonable delivery time in days from date of PO/ opening of LC | |

2. List of Related Services and Completion Schedule

| Service | Description of Service | Quantity ¹ | Physical Unit | Place where Services shall be performed | Final Completion Date(s) of Services |
|----------------------------|---|--|---|---|---|
| <i>[insert Service No]</i> | <i>[insert description of Related Services]</i> | <i>[insert quantity of items to be supplied]</i> | <i>[insert physical unit for the items]</i> | <i>[insert name of the Place]</i> | <i>[insert required Completion Date(s)]</i> |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

1. If applicable

3. Technical Specifications

"Summary of Technical Specifications"

Nano Lithography System for 3D Nano and Large Area Opto-electronics device fabrication and Characterization

List of Instruments and Accessories:

1. Direct LASER Write Lithography System and accessories
2. Probe Station and accessories
3. Semiconductor Parametric Analyzer and accessories
4. Super Ink-Jet Printer and accessories
5. Four Point Probe Sheet Resistance / Resistivity Measurement System and accessories
6. Thermal Evaporation System and accessories
7. RF Sputtering System and accessories
8. RF Plasma Etching System and accessories
9. Solar Simulator Workstation and accessories
10. Electrochemical Work station and accessories
11. Fuel Cell Station and accessories
12. Spin Coater and accessories
13. Glove Box and accessories
14. Temperature Controlled Hot Plate and accessories
15. UPS - 20 KVA with 30 Minutes power backup and accessories
16. Vibration Free Table- 1.5m (l)x 0.8m(w)x 0.7m(h) with all required accessories.
17. Optical Bench- 1.5m (l)x 0.8m(w)x 0.7m(h) with all required accessories.
18. Wet Bench- 1.5m(l)x 0.8m (w)x 0.7m(h) with all required accessories.
19. Labor cost of 1 personal for 5 years is required and warranty of 5 years for all the above items.
20. Fume Hood and accessories
21. Distillation plant and accessories
22. Acid - chemical chambers and accessories
23. Dish washer for cleaning glass wafers and accessories

1. Specifications for Direct LASER Write Lithography System and accessories

| I. Pattern Writing features and alignment: | | | | | | |
|--|---|---|--------|--------|--------|--------|
| 1. | Writable area | 4 inch x 4 inch | | | | |
| 2. | Exposure Resolutions (at least four different resolutions mode should be available on the system) | Minimum feature size should be 0.8µm or less | | | | |
| | | Resolution level for different feature sizes should be: | | | | |
| | | Feature | 0.8µm | 2 µm | 4 µm | 8 µm |
| | | Resolution | 0.1 µm | 0.2 µm | 0.4 µm | 0.8 µm |
| | | Automatic selection of lens resolution through software should be possible. | | | | |
| 3. | Edge roughness | After pattern transfer, the sharpness of the side walls should be ± 500 nm or less. | | | | |
| | Multilayer and mix- | Multilayer direct-write patterning, Virtual mask | | | | |

| | | |
|---|---|---|
| 4. | and –match Lithography | aligner, with selectable automatic/manual registration for multilayer overlay. |
| | Level to level alignment accuracy | Provision of alignment marks for matching the previous layer. |
| | | Provision of matching/alignment (i.e. shift, rotation and scaling) the layers even if the design was made with another tool. |
| | Tilt compensation | System should have automatic compensation for substrate tilt (~2 degrees). Should permit patterning on non-parallel surfaces. The provided software should evaluate the tilt amount and compensate for it during the writing process. |
| Writing must be made on tilted substrates (max. 2 degrees). | | |
| 5. | Line width uniformity | ≤ 200 nm. |
| II. Scanning mode and speed: | | |
| 6. | Automatic detection of sample edges & Centering | A tool for automatic centering the pattern on small samples should be provided. |
| 7. | Write modes | Following modes are required at all resolution: <ul style="list-style-type: none"> • Beam scanning, Stage scanning, Vector scanning, Contour writing and Manual writing. Additional modes available should be mentioned by the vendors |
| 8. | Maximum Write Speed | <ul style="list-style-type: none"> • 2-8 mm²/min @ 0.6 μm resolution. • 8-30 mm²/min @ 2.0 μm resolution. • 30-120 mm²/min @ 4.0 μm resolution. • 120- 450 mm²/min @ 8 μm resolution. A write time calculator should be included |
| III. Substrate Details & Holding: | | |
| 9. | Substrate Type & Sizes | Silicon, Germanium, GaN, SiC, Sapphire, etc. |
| | | Sizes varying from 0.4 inch x 0.4 inch to 6 inch x 6 inch. |
| | Substrate Holding | <ul style="list-style-type: none"> • Substrate should be held on an automated high precision XYZ linear drive stage and it should be capable of accepting thickness of up to 10 mm as well as very small and thin wafers of few mm. • Customizable vacuum chuck for holding the substrates of any shape and size. Suitable provision for keeping in positional wafers/pieces either through vacuum or friction. |
| IV. Laser Source & Exposure control | | |

| | | | | | | | |
|--|--|--------------------------------------|---|--|-------------------------|--|-------------------------|
| 10. | <ul style="list-style-type: none"> • Semiconductor diode laser with exposure wavelength of 405 nm or less with suitable power ranges. • Associated focusing lens and option of interchange ability between two laser sources should be provided. • Guaranteed lifetime of exposure source should be ≥ 15000 hours. • Source Power (operator selectable) should be clearly specified by the supplier. • Exposure control: Automatic and manual • Exposure control, with step (coarse) and continuous (fine) regulation, with indication of the dose used for the exposure (mJ/cm²). • Grey scale exposure mode for 3-dimensional patterning (with 256 levels per pixel) capable to use BMP, STL and other raw data. • Both positive and negative patterning. • Focus: Automatic and manual • Under automatic mode: It should automatically track the substrate surface, allowing patterning on concave or convex surfaces or surfaces with waviness. | | | | | | |
| V. Stage Assembly : | | | | | | | |
| 11. | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; padding: 5px;">X-Y Stage</td> <td style="padding: 5px;">Possibility of having the system "ready" for hosting the interferometer components in the future Any X-Y stage movement must be programmed with position synchronized beam on/off.</td> </tr> </table> | X-Y Stage | Possibility of having the system "ready" for hosting the interferometer components in the future Any X-Y stage movement must be programmed with position synchronized beam on/off. | | | | |
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| 12. | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; padding: 5px;">Stage travel range</td> <td style="padding: 5px;">X axis: 100 mm or more.</td> </tr> <tr> <td></td> <td style="padding: 5px;">Y axis: 100 mm or more.</td> </tr> <tr> <td></td> <td style="padding: 5px;">Z axis: 3 mm or more.</td> </tr> </table> | Stage travel range | X axis: 100 mm or more. | | Y axis: 100 mm or more. | | Z axis: 3 mm or more. |
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| | Y axis: 100 mm or more. | | | | | | |
| | Z axis: 3 mm or more. | | | | | | |
| 13. | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; padding: 5px;">Stage resolution / minimum stageStep</td> <td style="padding: 5px;">X axis: 50 nm or less.</td> </tr> <tr> <td></td> <td style="padding: 5px;">Y axis: 50 nm or less.</td> </tr> <tr> <td></td> <td style="padding: 5px;">Z axis: 100 nm or less.</td> </tr> </table> | Stage resolution / minimum stageStep | X axis: 50 nm or less. | | Y axis: 50 nm or less. | | Z axis: 100 nm or less. |
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| | Y axis: 50 nm or less. | | | | | | |
| | Z axis: 100 nm or less. | | | | | | |
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| VI. Photoresist details: | | | | | | | |
| 15. | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; padding: 5px;">Photo-resist details</td> <td style="padding: 5px;">The system should be capable of processing G, and I-band resists.</td> </tr> </table> | Photo-resist details | The system should be capable of processing G, and I-band resists. | | | | |
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| VII. Optical microscope/camera, profiler details and Substrate visual monitoring: | | | | | | | |
| 16. | System should have high quality Camera system for substrate inspection, automatic and manual alignment and measurement functions including dimension measurements should be provided. | | | | | | |
| 17. | High optical resolution up to 1 μm or better. | | | | | | |
| 18. | Optical Magnification camera / Microscope: | | | | | | |

| | | |
|---|---|---|
| | The lens change/magnification mechanics should allow fast selection of the lenses/magnification (5 x, 10 x, 20 x . . .) And its related field of view via software. Metrology tools should be provided. | |
| 19. | System must have a built in 2-dimensional optical profiler for examining deposited layers, exposed Resists and other processes. This is optional and not mandatory. | |
| 20. | System should be capable of grey scale exposure to fabricate 3-D structures in a single step. | |
| 21. | An in-built automatic wafer inspection tool will be preferred. | |
| VIII. Control hardware and software: | | |
| 22. | Acceptable data formats | CIF, GDSII, DXF and BMP |
| 23. | Control Hardware and Software /Driver | System should have control electronics and software / driver for controlling autofocus system, image processing hardware etc. The firm should provide detailed features and capabilities of data processing and control software. |
| 24. | Computer | Windows 10 based Computer for system control and data conversion should be supplied along with Wi-Fi wildcard. |
| 25. | Write time estimation & intimation | The system should have the capability to calculate automatically the estimated time required to expose the substrate before starting of the writing process. |
| 26. | System environment stability | Environment chamber (Class 1000) for controlled and stable environment during system operation may be provided with the system. Chamber illumination should be provided with Red Light. |
| 27. | Mask design software | Latest version of any standard mask design software or CleWin / Intelli CAD / K-layout / Layout editor with format converters to/from GDSII, DXF, and CIF etc. should be supplied and preloaded with the system. Grey level data handling suite, manual controller of the write unit, for using the system for surface inspection. |
| 28. | Possibility of full manual control of the system. | |
| IX. Other details: | | |
| 29. | Operator table | Vibration damped, Optical Bench has to be supplied |
| 30. | Operational power supply | The system should be designed to operate on 220 VAC \pm 10%, 50 Hz, 1 Phase or 380 VAC \pm 10%, 50 Hz, 3 Phase. |
| 31. | Equipment and operator safety | System should be supplied with all necessary safety interlocks and switches for operator safety. |

| | | |
|---|---|---|
| 32. | Service support | Vendors having their service support / office in India are mandatory. |
| 33. | Warranty | 5 years warranty (1 year standard and +4 year additional) for all the parts, hardware & overall performance. The complete supply must be guaranteed for free repair / replacement and free software upgrades (wherever applicable) during this period, from the date of installation, commissioning and acceptance of the equipment. Besides, the extended warranty should be quoted separately. |
| 34. | Consumables | The list of consumables, except photoresist and developer needed for 5 years of trouble-free operation should be provided and the same should be quoted separately. |
| 35. | Documentation | A complete set of original manuals (soft and hard copies) including User manuals, maintenance manuals, trouble shooting tips, built assembly drawings, foundation lay-outs and manuals of all imported/purchased components, together with manuals of the system must be provided in English Language. |
| X. Installation & Commissioning: | | |
| 36. | <ul style="list-style-type: none"> • The supplier or his representative will do the installation and commissioning of the lithography unit as per above description at BHU and demonstrate the operation. • Two Users should be trained for operation, maintenance and servicing of the unit at BHU. • The infrastructure/ utilities required from this laboratory should be intimated with the offer. | |
| XI. Terms and conditions: | | |
| 37. | <ul style="list-style-type: none"> • The instrument should be table top model. No special facility like cooling duct, air or water supply will be provided for the installation. Mains supply of 240 V +/-10V/50 Hz single phase and controlled environment will be provided to install the instrument. • It is mandatory that Indian Representatives should be available for servicing and support after installation and commission. • Vendor / Firm should have demonstrated capability with at least 5 years of experience in supplying at least 3 – 5 similar equipment (identical or very similar specifications) to various organizations / institutions / laboratories / universities in either India or Abroad and the details of contact Nos., email, place etc., should be submitted along with the technical offer. • Provide the details /contact Nos., e-mail etc. of the place where the mask aligners have been supplied and installed. | |

XII. Compliance requirements:

38. • A point to point compliance sheet of the technical specifications should be submitted along with the technical offer.
 • In case, if the firms not meeting the scope of supply and not providing compliance requirements and their offer will be considered as disqualified.

XIII. Optional Items / Accessories:

The optional accessories will not be considered for evaluation of lowest bidder. The optional items may be procured based on requirement from the techno-commercially qualified lowest bidder.

39. Laser source: Semiconductor diode laser with exposure wavelength of 375 nm
40. An optional laser interferometer stage with alignment accuracy of 0.5 Micron.
41. Front-back wafer alignment: The alignment tool should allow the operator to align a new pattern with another pattern already made on the back surface of a wafer. Alignment precision should be within 2 μm .
42. Any active or passive accessories needed along with the system.

2. Specifications of Wafer Probe Station for DC IV/CV, RF up to 67GHz and optical probing and accessories

The system shall consist of a manual probe station which must be able to interface (with all necessary adapters, cables, etc. with minimum loss) and configure (by utilizing all necessary application tools etc.) with all wafer level measurement sub-systems for semiconductor device characterization measurement of DC IV/CV, 2 port RF Measurement up to 67 GHz for wafer level integrated circuits. The probe station shall come with high resolution microscope, non-thermal chuck (to mount a wafer with diameter up to 150 mm).

| No. | Parameter | Specification |
|----------|---|---|
| 1 | General Specifications | |
| a | The Probe System must be able to support the following on-wafer measurement setup | a) 4 DC and CV (DC to 10MHz) parametric measurements with semiconductor parametric analyzer. |
| | | b) 2 port RF measurement from DC up to 67GHz measurement. |
| | | c) System must come with Prober Proprietary RF Calibration software |
| b | Probe System Integration | The system must be able to integrated with any instruments brands and types for all device measurement test setup |
| 2 | Mechanical Performance Specification of Probe System | |
| a | Chuck Stage Movement | Manual |
| b | Chuck X-Y Stage | Independent X & Y Axis control of the chuck stage |
| | X-Y stage travel range | ≥ 150 mm (Both X axis and Y axis) |
| | X-Y fine travel range | ≥ 25 mm (Both X axis and Y axis) |
| | X-Y travel resolution | < 5.0 μm or better |
| c | Chuck Z Stage | |
| | Z Stage travel range | Chuck Z can be of fix height with plate lift with discrete contact, separation or with stage Z movement of ≤ 10 mm for load stroke, separation and contact up to 3mm adjustment. |

| | | | |
|-----------------------------|---|---|---|
| | d | Chuck Theta Stage | |
| | | Theta Stage travel range | $\geq \pm 5.0^\circ$ degree fine adjustment or higher |
| | e | Platen | |
| | | Platen Lift System Control | The system should have platen height adjustment and platen lift with discrete Contact, Separate (200/300um) and Loading (3mm) position for ease of use and safety lock function at load position with +/- 1um repeatability for consistent contact quality. |
| | | Platen Lift Range | ≥ 20 mm or higher |
| | | Platen Lift Contact Repeatability | $\leq 1 \mu\text{m}$ |
| | | Platen maximum number of positioners | ≥ 8 set or higher for RF and DC |
| | | Separation Lift | $\leq 300\mu\text{m}$ |
| | f | Loading and Unloading of Wafer | The systems should support front loading and unloading of wafer with clear view of the wafer or substrate. |
| | g | System control access and marking | The system should have easy access and clearly marked vacuum control, integrated service loop for stable X-Y Stage Movement. All Safety Hazards must be clearly label and indicated. |
| 3 Wafer Chuck System | | | |
| | a | RF Wafer Chuck | Thermal |
| | | Temperature | 35°C to 150°C with Air Cool Technology |
| | | Maximum Wafer Size Support | 150 mm |
| | | Chuck Diameter | ≥ 150 mm |
| | | Temperature control Method: | Temperature control Method: Cooling air / Resistance heater |
| | | Chuck Electrical Connection: | Chuck Electrical Connection: Coaxial BNC |
| | | Chuck Temperature Resolution: | $\leq 0.1^\circ\text{C}$ |
| | | Temperature Accuracy and Stability: | $\leq 1^\circ\text{C}$ |
| | | Chuck Surface Flatness | $\leq \pm 15 \mu\text{m}$ |
| | | Heating Rate from 35°C to 150°C : | ≤ 20 min |
| | | Cooling Rate From 150°C to 35°C : | ≤ 20 min |
| 4 Microscope System | | | |
| | a | Microscope System Mount | Microscope bridge mount design specifically designed for stable microscope movement. |
| | | Microscope Stage Movement | Manual X and Y Axis with Microscope tilt back |
| | | Microscope X-Y Stage | Independent linear X and Y Axis control of the microscope stage |
| | | X-Y stage travel range | ≥ 25 mm (Both in X and Y axis) |
| | | Microscope Z Lift | Manual, tilt back for easy probe reconfiguration |
| | | Microscope focus block movement range for fine and coarse | >30 mm |

| | | | |
|----------|---------------------------------------|--|--|
| | | adjustment | |
| | b | Microscope Parameters | |
| | | Eye piece, working distance and magnifications | a) Variable zoom microscope with standard 25x eye piece b) Working Distance ≥ 100 mm c) Magnification: Optical Magnification $\rightarrow 16x - 110x$ |
| | | Optical Resolution | For Stereo-zoom microscope zoom should be 6.0 x or better. Should be able to probe 50 μm pads clearly. |
| | | Illumination | LED light source with external intensity control unit, either ring or single LED light |
| | | TV Port (C-Mount) | 1 X |
| | c | Digital Camera for image capturing and live view - | |
| | | Camera Resolution | ≥ 2 MP |
| | | Video Capture Resolution | 1080p High Definition Standard |
| | | Video Output | HDMI |
| | | Software | Camera to come with image capturing software and distance measurement capabilities integrated in the camera, able to store in SD card and uses mouse to navigate through the monitor |
| | d | Monitor to view and connect with Digital camera for live view | |
| | | Monitor Size | Minimum 21 inches |
| | | Monitor Type | LED or LCD only |
| | | Resolution | $\geq 1920 \times 1080$ pixel |
| | | Input | HDMI and DVI/VGA input |
| 5 | DC Positioners and Accessories | | |
| | a | Micro Positioner for DC measurement | 4 Sets of Micro-positioners for DC/CV Measurement |
| | | Micro Positioner XYZ Travel range: | ≥ 10 mm in X axis ≥ 10 mm in Y axis ≥ 10 mm in Z axis |
| | | Micro Positioner Feature Resolution | $\leq 5.0 \mu\text{m}$ |
| | | Micro Positioner Screw Resolution | $\leq 500 \mu\text{m}$ in X,Y,Z axis / per turn |
| | | Micro Positioner Mounting | Magnetic mount on platen with on and off switch |
| | b | Triaxial Probe Arm | 4 Set of Triaxial Probe Arm with 2 meters cable (Includes 4 unit of BNC to Triaxial Adapters, 4 unit of BNC to Banana Adapters) |
| | c | DC Probe Needles | For IV and CV Measurement |
| | | Material | Tungsten |
| | | Tip Radius | 7 μm |
| | | Quantity | 25 probe per tip radius |
| | d | Cables for measurement setup | The system should be equipped with all Triaxial cables connection for all DC and CV Setup. |
| 6 | RF Positioners and Accessories | | |
| | a | Micro-Positioner for RF measurement | 2 Sets of RF Micro-positioner for East West configuration for up to 67GHz RF Probe |
| | | Micro Positioner XYZ | ≥ 12 mm |

| | | | |
|----------|---|-------------------------------------|---|
| | | Travel range: | |
| | | Micro Positioner Feature Resolution | $\leq 3.0 \mu\text{m}$ |
| | | Micro Positioner Screw Resolution | $\leq 500 \mu\text{m} / \text{per turn}$ |
| | | Micro Positioner Mounting | Magnetic or Vacuum mount on platen |
| | | RF Positioner frequency support | DC up to 67 GHz |
| | b | RF Probe Arm | a) Universal RF and microwave probe mount. b) Accurate RF probe planarity control by micrometer screw adjustment c) RF Cable guide compatible with micro-positioners |
| | | | |
| 7 | 67GHz Application RF Probes Accessories and Calibration Software | | |
| | a | 67GHz RF Probe Specification | 2 sets of 67 GHz RF probes and cables set |
| | | RF Probe Frequency Range | DC – 67 GHz |
| | | RF Probe Tip Configuration | 1 unit of GS and 1 unit of SG Probe with following features |
| | | | Maximum insertion loss < 1.1 dB or lower |
| | | | Maximum Return loss > 16 dB |
| | | | Maximum DC current: $\geq 1 \text{ A}$ or higher |
| | | | Maximum DC voltage $\geq 100\text{V}$ or higher |
| | | | Operating Temperature: -50°C to 150°C or better |
| | | | Maximum RF Power: $\geq 5 \text{ W}$ or higher @ 10 GHz |
| | | | Contact Resistance on Au: < $5\text{m}\Omega$ |
| | | RF Probe Pitch | Probe Pitch to be advise upon ordering, probe pitch ranges from 100um up to 250um |
| | b | 67 GHz RF Cable | 2 unit of Low Noise DC to 67GHz RF cable for RF probe to VNA connection. |
| | | RF Cable Connector Type | V(1.85mm) male to V(1.85mm) female |
| | | Return loss, dB | $\geq 18 \text{ dB}$ |
| | | Insertion loss, dB | $\leq 9 \text{ dB}$ |
| | | Cable Length | 1.2 meters |
| | c | Calibration Substrate | On-Wafer RF Calibration Substrate or Impedance Standard Substrate. |
| | | Calibration Probe Pitch Range | 100um - 250um probe tip pitch range of probes |
| | | Frequency Range | DC- 110 GHz or better |
| | | Calibration Standards | Short, Open 50 Ω Load, Through for GS and SG Probe |
| | d | RF Calibration Software | a) Standalone GUI based calibration software matched with probe stations and commercial VNAs b) Proprietary Calibration Software to work with the probe station c) Compatible with live data measurement d) Automatic calibration feature. e) Feature to measure S-parameter measurement. f) Calibration Method must support minimum SOLT, Multiline TRL and LRM Calibration |
| | | | |

| | | | |
|-----------|--|--|---|
| 8 | Vibration Isolation Platform | | |
| | a | Vibration Isolation platform | Anti-vibration platform to minimize contact pad damage |
| | b | Vibration Isolation Methodology | Adjustable air damping system, Automatic Load Balancing |
| | c | Internal Frequency | ≤ 3.5 Hz |
| | d | Maximum load Capacity | ≥ 200 kg |
| 9 | Vacuum Pump & Air Compressor and tools | | a) Should be compatible with probe station. b) Low noise and compatible with probe station. c) Wafer Tweezers and tool box included d) All electrical cables included |
| 10 | Power Rating for all Equipment | | 230 V, 50 Hz, Single Phase |
| 11 | Certifications | | CE |
| 12 | DarkBox and Prober Table | | (a) Stable Metal Frame table for probe station with anti-vibration platform Prober table comes Integrated rack for thermal controller, booster, computer, (b) Suitable monitor stand mounted to table for HD LED 21inch Monitor for Microscope viewing of device under test. (c) Dark box for EMI and Light Tight setup includes EMI shielded interface panel for RF, DC and CV measurement as well as another connector for the system to work properly. |
| 13 | Others | | |
| | a | The General Warranty Conditions are that the company should provide On Site Warranty for 1 year + 4 years extended warranty from the date of installation and commissioning of the equipment. Any problem during the warranty period should be attended on priority basis. | |
| | b | Proper training and characterization demonstration at BHU Campus has to be done. | |
| | c | The supplier shall furnish along with the system two sets of the following documentation (in English), in well bound sets/volumes of good print quality or in pen-drive/ optical drive or in both: | |
| | d | Instruction Manual | |
| | | a. The manual shall, through the medium of sectionalized technical documentation (printed text, tables, graphics), relate and describe in detail the System's mechanical, electrical, structural, operational and maintenance features and functions and their theoretical analysis from the most basic to the total system level & trouble shootings. b. All standard manuals, technical data sheets and other pertinent information offered by the manufacturer of functional electrical and mechanical modules used in the System shall be included in the manuals. c. Vendor / Firm should have demonstrated capability with at least 5 years of experience in supplying at least 3 similar equipment (identical or very similar specifications) to various organizations / institutions / laboratories / universities in either India or Abroad and the details of contact Nos., email, place etc., should be submitted along with the technical offer. | |
| | | | |

3. Specifications for Semiconductor Parametric Analyzer and accessories

A. Current versus voltage (I-V) measurement

- Accurate and precise measurement ranges of 0.1 fA - 1 A and 0.5 μ V - 200 V
- Spot and sweep measurement
- Time sampling measurements (100 μ s minimum sampling rate)
- Pulsed measurement with minimum pulse widths of 50 μ s using the MCSMU or 500 μ s using the HPSMU, MPSMU, or HRSMU
- The ASU (atto-sense and switch unit) can be used with the MPSMU, or HRSMU to provide 0.1 fA measurement resolution and SMU/AUX path switching
- Two analog-to-digital converter choices (high-resolution ADC or high-speed ADC) available for each SMU type (HPSMU, MPSMU and HRSMU)

B. Capacitance measurement

- Multi-frequency AC impedance measurement supports CV (capacitance versus voltage), C-t (capacitance versus time) and C-f (capacitance versus frequency) measurement
- Capacitance measurement frequency range of 1 kHz to 5 MHz
- Quasi-Static Capacitance-Voltage (QS-CV) measurement with leakage current compensation
- Automated switching between IV and CV measurements using either the optional SCUU (SMU CMU unify unit) and GSWU (guard switch unit) or a pair of ASUs

C. Pulsed I-V/Fast I-V/Transient I-V measurement:

- Provides high speed and high sensitivity measurement capability for ultra-fast IV (current-voltage), pulsed IV and transient IV measurements, including NBTI/PBTI and RTN (Random Telegraph Signal Noise) measurements
- Arbitrary waveform generation with 10 ns programmable resolution
- Simultaneous high-speed voltage/current measurement (200 MSa/s, 5 ns sampling rate)
- SMU technology supports pulsed IV measurement without load line effects

4. Specifications for Inkjet printer and accessories

| No. | Specifications | |
|-----|--|---|
| | System configuration | System should be compact and can be placed on a desktop. The printer should allow single micron scale patterns drawn directly under normal temperature and normal atmosphere. |
| | Nozzles | Nozzles should be disposable, low cost and easily exchangeable. |
| | Application | System should be suitable for printable electronics ,solar cells, touch panels,LEDs, resist coating, bump Forming, Micro lenses, bio-technology, Microarrays. |
| | Usable Fluids | Conductive Inks ,Insulating Inks ,Resist Inks ,UV Inks,Solvent Inks,Protein materials, etc. |
| 1 | Print head / Nozzle | |
| 1.1 | Number of Nozzles | One or more |
| 1.2 | Print head maintenance | Disposable, No cleaning, Easily exchange |
| 1.3 | Minimum required ink filling amount for printing | Less than 20 μ l |

| | | |
|-----|--|--|
| 1.4 | Cartridge material compatibility | Water, solvent, acid/base, alcohol-based inks |
| 1.5 | Nozzle inner diameter | Less than $\phi 5\mu\text{m}$ |
| 2 | Work stage | |
| 2.1 | Printable area | 50mm x 50mm or more |
| 2.2 | Work stage resolution | Less than or equal to $0.1\mu\text{m}$ |
| 2.3 | Repeatability of Work stage positioning | Less than or equal to $\pm 0.2\mu\text{m}$ |
| 3 | Printing | |
| 3.1 | Print inks | Metal nanoparticle inks (Ag, Cu, Au etc.), dielectric ink, and custom-made inks etc. |
| 3.2 | Printable line width | Less than $5\mu\text{m}$ |
| 3.3 | Bump fabrication | More than $20\mu\text{m}$ height bumps |
| 3.4 | Wide range of ink viscosity | 0.5 -10,000 [milli Pa sec] |
| 4 | Camera system | |
| 4.1 | Real time observation for printing | Can be observed print situation by a monitor |
| 4.2 | Alignment camera | System should include Alignment camera |
| 5 | Computer | |
| 5.1 | Operative system | Windows 10 based system |
| 5.2 | Monitor | 2 monitors (for observation camera and for operation) |
| 6 | Software | |
| 6.1 | Input file format | Vector format |
| 6.2 | pattern Design | Arbitrary shapes (Dot,lines,circle,polygonal shape |
| 6.3 | Applied voltage | DC voltage and AC voltage |
| 6.4 | Applied waveform | Should have possibility to make waveform by user. |
| 6.5 | Applied frequency | More than or equal to 1kHz |
| 6.6 | Substrate angle correction | It Should be through software |
| 7 | Installation and Training | |
| 7.1 | The system shall be installed and commissioned at the customer's site by company trained engineer. The quotation shall be inclusive of all charges, if any, for installation and commissioning of the equipment by the vendor. | |
| 8 | Electricity supply | |

| | | |
|-----|--|--|
| 8.1 | System should be compatible with: Single phase: 230 V, 50 Hz Or Three phase: 420 V, 50 Hz | |
| 9 | Manual and Tool Support | |
| 10 | All operating and maintenance manuals, etc., need to be provided. | |
| 11 | One hard copy of operational and trouble-shooting manual to be provided. | |
| 12 | One set of maintenance specific tool kit to be supplied along with the equipment. | |
| 13 | Warranty | |
| 14 | Minimum 1 year + 4 years extended warranty after successful installation and acceptance of the system by the customer. During this warranty period, any update in the software shall be provided free of cost. | |
| 15 | Remarks | |
| 16 | Sales result in the world | The system should be used over 10 countries. |

5. Specifications for Four Point Probe sheet resistance /resistivity measurement system and accessories

System should be capable of measuring resistance (Ω), Resistivity (Ω cm), sheet resistance (Ω /sq) of silicon wafers, and diffused layers, metal layers V/I for up to sample.

- Microprocessor based electronic system with digital display.
- Range of Resolution :-
 - Resistivity : $1.0\mu \sim 300.0$ K ohm.cm
 - Bulk : 0.5 m ohm ~ 1.0M ohm.cm
 - Sheet resistance : 5.0m ~ 10.0M ohm/sq
 - V/I Ratio : 1.0m ~ 3.0M ohm
- Measurement Accuracy : % Bias $<\pm 1\%$
- Measurement Repeatability : $cv \leq 0.7\%$
- Operating Temperature: Room Temperature (23 °C).
- Spacing between probes : 1 or 0.5mm
- Sample size : min 4mm-76.2mm and max 200mm

- Sample thickness : 10mm or more
- System should be compatible for : Silicon , solar cells , Polysilicon , SiC , Carbon Nanotube , DLC, Graphene , conductive thin films , diffused samples .
- System should calculate Resistivity and conductivity for samples with known thickness.
- Input Power Specification: AC 100 to 240 V \pm 10%, 50 Hz.
 - System Feature:-Cartridge type 4- Point Probe Head, tester + Manual (lever) probe up – down stroke stage.
 - Tester self-test function/Auto changer-over measurement range function.
 - Thickness & Temperature Correction function for Silicon Sample.
 - Thickness input with easy JOG dial operation.
 - Average measurement and digital direct readout.
 - Temperature Correction for Silicon resistivity Measurement
 - Automatic Zero adjustment & Range Selection.
 - USB Interface.
- Warranty – 1 year standard warranty + 4 years extended warranty should be included in price.
- Installation – System should be installed in BHU Campus.

6. Specifications for Thermal Evaporation System and accessories

- Electro-Polished Stainless Steel Chamber (D-shaped box)
- 4” Diameter View Port on Front Door with Manual Shutter
- Turbo Molecular Vacuum Pumping System with Matching Dual Stage Rotary Vane Pump
- Quartz Crystal Thickness Sensor with Deposition Controller
- Full Range Vacuum Gauge with Digital Display and Readout
- Up to Four Resistive Thermal Sources with Individual Shutters
- PLC Controlled System
- PC Controlled System
- Consumable & Spare Parts

7. Specifications for RF Sputtering System and accessories

- Electro Polished Stainless Steel Chamber (D shaped Box)
- 4” Diameter View Port on Front Door with Manual Shutter
- Single/Multiple Magnetron Gun Assemblies with Various Target Sizes
- Manual Shutter Assembly for All Sources
- DC / RF Sputtering Deposition
- Turbo Molecular Vacuum Pumping System with Matching Dual Stage Rotary Vane Pump
- Quartz Crystal Thickness Sensor with Deposition Controller
- Mass Flow Controller with Digital Readout
- Full Range Vacuum Gauge with Display & Readout
- Easy Target Mounting
- Semi-Automatic Controlled System
- Consumable & Spare Parts

8. Specifications for Plasma Cleaning System and accessories

The plasma cleaning system should have following specifications:

Scope: The system should be CE certified & can be used in removal of organic contaminants on work surfaces and enhancing hydrophilic / hydrophobic properties and inter-layer adhesiveness etching in Microfluidics, tissue engineering, Graphene & 2D Materials and other Nano-science and micro-electronics applications. The system should work with single phase 220V, 50Hz electrical power

supply.

Mounting: Dual Mode (RIE and Plasma Etching using single System) Table Top damage-free plasma process system.

Process Chamber: Rectangular chamber having view port with below specifications:

Plasma Mode: Dual Mode Selective (Reactive Ion Etching or Plasma Etching)

- a. **Chamber size:** 140mm x 200mm x 110mm (W x D x H)
- b. **View port**
- c. Chamber finishing by precision lapping & ultrasonic cleaned.
- d. Dovetail grooves for all seals.
- e. Vent Screws for inner chamber.
- f. Gas shower head integrated door for uniform gas flow.
- g. Combination of perforated plate and buffer chamber for uniform gas flow in the chamber
- h. Zone separation should be there (Plasma Zone & Buffer Zone)
- i. Diameter of the Viewport should be 45 mm or more, and should be Glass Window.

Dual Mode :

- (a) System should have possibility to select either RIE Mode or PE mode
- (b) Upper electrode should be of aluminium with ceramic Insulation for spacer, Ignition Plug and electrode assembly
- (c) Lower Electrode should be of Hard Anodized Aluminium with 100 mm Dia ,with Ceramic Insulation Block ,Ignition Plug
- (d) There Should be 2 vacuum switch for mode selecting .
- (e) Heat sink for high speed switcher on board module should be there .
- (f) In manual operation user should have possibility to define the powered electrode either upper electrode (PE) Mode or Lower electrode (RIE) mode.

Generator: DSP on board feedback control as automatic impedance matching up to 200W with free adjustment power having frequency from 20~100 kHz with 10 kHz increment.

Gas Line Package: System should be integrated with below gas line package:

- a. **Gas Channel:** 2 x gas line (Oxygen, Argon)
- b. **Additional gas line:** 1x empty gas line for future up-grade.
- c. Gas flow-control by MFC is desirable having flow rate up to 100scc
- d. Stainless steel gas line with 1/4" Swagelok fittings as standard
- e. Response speed should be less than 1 sec.
- f. Accuracy should be $\pm 1\%$ of full scale and operating temperature from 5 to 50°C.
- g. Linearity : $\pm 0.5\%$ Full scale
- h. All gas pipe line, purge, and vent are made up of stainless steel.

Vacuum Pump and gauges: pump should be Scroll oil rotary pump having pumping speed 80 l/min @ 50Hz with ultimate pressure 1×10^{-3} Torr.

Vacuum gauge: Pressure transmitters (Atm~ 5×10^{-5} Torr)

Process controller:

- a. DSP on board signal controller with 16x input & 16x output port.
- b. 10 x A/D & 10 x D/A with 16 bit resolution
- c. RS232 Communications.
- d. All parameter like set value of power, power output, frequency, pressure, plasma-on time, gas flow set and flow for MFC should be display on the screen.

Operational Software:

- a. Win CE based OS with color touch PC interface for full process control.
- b. Recipe control like creation, load etc.

- c. Up to 10x process recipes can be stored with up to 10x process steps in each recipe.
- d. Control of all process parameters.
- e. Support graph viewer
- f. Real-time display for status and error monitoring.
- g. Data downloading facility by USB.

Warranty: 2 year standard warranty + 3 years extended warranty after installation and commissioning at BHU Campus.

9. Specifications for Solar Simulator Workstation and accessories

1. SOLAR SIMULATOR- EQX IPCE Measurement System

2. Application

- External Quantum Efficiency (EQE), Internal Quantum Efficiency (IQE)
- Photoluminescence (PL), Electroluminescence (EL)

3. Standard Configuration

- Sample Information
 - Sample Size: 2x2 inch (50x50mm)
 - Sample Type: Solar Cell, Light Emitting Diode/ Photodetector /Light Emitting Transistor/ Phototransistor /Light Emitting Phototransistor
- EQE Measurement
 - Sample Mounting Unit (Jig)
 - Light Source & Lamp Power Supply
 - Motorized Filter Wheel and Sorting Filter
 - Monochromator (200-1500nm)
 - Optics: Focusing, Collimating Lens, Optics Holder, Aperture
 - Dark Room Case: 1200(W)x800(D)x1000(H)mm
 - Optical Table
 - Lock-In Amplifier 4 Ch. & Optical Chopper 3.4Hz~1000Hz(A/C Mode)
 - K102 Signal Amplifier (10V, 1A) Bias
 - Reference Cell
 - Solar Cell IPCE Test Software
 - Data Processing Unit (PC)
- (Option) Internal Quantum Efficiency (IQE) Upgrade
- (Option) Spectrum Extension

4. System Component Specification

4-1 Light Source & Lamp Power Supply

- Lamp Housing (F/1UV Grade fused silica)
- Universal Power Supply
- 300W Xe Arc Lamp
- Socket Adaptor
- Light Source Cable
- Using Beam Path Assay

4-2 Motorized Filter Wheel & Sorting Filter

- Remote filter selection via computer (RS-232)
- Hold 6 filters simultaneously
- Easy and quick filter insertion and removal

- Filter size circular or square: 1 in (25.4mm)
- Thickness: from 2.5mm to 10.2mm
- LP filter 1in dia 305nm cut-on
- LP filter 1in dia 570nm cut-on

4-3 Monochromator

- Wavelength: 200nm~1,500nm
- Focal Length: 130mm
- F Number: 1/8m
- Grating 1: 300-480nm
- Grating 2: 500-1200nm
- Micrometer Driven Slit Assembly

4-4 Optics

- Focusing & Collimating Lens, Optics Holder, Aperture

4-5 Lock-In Amplifier & Optical Chopper

- 1mH to 102KHz Frequency Range
- Harmonic Detection (2F,3F,...nF)
- 4Hz to 1000Hz Chopping Frequency

4-6 K102 Signal Amplifier

- DC power control with Signal Amplifier
- Voltage range: $\pm 10V$
- Voltage Setting Range: Min. $\pm 5mV$
- Stability: $< 0.1\%/h$ after 30 min. warming up
- PC Interface: Serial
- Dimension: 500mm (W)x 400mm (D)x 110mm (H)
- Weight: $< 10Kg$
- Line Voltage: 220V50/60Hz

4-7 Reference Cell

- Calibrated Photodiode
- Calibrated Si-PD: 300 ~ 1,100nm
- UV-Vis Range: Mono-Si Reference Cell
- NIR Range: InGaAs Reference Cell

4-8 Sample Mounting Unit (Jig)

- Standard Sample Size: 20mm x 20mm
- Top & Bottom Type
- Pogo Pin Contact
- Printed Circuit Board for Electric Signal Connection
- Polyacetal Material

4-9 Dark Room Case

- Dark Room Size: 1200 (W) x 800 (D) x 1000 (H)mm
- Weight: $< 20kg$

5. Software (For IPCE Measurement)

- Solar Cell Spectral IPCE Measurement Software
- MS Windows 7 OS or Higher Version OS
- Real time monitoring of time/ bias voltage/current density/efficiency
- Graphic display of measurement data
- Data file in text spread sheet or MS Excel format
- NREL Standard Format Applied

6. Data Processing Unit(PC)

- 2 Set of Standard Desktop
 - 1 Set for PR670 Measurement (Or, Solar Simulator)
 - 1 Set for EQE Measurement
- Windows 7OS English Ver.
- 1TMemory Diskor Higher Version OS

7. Internal Quantum Efficiency (IQE) Upgrade

- Integrating Sphere
 - 3.3” Integrating Sphere and Optics
 - Monitoring Photo-Diode (Si-PD)
 - Signal Amplifier for Reflectance
 - Lock-in Amplifier 1 Ch. Add
 - IQE Software Upgrade

8.Spectrum Extension

- 1/8 meter Monochrometer
- Reference Ge Photodiode
- 1200/400 Grating (Spectral Range: 300-900nm)
- 900/1300 Grating (Spectral Range: 900-2200nm)

10. Specifications for Electrochemical Work station and accessories

- **No of Channels: 4** (Upgradable for at least 10 channels)
- **Maximum scan rate:** 1000 V/s with 15 mV steps
- **Input bias current of electrometer:** < 1 pA
- **Compliance voltage:** ± 20 V or better at complete ± 400 mA current range – Adjustable compliance voltage configurations will not be considered. Compliance voltage add-ons or modules have to be quoted separately.
- **Maximum Output Current:** ± 400 mA or better at ± 20 V (Expandable upto ± 10 A)
- **Output Voltage Range:** ± 10 V or better
- **Measured current resolution:** 0.0003% at entire current range (30 fA default at 10 nA range). Must be a default hardware configuration without any additional amplification
- **Measured Potential Resolution:** 3 μ V or better
- **Potentiostat Rise/fall Time:** < 300 ns or lower
- **Interface:** USB interface for connection with PC
- **Input impedance of electrometer:** > 100 GOhm // 8 Pf
- **Independent EIS Configuration:** 1 no.
 - Applied Frequency Resolution: 0.005%
 - At 1 Hz frequency, impedance of 0.01 Ω must be determined with 0.3° Phase accuracy & at least 0.3 % measured impedance accuracy. i.e – Measured impedance = 0.01 \pm 0.00003 Ω .
 - Frequency Range with PSTAT/GSTAT: 10 μ Hz to 1 MHz at a maximum current of ± 400 mA
 - A Built-in EIS Simulation Software Required – Real time fit-simulation, live lissajous plots, live 3D plotting, real-time view of 10+ plots is required.

Electrochemical Cell Set-up 50 milliliter volume of aqueous electrolyte: Qt. 4

- PEEK or related cell wall material

- Gas-in – out apparatus
- Glassy carbon disc 2mm Working Electrode
- Metal Wire Auxiliary Electrode - Platinum (99.9%)
- Silver / silver chloride Reference Electrode

11. Specifications for Fuel Cell Station and accessories

PEMFC Setup Assembled in a table top Panel with Data Acquisition software

Should Include Gas flow controllers , cell hardware, Humidifier , Manual Back pressure regulator, Temperature control, Temperature/pressure monitoring & software for data collection.

Cell hardware 25 cm²– 1 no.MEA for installation- 2Nos.

Humidifier 1L capacity with Automatic fill– 2Nos. Manual Back pressure regulator – 2 Nos.

Water collect chamber -2 Nos. Pressure Monitoring – 2 Nos. Temperature control – 5 Nos.

Basic data collection software for temperature, Mass flow, pressure data collection – 1 No.

A. Gas flow controllers:

Mass flow controller for H2 200scm

Fitted with inlet solenoid valve

Repeatability $\pm 0.2\%$ Full Scale

Zero Shift and Span Shift 0.02% Full Scale / °C / Atm Operating Range / Turndown Ratio 0.5% to 100% Full Scale / 200:1 Turndown

Maximum Controllable Flow Rate 100% Full Scale Maximum Measurable Flow Rate up to 128% Full Scale (Gas Dependent)

Typical Response Time 100 ms (Adjustable) Warm-up Time < 1 Second

Analog Signal in/ output 0-5 Vdc Supply Voltage 230V AC

Mass flow controller for H2 500scm

Fitted with inlet solenoid valve

Repeatability $\pm 0.2\%$ Full Scale

Zero Shift and Span Shift 0.02% Full Scale / °C / Atm Operating Range / Turndown Ratio 0.5% to 100% Full Scale / 200:1 Turndown

Maximum Controllable Flow Rate 100% Full Scale Maximum Measurable Flow Rate up to 128% Full Scale (Gas Dependent)

Typical Response Time 100 ms (Adjustable) Warm-up Time < 1 Second

Analog Signal in/output 0-5 Vdc Supply Voltage 230V AC

B. cell hardware

Fuel cell Hardware Machined graphite separator plates Gold plated current collectors

Banana plugs for monitoring voltage Belleville washer

Built-in silicon rubber heaters (120 watt) for maintaining cell temperature

Nylon fitting/SS nut for gas tight connection to 1/4" tubing

Serpentine flow pattern Gaskets: Silicone (standard)

Size At (H x W x L): 11cm x 9.5cm x 4.5cm Weight (pounds): 3

FuelCompatibility: O₂, H₂, air,

Normal Operating Temp: 65 to 75 °C Maximum Temp: 180°C

Suitable SS Bolt Nutset

MEA for PEMFC

5-Layer Membrane Electrode Assembly (MEA) with integrated Gas Diffusion Layers (GDL)

MEA Type: Hydrogen Air Fuel Cell Membrane Type: Nafion™ PFSA NR-212 Membrane

Thickness: 50.8 micrometers (2 mil) Anode Loading: 0.5 mg/cm²

Anode Catalyst: 60wt% Pt on Vulcan (Carbon) Cathode Loading: 0.5 mg/cm²

Cathode Catalyst: 60wt% Pt on Vulcan (Carbon) Gas Diffusion Layer: Carbon Cloth with MPL -

W1S1005

Gas Diffusion Layer Type: Woven Carbon Fiber Cloth

Gas Diffusion Layer Thickness: 0.410mm (410 microns)

B. Humidifier

1 liter reservoir.

Bubbles. Inlet tube is immersed to the bottom. Outlet tube is kept at top of the chamber. Water fill port, water level tube. PID Temperature controller. Temp range RT~85 deg C

D. Others

Manual Back pressure regulator for Anode & cathode gas outlets –each one

Water collect chamber for Anode & cathode gas outlets –each one

Pressure Monitoring for Anode & cathode gas outlets –each one

Temperature control (cell, anode gas inlet , cathode gas inlet , anode gas humidifier & cathode gas humidifier)– each one

E. Software

Basic software for Data collection to store Gas flow 1 & 2 Temperature 5 Nos. , Back pressure 2 Nos., cell voltage.

System Software: The system software must have capability for hybrid measurements such as Spectro-electrochemistry, E-SPR, SECM, IMPS-IMVS, EQCM, etc. It should have TTL triggering, ADC, DAC based communication ports. The Software must be able to be downloaded to unlimited computers, free updates & fully windows based. Software should be capable of supporting a wide variety of electrochemical techniques as mentioned below:

- **Solar Cell / Fuel Cell Studies:** Linear polarization, Fully automated I-V plotting with automatic determination for max power point & fill factor, IMPS-IMVS evaluation, EQE / IPCE Analysis, Charge extraction, Photo-current response, Mott-Schottky plots for single frequency scan, automated band-gap analysis, etc.
- **Corrosion:** Linear polarization with Tafel Slope Analysis, Polarization resistance evaluation, Electrochemical Noise analysis, critical pitting technique, electrochemical frequency modulation, hydrogen permeation analysis etc.
- **Battery & Supercapacitor Analysis:** Rectangular CV analysis at varying scan rates for pseudo capacitor analysis, complete charge and discharge with built in integration and 'linkable' cut-offs, Galvanostatic charge discharge with cycle number vs specific capacitance plot, Voltage measurement on counter electrode, GITT, PITT, etc.
- **Electro-catalysis:** ORR analysis using RDE/RRDE at varying rotation speeds and built-in Koutecky-levich plot generation, **HER and OER Tafel based analysis for water splitting**, Carbon dioxide reduction analysis, **default plug-n-play protocol for spectro-electrochemistry based LSV**, CV and Chrono evaluation, Galvanostatic CV and Chrono, ASV, DPSV, etc.
- **Trace Metal Analysis / Polarography:** DPSV, ASV, ChronoCoulometry, etc.
- **Sensors:** Automated one-click protocol for CV and LSV analysis at varying scan rates, fully automated single click amperometric detection protocol, EIS measurement with real-time equivalent circuit fit option, etc.
- **3D Based Live Plotting:** Powerful graphic engine with useful features such as vector graphics, individual axis scaling, overlays, multiple Y-axes, plot addition, real-time 3D with zooming and rotation. Minimum 10+ plot could be plotted simultaneously.

CPU Intel Core i7, RAM 8 GB RAM, HDD 1TB, GPU DirectX 9.0c compliant display adapter with 1GB RAM, TFT Monitor 20 inch, 101 Keys Keyboard, Optical Mouse, 3 USB Ports. Branded EPSON color Printer with Scanner & Photocopier.

12. Specifications for Spin Coater and accessories

The Spin coater system should have following specifications:

Scope:The system should be CE certified& can be used for coating very thin as well as thick resists over different substrates.

PROGRAMMABILITY

- Touch screen interface and display
- Full-color alphanumeric-capable graphical user interface (GUI)
- A virtually unlimited number of user-defined recipe program steps
- 0.1-second resolution for step times (9,999.9 seconds maximum step time)
- Spin speed: 0 to 12000 rpm
- Spin speed acceleration: 0 to 30,000 rpm/s unloaded

PRECISION

- Spin speed repeatability: < 0.2 rpm
- Spin speed resolution: < 0.2 rpm
- Substrate sizes: 8 inch Diameter.

RELIABILITY

- Vacuum and lid interlock
- Free remote technical support (phone, email, fax) for the life of the product should be there.
- Application process assistance for life of the product should be there

BOWL DESIGN

- High-density polyethylene (HDPE) spin bowl for material compatibility
- Versatile lid design should be there to allows process flexibility and repeatability
- Optional nitrogen purge for an inert spin environment should be there
- Integrated drain and exhaust ports should be there.

General Specification:

- (a) PC-controlled (manual, semi-auto, auto) with enhanced interface capability and connectivity should be there
- (b) Clear Acrylic transparent top cover plate, for full viewing of process during spinning.
- (c) Full color 7 inch touch screen Display.
- (d) Exhaust and drain port should be located below the wafer level (for better uniformity control by exhaust adjustment)
- (e) Security Password Protection should be there.

Real-Time Process Information:

- Constant feedback of process information for monitoring critical process parameters
- Streamlines interface between different tool types
- Visual clues on process status and health

Advanced Recipe Creation:

- Seamless switching between basic and advanced recipe creation methods
- Plain English recipe translation
- Pre-defined process commands
- Unlimited process steps
- Unlimited recipe storage

Environmental Monitoring:

- Monitoring of temperature and humidity
- Set preconditions and tolerances for monitored parameters
- On-screen colored visual clues for deviation from controlled specs

Data Logging and Export:

- Export data logs into commonly readable formats for further analysis and process troubleshooting
- Increase process efficiency
- Identify process control deviations
- Analyze multiple processes

➤ **Warranty –**

1 year standard warranty and 4 years extended warranty should be included with the System.

➤ **Installation –**

Proper installation should be done in BHU Campus.

13. Specifications for Glove Box and accessories

| S.No | Specification | Description |
|------|---------------------------|---|
| 1 | Glove box | <ul style="list-style-type: none"> • Internal dimensions (mm): 1200 (W) x 900 (H) x 750 (D) (\pm 5%) • Material of construction: Stainless steel • Thickness (mm): 3-4 • Environment: Nitrogen, Argon & Helium • Performance: H₂O < 1ppm, O₂ < 1 ppm |
| 2 | Box operating pressure | <ul style="list-style-type: none"> • Between +15 mbar to -15 mbar, automatic adjustment with PLC and instant adjustment using <u>foot pedal or any appropriate mechanism</u>. Details should be provided. |
| 3 | Front view window/glass | <ul style="list-style-type: none"> • Type: Scratch and chemical resistant glass or appropriate material, details should be provided • Thickness (mm): 8-10 (\pm 10%) |
| 4 | Shelves | Minimum 3 height adjustable, full length stainless steel shelves |
| 5 | Feed through (leak proof) | <ul style="list-style-type: none"> • Electrical: Minimum 1, with minimum 1 outlet power strip • Extra: Minimum two blanked ISO KF 40 or One blanked KF-40 flange & one 3/8 inch stainless steel swage lock bulk head fitting |
| 6 | Filters | <ul style="list-style-type: none"> • 0.1-0.5 micron HEPA inlet/outlet filters (class H13 or better) |
| 7 | Main Anti chamber | <ul style="list-style-type: none"> • Total: One • Material of construction: stainless steel • Door sealing mechanism: Spindle lock/ Gas piston type or appropriate • Dimensions (mm): Diameter 300 (\pm 5%) • Length: 600 (\pm 5%) • Vacuum better than 0.4-0.6 mbar or flow volume 10-15 m³/hr |
| 8 | Tray | Should consist of an stainless steel sliding tray, details should be provided |

| | | |
|----|---------------------------|--|
| 9 | Mini Ante chamber | <ul style="list-style-type: none"> • Total: One • Material of construction: stainless steel • Dimensions (mm): Diameter 150 ($\pm 5\%$) • Length: 300 ($\pm 5\%$) • Vacuum better than 0.4-0.6 mbar or flow volume 10-15 m³/hr |
| 10 | Glove ports | <ul style="list-style-type: none"> • Total: Two • Port material: <u>Chemical resistant material</u> details should be provided • Diameter: 200 mm ($\pm 10\%$), • Sealing: O ring sealed |
| 11 | Gloves | <ul style="list-style-type: none"> • Material: Chemical resistant Butyl or any appropriate, details should be provided • Thickness: 0.4-0.6 mm ($\pm 10\%$) • Size: medium or large |
| 12 | Vacuum pump | <ul style="list-style-type: none"> • Type: Rotary vane mechanical pump or better with necessary moisture and vapour traps for vacuum pump, details should be provided • Vacuum better than 0.3-0.5 mbar or flow volume 10-15 m³/hr |
| 13 | Flow piping and fittings | Should be made of stainless steel |
| 14 | Electrical | <ul style="list-style-type: none"> • Lighting: Internal LED light assembly/ fluorescent lamp • Operating voltage: 230 V ($\pm 10\%$), 50 Hz |
| 15 | Control system | PLC controlled of all basic functions & monitoring of box parameters with 6 inch ($\pm 10\%$) monochrome/colour panel. Details of PLC and functioning should be provided. |
| 16 | Oxygen probes/analyzers | <ul style="list-style-type: none"> • Measuring range: 0-1000 ppm ($\pm 10\%$) • Accuracy: +/- 1ppm in full range. • Repeatability: +/- 1% in full range • Resolution: +/- 0.1% in full range • Probe/ analyzer type to be provided • In-house calibration procedures to be provided |
| 17 | Moisture probes/analyzers | <ul style="list-style-type: none"> • Measuring range: 0-500 ppm ($\pm 10\%$) • Accuracy: +/- 2 °C DP • Probe/ analyzer type to be provided |
| 18 | Regeneration | Automatic regeneration of purifier through PLC control or appropriate procedure, details to be provided |

| | | |
|----|--|---|
| 19 | Purifier unit | <ul style="list-style-type: none"> • Capacity: Oxygen: Approx. 30L ($\pm 10\%$) and Moisture (H_2O): approx. 1300 g ($\pm 10\%$) • Should consist of purification columns, details should be provided • Should have appropriate filters or arrangement for vapour removal, details should be provided • Details of quantity of molecular sieve and copper catalyst in the reactor should be provided • Should preferably have easy fill and replacement ports required for replacement of catalyst |
| 20 | Stand | Should consist a stand with locking and levelling casters |
| 21 | Blower | <ul style="list-style-type: none"> • Should consist of fixed speed/ single stage or appropriate blower. Blower type and its capacity to be provided • Chiller to be provided if required to cool the blower |
| 22 | Valves | <p>Preferably should have the following valves</p> <ul style="list-style-type: none"> • Main Purifier valve: Electro-pneumatic, KF-40 or any suitable • Control valves: Electromagnetic (solenoid) or any suitable • Antechamber valves: Manual KF-25 Valves or any suitable • Manual valves: Swagelok Ball valves or any suitable |
| 23 | Power | 240 \pm 10 V, 50 Hz, details of receptacle/socket to be provided |
| 24 | Guarantee/ Warranty | • The entire equipment should be guaranteed for a period of 5 year from the date of commissioning. |
| 25 | Qualification Criteria & Other Aspects | <ul style="list-style-type: none"> • The vendor should have supplied minimum two systems in India and details should be furnished. • Should have agents in India to provide after sales service, support and maintenance • Photographs and catalogues related to machine should be enclosed in the offer • Dimensions of equipment, weight and space requirements should be submitted in technical offer. • Two hard copies of all the operational manuals related to the system have to be provided while supplying the system. |
| 26 | Training | Training should be provided for the system operation and maintenance |
| 27 | Compliance Statement | Compliance statement of specification to be submitted along with the offer. |
| 28 | Spares | Price of essential spares and consumables should be provided |

14. Specifications for Temperature Controlled Hot Plate and accessories(2 sets)

- Dimensions 240 x 85 x 370 (W x H x L in mm)
- Glass ceramic area 235 x 235 mm
- Weight 3.8 Kg. (Approx.)

- d. Diameter of Heating Zone 155 mm
- e. Voltage 230/240 V
- f. AC Power Consumption 0.9 KW
- g. Max. Heating zone approx. 555 °C.
- h. Min time to reach boiling 15 min. Point of 1 ltr. Of water
- i. Stirrer Integrated
- j. Min./Max. Speed 100 to 1100 revolutions/min
- k. Stirring volume Max 20 ltr. of water
- l. Temperature control: possible between 25 to 200 °C

15. Specifications for UPS - 20 KVA with 30 Minutes power backup and accessories

- 1) UPS SYSTEMS– Emerson/Liebert make UPS Systems for IT Networks & Industrial Applications; Range from 600VA to 4800 KVA for Power Conditioning & Backup Solutions.
- 2) Battery Banks (Tubular, SMF, Ni-Cd, in 2V and 12V configs.) We offer wide range of Batteries for UPS Systems, DC supplies for Telecom applications, Generators etc..
- 3) Solar Power System – Design and deployment of Solar Power Plants of capacities of 1Kva to 5) MW. Grid Connect Solar Invertors from Kaco, Germany and Hybrid from Emerson.
- 4) SPD/TVSS – A wide range of Transient voltage surge suppression solutions for critical IT, Telecom & industrial Applications.
- 5) Avocent range of products like smart PDUs (Power Distribution Units) for IT networks, monitoring Solutions for Data Centres and Server Rooms.
- 6) NPS and ATS for providing redundancy in power supplies.
- 7) Power Services: Support/Maintenance Services for UPS Systems, Electrical Systems, Battery Banks Etc..
- 8) Power Quality Audits for Energy Efficiency and solutions for Controlling Power Factor and Power Harmonics.
- 9) Precision AC solutions for Data Centre and Server Rooms.
- 10) Design and Deployment of Data Centres, Telecom/IT NOC Centres, AV Rooms, Server Rooms etc..
- 11) Electrical Infrastructure like Panels, cabling, monitoring and control Systems etc..
- 12) Electrical Peripherals like Isolation Transformers, Servo Stabilizers, Electrical Panels etc..
- 13) Phase Sequence Correctors, Products for improving Power Factor and Harmonics.

16. Specifications for Vibration Free Table- 1.5m(l)x 0.8m(w)x0.7m(h) and accessories

| | |
|--|--------------|
| Vertical Resonant Frequency | 1.25 Hz |
| Horizontal Resonant Frequency | 1.0 Hz |
| Vertical Transmissibility at Resonance | 10 dB |
| Horizontal Transmissibility at Resonance | 12 dB |
| Vertical Transmissibility at 5Hz | -20 dB (90%) |
| Horizontal Transmissibility at 5Hz | -24 dB (94%) |

| | |
|-------------------------------------|------------------|
| Vertical Transmissibility at 10Hz | -32.5 dB (97.5%) |
| Horizontal Transmissibility at 10Hz | -30 dB (97%) |
| Maximum Load Capacity (set of four) | 600 - 800 kg |
| Height Adjustment Range | -10 mm, +5 mm |
| Self Levelling Repeatability | ± 0.5 mm |
| Height | 700 mm |
| Air Pressure (Maximum) | 80 psi |
| Finish | Black Paint |

17. Specifications for Optical Bench- 1.5m(l)x 0.8m(w)x0.7m(h) and accessories

Dimension: Length x Width x Height – 2400x1500x240 mm; Mention about the load capacity of the table top

M6 threaded holes (sealed holes) with 25 mm grid pattern;

Honeycomb structure with very good damping arrangement (Please mention about the structure and damping arrangement);

Stainless Steel top and bottom skins with at least 4.8 mm thickness and surface flatness of at least ±0.1 mm or better over 500 x 500 mm area or better. This is very important for optical alignment. Preference will be given to the table top which has large surface area flatness;

Other parameter: deflection under load <math> < 1.5 \times 10^{-3}</math> mm, relative motion <math> < 3.0 \times 10^{-7}</math> mm, Dynamic deflection coefficient <math> < 1 \times 10^{-3}</math> and provide other necessary parameters;

Specifications for Isolator legs:

Give information about the height and load capacity of the legs. We expect a minimum load capacity of 600 kg per leg; height adjustment of at least 25 mm;

Settling time should be better than 2 sec (Preference will be given for shorter settling time);

Releveling accuracy: better than ± 0.5 mm

Horizontal damping preferably by oil

Horizontal Isolation: 5 Hz ≥ 85%; 10 Hz ≥ 95%; Horizontal Isolation Resonance ≤ 1.5 Hz;

Vertical Isolation: 5 Hz ≥ 90%; 10 Hz ≥ 95%; Vertical Isolation Resonance ≤ 1.0 Hz;

Horizontal and Vertical amplification at resonance: better than or equal to 10 dB;

Mention about other facilities and features with the isolators.

Compressor: Supply air compressor with suitable specifications for this optical table. Operating noise should be very less (Preference will be given for less noise compressor). Mention about the accessories which will be part of the compressor.

18. Specification for Wet Benches and accessories (Quantity- 2 pcs.)

| | |
|-------------------|--|
| Usage/Application | Nanotechnology Laboratory |
| Brand | Bio-cleanair |
| Material | Steel |
| Capacity | Single User |
| Lighting | 300-400 lux. on the worktable |
| Features | The complete work area line with Polypropylene |
| Lighting Type | Fluorescent tube with diffused |
| Color | Pure White |
| Voltage | 310 V |
| Air Flow | 1000 CFM |

| | |
|------------------------|---------------------------|
| Maximum Wafer Diameter | 150 mm (6 in) |
| Size | W 1200 x W 700 x H 700 mm |

19. Labor cost of 1 personal for 5 years is required and warranty of 5 years for all the above items.

20. Specifications for Fume Hood and accessories

Dimension: 1800 mm W X 900 mm D X 2400 mm H

Design Structure: Aerodynamic, Floor mounted

Airflow Type: Low Constant Volume (for A.C. environment)

Color: Combination Grey & White

Powder coating: Pre-treated with 8 tank chemical processes and powder coated with highly chemical resistant material having appropriate dry film thickness.

Material of Construction: Galvanized Iron (GI) as per IS 277: 2003 standard

Front Top Panel: Easily openable hinged Top Panel for easy access to Flow Control Valve and Electrical Lighting fixtures for maintenance.

Corner Post: Triangular profiled Corner Post should be placed on Left and Right Hand Side of the Fume hood for the utility line fittings and electrical receptacles.

Construction (Interior): Chemical & Heat Resistant, Fire Retardant, Smooth Finish, Easily Cleanable Panels should be made out of durable PRL integral workwalls.

Active Kinetics exhaust system: Interstitial 7-point active kinetics exhaust system (for light, normal & heavy fumes) with baffle to ensure rapid exhaust of fumes.

Airfoil: Aerodynamic Design, Horizontal fixed airfoil mounted on the worktop made of SS.

Worktop: Chemical resistant splash & spillage proof dished 'Jet Black Granite' worktop (18 +1 mm thick). Skirting of 15 mm from all sides for no chemical spillage. Sink, Water tap with drain arrangement. Worktop will have sink sealed with silicon sealant for drainage with water tap on left back side of worktop. Sink will have a trap for waste collection.

Sash (Shutter): Vertical rising sash counter-balanced with pulley and counter weight system. Toughened Float Glass sash (4 mm thick). Smooth hand light sash operation. Clear open able height = 750 mm. Impact Resistance of the sash (Toughened Glass) is four times higher than other sash materials (like Safety Glass and Polycarbonate). Breaking Stress value for fully toughened glass (Tempered Glass) = 24,000 psi.

Wet & Dry Service valves: Remotely operated Color coded Brass Needle Valves for fine control over utilities total 6 nos. service valves with PU plumbing with 6 mm internal dia, withstands up to 5 kgf pressure.

21. Specifications for Distillation plant and accessories

Specifications for Distillation

Water Specifications

| | |
|--|--|
| Resistivity at 25 °C* | Typically 10-15 MΩ•cm |
| TOC | < 30 ppb |
| Production flow Rate | 3 L/h (Elix [®] Advantage 3) 5 L/h (Elix [®] Advantage 5) 10 L/h (Elix [®] Advantage 10) 15 L/h (Elix [®] Advantage 15) |
| From an E-POD [®] dispenser with final filter, the following water quality specifications are achieved: | |
| Particulates (size > 0.22 µm)** | < 1 particulate/mL |
| Bacteria** | < 0.1 CFU/mL |
| Pyrogens (endotoxins)*** | < 0.001 EU/mL |

| | |
|--|---|
| RNases*** | < 0.01 ng/mL |
| Dnases*** | < 4 pg/μL |
| Flow rate | Up to 2 L/min |
| * Resistivity can also be displayed non-temperature-compensated as required by USP | |
| ** | With Millipak [®] final filter |
| *** | With Biopak [®] Polisher |

Feed water

| | |
|---|--|
| Feed water quality | Potable tap water as described in US-EPA, EP and WHO norms |
| Feed water connection | 1/2" Gaz M |
| Feed water pressure* | 1-6* bar |
| Feed water temperature | 5 – 35 °C |
| * For pressure above 6 bar, a pressure regulator needs to be installed upstream of the system | |

System Specifications

Production unit

| | |
|---|--|
| Dimensions (H x W x D) | 500 x 346 x 484 mm (19.7 x 13.6 x 19.0 in) |
| Operating weight | 24.4 - 26.4 kg (53.8 - 58.0 lb) |
| Electric power supply voltage | 100 - 230 V +/- 10% |
| Electric power supply frequency | 50 - 60 Hz +/- 10% |
| Elix [®] Advantage main unit data connection | Ethernet (RJ45) |

E-POD[®] dispenser

| | |
|---|------------------------------|
| Dimensions (H x D) | 579 x 230 mm (22.8 x 9.0 in) |
| Operating weight | 4.7 kg (12.1 lb) |
| Dispenser tubing length | 0.8 m (31.5 in) |
| Distance from production unit to E-POD [®] | 2.9 m (9.5 ft) |
| Electric power cable length | 2.9 m (9.5 ft) |
| E-POD [®] data connection | Parallel port (25-pin D-Sub) |

22.Specifications for Acid - Chemical Chambers and accessories

- Dimension (mm): 600 (W) x 400 (D) x 1000 (H) mm
- Tanks should have cascade water flow system
- Provisions for inlet, drain, overflow, heaters, thermometers, recycling, air agitation, cathode movement, dosing, sampling, slant bottom for sludge collection
- Covering hoods for long pickling lines
- Fumes extraction system including impellor, scrubber system, ducting and chimney can also be provided
- UV Protection, Fire retardant, Lifting Hooks, Static grounding arrangements
- Corrosion resistance & Chemical Resistance
- Leak-proof

23. Specifications for Dishwasher for cleaning glass wafers and accessories

Technical Specification

Dimensions (W x D x H (mm)): 600 x 600 x 850

Capacity: 14 Place

Wash program: True Steam, Quad Wash, Dual Wash, Quite, Turbo, Auto, Eco, Gentle, Quick

Noise Level: 45db, Time Delay: 1-19 hr, Basic Program: Yes, Refill Indicator: Yes, Auto Restart: Yes,

Delay Start: Yes, Error Display: Yes, Quick wash: Yes

Part-3

Contract

Section VII. General Conditions of Contract

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Section VII. General Conditions of Contract

1 Definitions

1.1 The following words and expressions shall have the meanings hereby assigned to them:

- (a) “University” means Banaras Hindu University established under Banaras Hindu University Act 1915 .
- (b) “Contract” means the Contract Agreement entered into between the Purchaser and the Supplier, together with the Contract Documents referred to therein, including all attachments, appendices, and all documents incorporated by reference therein.
- (c) “Contract Documents” means the documents listed in the Contract Agreement, including any amendments thereto.
- (d) “Contract Price” means the price payable to the Supplier as specified in the Contract Agreement, subject to such additions and adjustments thereto or deductions therefrom, as may be made pursuant to the Contract.
- (e) “Day” means calendar day.
- (f) “Completion” means the fulfillment of the Related Services by the Supplier in accordance with the terms and conditions set forth in the Contract.
- (g) “GCC” means the General Conditions of Contract.
- (h) “Goods” means all of the commodities, raw material, machinery and equipment, and/or other materials that the Supplier is required to supply to the Purchaser under the Contract.
- (i) “The Project Site,” term where applicable, means the place of work named in the Special Conditions of Contract (SCC).
- (j) “Purchaser” means Banaras Hindu University, institute, faculty, department and other entities of the University competent for purchasing Goods and Services, as specified in the SCC.
- (k) “Related Services” means the services incidental to the supply of the goods, such as insurance, installation, training and initial maintenance and other such obligations of the Supplier under the Contract.
- (l) “SCC” means the Special Conditions of Contract.
- (m) “Subcontractor” means any person, private or government entity, or a combination of the above, to whom any part of the Goods to be supplied or execution of any part of the Related Services is subcontracted by the Supplier.

- (n) “Supplier” means the person, private or government entity, or a combination of the above, whose bid to perform the Contract has been accepted by the Purchaser and is named as such in the Contract Agreement.
- (o) “The Project Site,” where applicable, means the place named in the SCC.

2 Contract Documents

2.1 Subject to the order of precedence set forth in the Contract Agreement, all documents forming the Contract (and all parts thereof) are intended to be correlative, complementary, and mutually explanatory. The Contract Agreement shall be read as a whole.

3 Corrupt and Fraudulent Practices

- 3.1 The University requires compliance with its policy against the corrupt and fraudulent practices as set forth Section- V.
- 3.2 The Purchaser requires the Supplier to disclose any commissions or fees that may have been paid or are to be paid to agents or any other party with respect to the bidding process or execution of the Contract. The information disclosed must include the name and address of the agent or other party, the amount and currency, and the purpose of the commission, gratuity or fee.

4 Interpretation

- 4.1 Unless the context requires otherwise, singular means plural and vice versa.
- 4.2 The Contract constitutes the entire agreement between the Purchaser and the Supplier and supersedes all communications, negotiations and agreements (whether written or oral) of the parties with respect thereto made prior to the date of Contract.
- 4.3 Amendment

No amendment or other variation of the Contract shall be valid unless it is reduced to writing, dated, expressly refers to the Contract, and is signed by the duly authorized representative of each party thereto.
- 4.4 Nonwaiver
 - a. Subject to GCC Sub-Clause 4.5(b) below, no relaxation, forbearance, delay, or indulgence by either party in enforcing any of the terms and conditions of the Contract or the granting of time by either party to the other shall prejudice, affect, or restrict the rights of that party under the Contract, neither shall any waiver by either party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.
 - b. Any waiver of a party’s rights, powers, or remedies under the Contract must be in writing, dated, and signed by an

authorized representative of the party granting such waiver, and must specify the right and the extent to which it is being waived.

4.5 Severability

If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract.

5 Language

5.1 The Contract as well as all correspondence and documents relating to the Contract exchanged by the Supplier and the Purchaser, shall be written in the language specified in the SCC. Supporting documents and printed literature that are part of the Contract may be in any language provided they are accompanied by an accurate translation of the relevant passages in the language specified, in which case, for purposes of interpretation of the Contract, such translation shall govern.

5.2 The Supplier shall bear all costs of translation to the governing language and all risks of the accuracy of such translation, for documents provided by the Supplier.

6 Joint Venture, Consortium or Association

6.1 If the Supplier is a joint venture, consortium, or association, all of the parties shall be jointly and severally liable to the Purchaser for the fulfilment of the provisions of the Contract and shall designate one party to act as a leader with authority to bind the joint venture, consortium, or association. The composition or the constitution of the joint venture, consortium, or association shall not be altered without the prior consent of the Purchaser.

7 Eligibility

7.1 The Bidder should not have been declared insolvent by the competent court.

7.2 The Bidder should not be disqualified for contract under the law of the land.

7.3 The Bidder should not be adjudged defaulter of Tax Payment under Income Tax Law or any other Law for the time being in-force.

7.4 The Supplier and its Subcontractors shall have the nationality of an eligible country. A Supplier or Subcontractor shall be deemed to have the nationality of a country if it is a citizen or constituted, incorporated, or registered, and operates in conformity with the provisions of the laws of that country. Nationality must be disclosed by the supplier

7.5 All Goods and Related Services to be supplied under the Contract shall have their origin in Eligible Countries. For the

purpose of this Clause, origin means the country where the goods have been grown, mined, cultivated, produced, manufactured, or processed; or through manufacture, processing, or assembly, another commercially recognized article results that differs substantially in its basic characteristics from its components.

- 8 Notices**
- 8.1 Any notice given by one party to the other pursuant to the Contract shall be in writing to the address specified in the SCC. The term “in writing” means communicated in written form with proof of receipt.
- 8.2 A notice shall be effective when delivered or on the notice’s effective date, whichever is later.
- 9 Governing Law**
- 9.1 The Contract shall be governed by and interpreted in accordance with the laws of India, unless otherwise specified in the SCC.
- 9.2 Throughout the execution of the Contract, the Contractor shall comply with the import of goods and services prohibitions in India when
- (a) as a matter of law or official regulations, India prohibits commercial relations with that country; or
 - (b) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, India prohibits any import of goods from that country or any payments to any country, person, or entity in that country.
- 10 Settlement of Disputes**
- 10.1 The Purchaser and the Supplier shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.
- 10.2 If the parties have failed to resolve their dispute or difference by such mutual consultation, then either the Purchaser or the Supplier may give notice to the other party of its intention to settle the issue by arbitration, as hereinafter provided, as to the matter in dispute, no arbitration in respect of the matter be commenced unless such notice is given in accordance with this Clause for the final settlement of the matter. Arbitration may be commenced prior to or after delivery of the Goods under the Contract.
- 10.3 All questions, disputes and differences arising shall be referred by the Vice-Chancellor, Banaras Hindu University to the sole arbitrator for arbitration under the provision of the Arbitrations and Conciliation Act, 1996.

- 11 Obligations During Arbitrations** 11.1 Notwithstanding any reference to arbitration in Clause 10,
- (a) the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree; and
 - (b) the Purchaser shall pay any amount due to the Supplier.
- 12 Scope of Supply** 12.1 The Goods and Related Services to be supplied shall be as specified in the Schedule of Requirements.
- 13 Delivery and Documents** 13.1 Subject to GCC Sub-Clause 33.1, the Delivery of the Goods and Completion of the Related Services shall be in accordance with the Delivery and Completion Schedule specified in the Schedule of Requirements. The details of shipping and other documents to be furnished by the Supplier are specified in the SCC.
- 14 Supplier's Responsibilities** 14.1 The Supplier shall supply all the Goods and Related Services included in the Scope of Supply in accordance with GCC Clause 12, and the Delivery and Completion Schedule, as per GCC Clause 13.
- 15 Contract Price** 15.1 Prices charged by the Supplier for the Goods supplied and the Related Services performed under the Contract shall not vary from the prices quoted by the Supplier in its bid, with the exception of any price adjustments authorized in the SCC.
- 16 Terms of Payment** 16.1 Ordinarily, payments for services rendered or supplies made shall be released only after the services have been rendered or supplies appropriate to the requirement made. However in following cases advance payments may be made if specified in SCC:
- (i) Advance payment demanded by firms holding maintenance contracts for servicing of Air-conditioners, computers, other costly equipment, etc.
 - (ii) Advance payment demanded by firms against fabrication contracts, turnkey contracts etc.
- Such advance payment should not exceed the following limits :-
- (i) Thirty percent of the contract value to private firms;
 - (ii) Forty percent of the contract value to a State or central Government agency or a Public Sector Undertaking; or
 - (iii) In case of maintenance contract, the amount should not exceed the amount payable for six months under the contract.
- 16.2 The Supplier's request for payment shall be made to the

Purchaser in writing, accompanied by invoices describing, as appropriate, the Goods delivered and Related Services performed, and by the documents submitted pursuant to GCC Clause 13 and upon fulfilment of all other obligations stipulated in the Contract.

- 16.3 Payments shall be made promptly by the Purchaser, within ninety (90) days after submission of an invoice or request for payment by the Supplier, and after the Purchaser has accepted it.
- 16.4 The currencies in which payment shall be made to the supplier under this contract shall be Indian currency unless otherwise agreed.

17 Taxes and Duties

- 17.1 For goods manufactured outside India, the Supplier shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside India.
- 17.2 For goods Manufactured within India, the Supplier shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted Goods to the Purchaser.
- 17.3 If any tax exemptions, reductions, allowances or privileges may be available to the Supplier in India, the Purchaser shall use its best efforts to enable the Supplier to benefit from any such tax savings to the maximum allowable extent or country or origin, the supplies shall provide benefit from any such tax sowing to the purchaser.

18 Performance Security

- 18.1 If required as specified in the SCC, the Supplier shall, within twenty-one (21) days of the notification of contract award, provide a performance security for the performance of the Contract in the amount specified in the SCC.
- 18.2 The proceeds of the Performance Security shall be payable to the Purchaser as compensation for any loss resulting from the Supplier's failure to complete its obligations under the Contract.
- 18.3 As specified in the SCC, the Performance Security, if required, shall be denominated in the currency(ies) of the Contract or in a freely convertible currency acceptable to the Purchaser; and shall be in one of the format stipulated by the Purchaser in the SCC, or in another format acceptable to the Purchaser.
- 18.4 Performance security should remain valid for a period of sixty days beyond the date of completion of all contractual obligations of the supplier including warranty obligation.
- 18.5 Bid security shall be refunded to the successful bidder within 30 days of receipt of performance security.

19 Copyright

19.1 The copyright in all drawings, documents, and other materials containing data and information furnished to the Purchaser by the Supplier herein shall remain vested in the Supplier, or, if they are furnished to the Purchaser directly or through the Supplier by any third party, including suppliers of materials, the copyright in such materials shall remain vested in such third party.

20 Confidential Information

20.1 The Purchaser and the Supplier shall keep confidential and shall not, without the written consent of the other party hereto, divulge to any third party any documents, data, or other information furnished directly or indirectly by the other party hereto in connection with the Contract, whether such information has been furnished prior to, during or following completion or termination of the Contract. Notwithstanding the above, the Supplier may furnish to its Subcontractor such documents, data, and other information it receives from the Purchaser to the extent required for the Subcontractor to perform its work under the Contract, in which event the Supplier shall obtain from such Subcontractor an undertaking of confidentiality similar to that imposed on the Supplier under GCC Clause 20.

20.2 The Purchaser shall not use such documents, data, and other information received from the Supplier for any purposes unrelated to the contract. Similarly, the Supplier shall not use such documents, data, and other information received from the Purchaser for any purpose other than the performance of the Contract.

20.3 The obligation of a party under GCC Sub-Clauses 20.1 and 20.2 above, however, shall not apply to information that:

- a. now or hereafter enters the public domain through no fault of that party;
- b. can be proven to have been possessed by that party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other party; or
- c. otherwise lawfully becomes available to that party from a third party that has no obligation of confidentiality.

20.4 The above provisions of GCC Clause 20 shall not in any way modify any undertaking of confidentiality given by either of the parties hereto prior to the date of the Contract in respect of the Supply or any part thereof.

20.5 The provisions of GCC Clause 20 shall survive completion or termination, for whatever reason, of the Contract.

21 Subcontracting

21.1 The Supplier shall notify the Purchaser in writing of all subcontracts awarded under the Contract if not already specified in the bid. Such notification, in the original bid or later on shall not relieve the Supplier from any of its

obligations, duties, responsibilities, or liability under the Contract.

21.2 Subcontracts shall comply with the provisions of GCC Clauses 3 and 7.

22 Specifications and Standards

22.1 Technical Specifications and Drawings

(a) The Goods and Related Services supplied under this Contract shall conform to the technical specifications and standards mentioned in Section-VI, Schedule of Requirements and, when no applicable standard is mentioned, the standard shall be equivalent or superior to the official standards whose application is appropriate to the Goods' country of origin or India.

(b) Wherever references are made in the Contract to codes and standards in accordance with which it shall be executed, the edition or the revised version of such codes and standards shall be those specified in the Schedule of Requirements. During Contract execution, any changes in any such codes and standards shall be applied only after approval by the Purchaser and shall be treated in accordance with GCC Clause 33.

23 Packing and Documents

23.1 The Supplier shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the Contract. During transit, the packing shall be sufficient to withstand, without limitation, rough handling and exposure to extreme temperatures, salt and precipitation, and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the goods' final destination and the absence of heavy handling facilities at all points in transit.

23.2 The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract, including additional requirements, if any, specified in the SCC, and in any other instructions ordered by the Purchaser.

24 Insurance

24.1 Unless otherwise specified in the SCC, the Goods supplied under the Contract shall be fully insured—in a freely convertible currency from an eligible country—against loss or damage incidental to manufacture or acquisition, transportation, storage, and delivery, in accordance with the applicable Incoterms or in the manner specified in the SCC.

25 Transportation and Incidental

25.1 The Supplier is required under the Contract to transport the Goods to a specified place of final destination within India,

Services

defined as the Project Site, transport to such place of destination in India, including insurance and storage, as shall be specified in the Contract, shall be arranged by the Supplier, and related costs shall be included in the Contract Price"; or any other agreed upon trade terms (specify the respective responsibilities of the Purchaser and the Supplier)

25.2 The Supplier may be required to provide any or all of the following services, including additional services, if any, specified in SCC:

- (a) performance or supervision of on-site assembly and/or start up of the supplied Goods;
- (b) furnishing of tools required for assembly and/or maintenance of the supplied Goods;
- (c) furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied Goods;
- (d) performance or supervision or maintenance and/or repair of the supplied Goods, for a period of time agreed by the parties, provided that this service shall not relieve the Supplier of any warranty obligations under this Contract; and
- (e) training of the Purchaser's personnel, at the Supplier's plant and/or on-site, in assembly, start-up, operation, maintenance, and/or repair of the supplied Goods.

25.3 Prices charged by the Supplier for incidental services, if not included in the Contract Price for the Goods, shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged to other parties by the Supplier for similar services otherwise shall be at the cost of suppliers.

26 Inspections and Tests

26.1 The Supplier shall at its own expense and at no cost to the Purchaser carry out all such tests and/or inspections of the Goods and Related Services as are specified in the SCC.

26.2 The inspections and tests may be conducted on the premises of the Supplier or its Subcontractor, at point of delivery, and/or at the Goods' final destination, or in another place in India as specified in the SCC. Subject to GCC Sub-Clause 26.3, if conducted on the premises of the Supplier or its Subcontractor, all reasonable facilities and assistance, including access to drawings and production data, shall be furnished to the inspectors at no charge to the Purchaser.

26.3 The Purchaser or its designated representative shall be entitled to attend the tests and/or inspections referred to in GCC Sub-Clause 26.2, provided that the Purchaser bear all of its own costs and expenses incurred in connection with such attendance including, but not limited to, all traveling and board and lodging expenses.

26.4 Whenever the Supplier is ready to carry out any such test and inspection, it shall give a reasonable advance notice,

including the place and time, to the Purchaser. The Supplier shall obtain from any relevant third party or manufacturer any necessary permission or consent to enable the Purchaser or its designated representative to attend the test and/or inspection.

- 26.5 The Purchaser may require the Supplier to carry out any test and/or inspection not required by the Contract but deemed necessary to verify that the characteristics and performance of the Goods comply with the technical specifications codes and standards under the Contract, provided that the Supplier's reasonable costs and expenses incurred in the carrying out of such test and/or inspection shall be added to the Contract Price. Further, if such test and/or inspection impedes the progress of manufacturing and/or the Supplier's performance of its other obligations under the Contract, due allowance will be made in respect of the Delivery Dates and Completion Dates and the other obligations so affected.
- 26.6 The Supplier shall provide the Purchaser with a report of the results of any such test and/or inspection.
- 26.7 The Purchaser may reject any Goods or any part thereof that fail to pass any test and/or inspection or do not conform to the specifications. The Supplier, if permitted by the purchaser, shall either rectify or replace such rejected Goods or parts thereof or make alterations necessary to meet the specifications at no cost to the Purchaser, and shall repeat the test and/or inspection, at no cost to the Purchaser, upon giving a notice pursuant to GCC Sub-Clause 26.4.
- 26.8 The Supplier agrees that neither the execution of a test and/or inspection of the Goods or any part thereof, nor the attendance by the Purchaser or its representative, nor the issue of any report pursuant to GCC Sub-Clause 26.6, shall absolve the Supplier from any warranties or other obligations under the Contract.

27 Liquidated Damages

- 27.1 Except as provided under GCC Clause 32, if the Supplier fails to deliver any or all of the Goods by the Date(s) of delivery or perform the Related Services within the period specified in the Contract, the Purchaser may without prejudice to all its other remedies under the Contract, deduct from the Contract Price, as liquidated damages, a sum equivalent to the percentage specified in the SCC of the delivered price of the delayed Goods or unperformed Services for each week or part thereof of delay until actual delivery or performance, up to a maximum deduction of the percentage specified in those SCC. Once the maximum is reached, the Purchaser may terminate the Contract pursuant to GCC Clause 33.

28 Warranty

- 28.1 The Supplier warrants that all the Goods are new, unused, and of the most recent or current models, and that they incorporate all recent improvements in design and materials,

unless provided otherwise in the Contract.

- 28.2 Subject to Sub-Clause 22.1(b) of GCC, the Supplier further warrants that the Goods shall be free from defects arising from any act or omission of the Supplier or arising from design, materials, and workmanship, under normal use in the conditions prevailing in India.
- 28.3 Unless otherwise specified in the SCC, the warranty shall remain valid for twelve (12) months after the Goods, or any portion thereof as the case may be, have been delivered to and accepted at the final destination indicated in the SCC, or warranty period mentioned by supplier whichever period concludes later unless mutually agreed.
- 28.4 The Purchaser shall give notice to the Supplier stating the nature of any such defects together with all available evidence thereof, promptly following the discovery thereof. The Purchaser shall afford all reasonable opportunity for the Supplier to inspect such defects.
- 28.5 Upon receipt of such notice, the Supplier shall, within the period specified in the SCC, expeditiously repair or replace the defective Goods or parts thereof, at no cost to the Purchaser.
- 28.6 If having been notified, the Supplier fails to remedy the defect within the period specified in the SCC; the Purchaser may proceed to take within a reasonable period such remedial action as may be necessary, at the Supplier's risk and expense and without prejudice to any other rights which the Purchaser may have against the Supplier under the Contract.

29 Patent Indemnity

- 29.1 The Supplier shall, subject to the Purchaser's compliance with GCC Sub-Clause 29.2, indemnify and hold harmless the Purchaser and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of any nature, including attorney's fees and expenses, which the Purchaser may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright, or other intellectual property right registered.
- 29.2 If any proceedings are brought or any claim is made against the Purchaser arising out of the matters referred to in GCC Sub-Clause 29.1, the Purchaser shall promptly give the Supplier a notice thereof, and the Supplier may at its own expense and in the Purchaser's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.
- 29.3 The Purchaser shall, at the Supplier's request, afford all available assistance to the Supplier in conducting such proceedings or claim, and shall be reimbursed by the Supplier for all reasonable expenses incurred in so doing.

30 Force Majeure

- 30.1 For purposes of this Clause, “Force Majeure” means an event or situation beyond the control of the Supplier that is not foreseeable, is unavoidable, and its origin is not due to negligence or lack of care on the part of the Supplier. Such events may include, but not be limited to, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.
- 30.2 If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably possible, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.
- 30.3 The Supplier shall not be liable for forfeiture of its Performance Security, liquidated damages, or termination for default if and to the extent that its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

31 Change Orders and Contract Amendments

- 31.1 The Purchaser may at any time order the Supplier through notice in accordance GCC Clause 8, to make changes within the general scope of the Contract in any one or more of the following:
- (a) drawings, designs, or specifications, where Goods to be furnished under the Contract are to be specifically manufactured for the Purchaser;
 - (b) the method of shipment or packing;
 - (c) the place of delivery; and
 - (d) the Related Services to be provided by the Supplier.
- 31.2 If any such change causes an increase or decrease in the cost of, or the time required for, the Supplier’s performance of any provisions under the Contract, an equitable adjustment shall be made in the Contract Price or in the Delivery/Completion Schedule, or both, and the Contract shall accordingly be amended. Any claims by the Supplier for adjustment under this Clause must be asserted within twenty-eight (28) days from the date of the Supplier’s receipt of the Purchaser’s change order.
- 31.3 Prices to be charged by the Supplier for any Related Services that might be needed but which were not included in the Contract shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged to other parties by the Supplier for similar services.
- 31.4 Subject to the above, no variation in or modification of the terms of the Contract shall be made except by written

amendment signed by the parties.

32 Extensions of Time

- 32.1 If at any time during performance of the Contract, the Supplier or its subcontractors should encounter conditions impeding timely delivery of the Goods or completion of Related Services pursuant to GCC Clause 13, the Supplier shall promptly notify the Purchaser in writing of the delay, its likely duration, and its cause. As soon as practicable after receipt of the Supplier's notice, the Purchaser shall evaluate the situation and may at its discretion extend the Supplier's time for performance, in which case the extension shall be ratified by the parties by amendment of the Contract.
- 32.2 Except in case of Force Majeure, as provided under GCC Clause 32, a delay by the Supplier in the performance of its Delivery and Completion obligations shall render the Supplier liable to the imposition of liquidated damages pursuant to GCC Clause 26, unless an extension of time is agreed upon, pursuant to GCC Sub-Clause 34.1.

33 Termination

33.1 Termination for Default

- (a) The Purchaser, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Supplier, may terminate the Contract in whole or in part:
- (i) if the Supplier fails to deliver any or all of the Goods within the period specified in the Contract, or within any extension thereof granted by the Purchaser pursuant to GCC Clause 32;
 - (ii) if the Supplier fails to perform any other obligation under the Contract; or
 - (iii) if the Supplier, in the judgment of the Purchaser has engaged in fraud and corruption, as defined in GCC Clause 3, in competing for or in executing the Contract.
- (b) In the event the Purchaser terminates the Contract in whole or in part, pursuant to GCC Clause 33.1(a), the Purchaser may procure, upon such terms and in such manner as it deems appropriate, Goods or Related Services similar to those undelivered or not performed, and the Supplier shall be liable to the Purchaser for any additional costs for such similar Goods or Related Services. However, the Supplier shall continue performance of the Contract to the extent not terminated.

33.2 Termination for Insolvency.

- (a) The Purchaser may at any time terminate the Contract by giving notice to the Supplier if the Supplier becomes bankrupt or otherwise insolvent. In such event,

termination will be without compensation to the Supplier, provided that such termination will not prejudice or affect any right of action or remedy that has accrued or will accrue thereafter to the Purchaser.

33.3 Termination for Convenience.

- (a) The Purchaser, by notice sent to the Supplier, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Purchaser's convenience, the extent to which performance of the Supplier under the Contract is terminated, and the date upon which such termination becomes effective.
- (b) The Goods that are complete and ready for shipment within twenty-eight (28) days after the Supplier's receipt of notice of termination shall be accepted by the Purchaser at the Contract terms and prices. For the remaining Goods, the Purchaser may elect:
 - (i) to have any portion completed and delivered at the Contract terms and prices; and/or
 - (ii) to cancel the remainder and pay to the Supplier an agreed amount for partially completed Goods and Related Services and for materials and parts previously procured by the Supplier.

34 Assignment

- 34.1 Neither the Purchaser nor the Supplier shall assign, in whole or in part, their obligations under this Contract, except with prior written consent of the other party.

Section VIII. Special Conditions of Contract

The following Special Conditions of Contract (SCC) shall supplement and / or amend the General Conditions of Contract (GCC). Whenever there is a conflict, the provisions herein shall prevail over those in the GCC.

| GCC Clause Ref. No. | SCC |
|------------------------|---|
| GCC 1.1 (i) | The Purchaser's country is: India. |
| GCC 1.1 (k) | The Purchaser is: Coordinator, SATHI, BHU, Varanasi-221005 |
| GCC 1.1 (j) | The Project Site(s)/Final Destination(s) is/are: CDC Building, BHU, Varanasi -221005 |
| GCC 5.1 | The language shall be: Hindi or English |
| GCC 8.1 | For notices, the Purchaser's address shall be: Attention : Prof. Anil Kumar Tripathi Street Address : Institute of Science, BHU, Varanasi Floor/ Room number : Director Office City : Varanasi ZIP Code : 221005 Country : India Telephone : 91-542-0000000 91-9451525811 Facsimile number : 91-542-0000000 Electronic mail address : <u>directoris@bhu.ac.in</u> |
| GCC 9.1 | The governing law shall be the law of India. |
| GCC 10.2 | The rules of procedure for arbitration proceedings pursuant to GCC Clause 10.2 shall be as follows: <i>Contracts with Supplier for arbitral proceeding</i> In the case of a dispute between the Purchaser and a Supplier, the dispute shall be referred to adjudication or arbitration in accordance with the laws of India by the arbitrator appointed by vice-chancellor, BHU, unless otherwise agreed. |
| GCC 13.1 | Details of Shipping and other Documents to be furnished by the Supplier are: (i) An airway bill (ii) Insurance Certificate, (iii) Manufacturer's or Supplier's Warranty Certificate, (iv) Inspection Certificate issued by nominated inspection agency, (v) Supplier's factory shipping details etc. |

| | |
|-----------------|--|
| | The above documents shall be received by the Purchaser before arrival of the Goods and, if not received, the Supplier will be responsible for any consequent expenses. |
| GCC 15.1 | The prices charged for the Goods supplied and the related Services performed shall not be adjustable. |
| GCC 16.1 | <p>GCC 16.1—The method and conditions of payment to be made to the Supplier under this Contract shall be as follows:</p> <p>Payment for Goods supplied from abroad:</p> <p>Payment of foreign currency portion shall be made in Indian Rupees in the following manner:</p> <p>(i) On Shipment: Ninety (80%) percent of the Contract Price of the Goods shipped shall be paid through irrevocable confirmed letter of credit opened in favor of the Supplier in a bank in its country, upon receiving equipment in good condition and documents specified in GCC Clause 13.1 under Section-VII.</p> <p>(ii) On Acceptance: Remaining (20%) percent of the Contract Price of Equipment received shall be paid within thirty (30) days of receipt of the equipment upon submission of claim supported by the acceptance certificate issued by the Purchaser by bank draft/wire transfer.</p> <p>Payment of local currency portion shall be made in Indian Rupees within thirty (30) days of presentation of claim supported by a certificate from the Purchaser declaring that the Goods have been delivered and that all other contracted Services have been performed.</p> <p>Payment for Goods and Services supplied from within India:</p> <p>Payment for Goods and Services supplied from within India shall be made in Indian Rupees, as follows:</p> <p>(i) On Delivery & Acceptance: Hundred (100%) percent of the Contract Price shall be paid on receipt of the Goods in good conditions and acceptance certificate for satisfactory installation and functioning.</p> |
| GCC 18.1 | A Performance Security shall be required @ 10% of contract price including INR components. |
| GCC 18.3 | <p>If required, the Performance Security shall be in the form of : Bank Guarantee</p> <p>If required, the Performance security shall be denominated in Indian Rupees.</p> |
| GCC 23.2 | The packing, marking and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract. |
| GCC 24.1 | The insurance coverage shall be as specified in the Incoterm®2010. |

| | |
|-----------------|---|
| | If not in accordance with Incoterm®2010 insurance shall be as follows: NA |
| GCC 25.1 | Responsibility for transportation of the Goods shall be as specified in the Incoterm®2010 . If not in accordance with Incoterm®2010 , responsibility for transportations shall be as follows: NA |
| GCC 25.2 | Incidental services to be provided are: Selected services covered under GCC Clause 25.2 and/or other should be specified with the desired features. The price quoted in the bid price or agreed with the selected Supplier shall be included in the Contract Price. |
| GCC 26.1 | The inspections and tests shall be: Equipment should be installed at site by designated engineer of the firm. Demonstration should be made to the satisfaction of the P.I. At least four free visits should be made by the engineer during the first year after installation to clarify and rectify any doubts or problems as may be faced by the user. |
| GCC 26.2 | The Inspections and tests shall be conducted at the Department where the equipment is installed. For the rest please refer to GCC 26.1. |
| GCC 27.1 | The liquidated damage shall be: 1% per week |
| GCC 27.1 | The maximum amount of liquidated damages shall be: 10% of PO value |
| GCC 28.3 | The period of validity of the Warranty shall be 05 Years from date of acceptance/ satisfactory installation of the equipment. For purposes of the Warranty, the place(s) of final destination(s) shall be the Department where the equipment is installed. The Supplier shall, in addition, comply with the performance and/or consumption guarantees specified under the Contract (if any). If, for reasons attributable to the Supplier, these guarantees are not attained in whole or in part, the Supplier shall, at its discretion, either: (a) make such changes, modifications, and/or additions to the Goods or any part thereof as may be necessary in order to attain the contractual guarantees specified in the Contract at its own cost and expense and to carry out further performance tests in accordance with SCC 4, or (b) pay liquidated damages to the Purchaser with respect to the failure to meet the contractual guarantees. The rate of these liquidated damages shall be 1% per week of actual value of the equipment |

| | |
|-----------------|---|
| | (maximum 10%). |
| GCC 28.5 | The period for repair or replacement shall be: not exceed 07 days. |

Part-4
Bidding Forms &
Contract Forms

Section IX: Bidding Forms

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(i) Tender Form

(Techno commercial un-priced Bid)

(On the letter head of the firm submitting the bid)

Tender No.

To

The _____

Dear Sir,

1. I/We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders;
2. I/We meet the eligibility requirements and have no conflict of interest ;
3. I/We have not been suspended nor declared ineligible in India;
4. I/We offer to supply in conformity with the Bidding Documents and in accordance with the Delivery Schedules specified in the Schedule of Requirements the following Goods: *[insert a brief description of the Goods and Related Services]*;
5. I/We offer to supply the items as listed in the schedule to this tender hereto/portion thereof as you may specify in the acceptance of Tender at the price given in the said Schedule and agree to hold this offer open for a period of 90 days from the date of opening of the tender.
6. I/we shall be bound by a communication of acceptance issued by you.
7. I/We have understood the Instruction to bidders and Conditions of Contract in the form as enclosed with the invitation to the tender and have thoroughly examined the specifications quoted in the Schedule hereto and am/are fully aware of the nature of the goods required and my/our offer is to supply the goods strictly in accordance with the specifications and requirements.
8. A crossed Bank Draft in favor of the Registrar, BHU for Rs. (Rupees.....only) as Earnest Money is enclosed. The Draft is drawn onBank payable at Varanasi.

9. The following have been added to form part of this tender.
- (a) Samples of items quoted for, as per instructions provided in the schedule of requirement.
 - (b) Schedule of requirements, quoting the make only duly signed and stamped.(without indicating price)
 - (c) Income Tax clearance certificate.
 - (d) Copy of last audited balance sheet.
 - (e) Copy of Valid Central/State sales tax registration certificate.
 - (f) Copy of relevant major purchase orders valuing more than Rs. 20000/- executed during last two years for Govt. Depts., PSUs & Central Autonomous bodies..
 - (g) Proof of manufacturing Unit, dealership certificate/general order suppliers.
 - (h) Statement of deviations from financial terms & conditions, if any.
 - (i) Any other enclosure. (Please give details)
10. We undertake to execute all orders which have been placed to meet emergent requirements on priority basis.
11. Certified that the bidder is:
- (a) A sole proprietorship firm and the person signing the bid document is the sole proprietor/constituted attorney of the sole proprietor,
- Or**
- (b) A partnership firm, and the person signing the bid document is a partner of the firm and he has authority to refer to arbitration disputes concerning the business of the partnership by virtue of the partnership agreement/by virtue of general power of attorney.
- Or**
- (c) A company and the person signing the document is the constituted attorney.

(NOTE: Delete whatever is not applicable. All corrections/deletions should invariable be duly attested by the person authorized to sign the bid document).

12. We do hereby undertake that, until a formal notification of award, this bid, together with your written acceptance thereof shall constitute a binding contract between us.
13. If our bid is accepted, we commit to obtain a performance security in accordance with the Bidding Documents;
14. We are not participating, as a Bidder or as a subcontractor, in more than one bid in this bidding process, other than alternative bids submitted;
15. We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in any type of fraud and corruption

Name of the Bidder* **[insert complete name of person signing the Bid]**

Name of the person duly authorized to sign the Bid on behalf of the Bidder** **[insert complete name of person duly authorized to sign the Bid]**

Title of the person signing the Bid **[insert complete title of the person signing the Bid]**

Signature of the person named above **[insert signature of person whose name and capacity are shown above]**

Date signed _ **[insert date of signing]** day of **[insert month]**, **[insert year]**

*: In the case of the Bid submitted by joint venture specify the name of the Joint Venture as Bidder

** : Person signing the Bid shall have the power of attorney given by the Bidder to be attached with the Bid Schedules.

Yours faithfully,

(Signature of bidder)

Dated this day of _____

Address:

.....

.....

Telephone No. :_____

FAX_____

E-mail_____

Company seal

(ii) Tender Form

(Priced Bid)

(On the letter head of the firm submitting the bid document)

To,

The _____

Ref: Tender No.....Dated:

Sir,

Having examined the bidding documents and having submitted the techno commercial unpriced bid for the same, we, the undersigned, hereby submit the priced bid for supply of goods and services as per the schedule of requirements and in conformity with the said bidding documents.

1. We hereby offer to supply the Goods/Services at the prices and rates mentioned in the enclosed schedule of requirement.
2. We do hereby undertake that, in the event of acceptance of our bid, the supply of Goods/Services shall be made as stipulated in the schedule of requirement and that we shall perform all the incidental services.
3. The prices quoted are inclusive of all charges net F.O.R University. We enclose herewith the complete Financial Bid as required by you. This includes:
 - a. Price Schedule (Bill of Quantity-BOQ).
 - b. Statement of deviations from financial terms and conditions.
4. We agree to abide by our offer for a period of 90 days from the date fixed for opening of the bid documents and that we shall remain bound by a communication of acceptance within that time.
5. We have carefully read and understood the terms and conditions of the bid document and we do hereby undertake to supply as per these terms and conditions. The Financial Deviations are only those mentioned in the statement of deviations from financial terms and conditions.
6. We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract: **[insert complete name of each Recipient, its full address, the reason for which each commission or gratuity was paid and the amount and currency of each such commission or gratuity]**

| Name of Recipient | Address | Reason | Amount |
|-------------------|---------|--------|--------|
|-------------------|---------|--------|--------|

| | | | |
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| | | | |
| | | | |
| | | | |

(If none has been paid or is to be paid, indicate “none.”)

7. We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed; and
8. We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

Certified that the bidder is:

A sole proprietorship firm and the person signing the bid document is the sole proprietor/
constituted attorney of sole proprietor,

Or

A partnership firm, and the person signing the bid document is a partner of the firm and he has authority to refer to arbitration disputes concerning the business of the partnership by virtue of the partnership agreement/by virtue of general power of attorney,

Or

A company and the person signing the bid document is the constituted attorney.

(NOTE: Delete whatever is not applicable. All corrections/deletions should invariably be duly attested by the person authorized to sign the bid document.)

We do hereby undertake that, until a formal notification of award, this bid, together with your written acceptance thereof, shall constitute a binding contract between us.

Dated this day of _____

Signature of Bidder _____

Details of enclosures _____

Full Address: _____

Telephone No. _____

Mobile No. : _____

Fax No. : _____

E-mail: _____

Company Seal

Bidder Information Form

[The Bidder shall fill in this Form in accordance with the instructions indicated below. No alterations to its format shall be permitted and no substitutions shall be accepted.]

Date: *[insert date (as day, month and year) of Bid Submission]*

ADVT. No.: *[insert number of bidding process]*

Alternative No.: *[insert identification No if this is a Bid for an alternative]*

Page _____ of _____ pages

| |
|--|
| 1. Bidder's Name <i>[insert Bidder's legal name]</i> |
| 2. In case of JV, legal name of each member : <i>[insert legal name of each member in JV]</i> |
| 3. Bidder's actual or intended country of registration: <i>[insert actual or intended country of registration]</i> |
| 4. Bidder's year of registration: <i>[insert Bidder's year of registration]</i> |
| 5. Bidder's Address in country of registration: <i>[insert Bidder's legal address in country of registration]</i> |
| <p>6. Bidder's Authorized Representative Information</p> <p>Name: <i>[insert Authorized Representative's name]</i></p> <p>Address: <i>[insert Authorized Representative's Address]</i></p> <p>Telephone/Fax numbers: <i>[insert Authorized Representative's telephone/fax numbers]</i></p> <p>Email Address: <i>[insert Authorized Representative's email address]</i></p> |
| <p>7. Attached are copies of original documents of <i>[check the box(es) of the attached original documents]</i></p> <p><input type="checkbox"/> Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of registration of the legal entity named above.</p> <p><input type="checkbox"/> In case of JV, letter of intent to form JV or JV agreement.</p> <p><input type="checkbox"/> In case of Government-owned enterprise or institution, documents establishing:</p> <ul style="list-style-type: none"> • Legal and financial autonomy • Operation under commercial law • Establishing that the Bidder is not dependent agency of the Purchaser <p>2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.</p> |

Manufacturer's Authorization

[The Bidder shall require the Manufacturer to fill in this Form in accordance with the instructions indicated. This letter of authorization should be on the letterhead of the Manufacturer and should be signed by a person with the proper authority to sign documents that are binding on the Manufacturer. The Bidder shall include it in its bid, if so indicated in the BDS.]

Date: *[insert date (as day, month and year) of Bid Submission]*
ADVT. No.: *[insert number of bidding process]*
Alternative No.: *[insert identification No if this is a Bid for an alternative]*

To: *[insert complete name of Purchaser]*

WHEREAS

We *[insert complete name of Manufacturer]*, who are official manufacturers of *[insert type of goods manufactured]*, having factories at *[insert full address of Manufacturer's factories]*, do hereby authorize *[insert complete name of Bidder]* to submit a bid the purpose of which is to provide the following Goods, manufactured by us *[insert name and or brief description of the Goods]*, and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with Clause 28 of the General Conditions of Contract, with respect to the Goods offered by the above firm.

Signed: *[insert signature(s) of authorized representative(s) of the Manufacturer]*

Name: *[insert complete name(s) of authorized representative(s) of the Manufacturer]*

Title: *[insert title]*

Dated on _____ day of _____, _____ *[insert date of signing]*

Section X. Contract Forms

This Section contains forms which, once completed, will form part of the Contract. The forms for Performance Security and Advance Payment Security, when required, shall only be completed by the successful Bidder after contract award.

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Tender Acceptance Letter

(To be given on Company Letter Head)

Date:

Sub: Acceptance of Terms & Conditions of Tender.

Tender Reference No. _____

Name of Tender/ Work: -

Dear Sir,

1. I/We have downloaded/ obtained the tender document(s) for the above mentioned 'Tender/Work' from the web site(s) namely:

as per your advertisement, given in the above mentioned website(s).

2. I/We hereby certify that I/We have read the entire terms and conditions of the tender documents from Page No. _____ to _____ (including all documents like section(s), schedules(s) etc.), which form part of the contract agreement and I/we shall abide hereby by the terms/conditions/ clauses contained therein.
3. The corrigendum(s) issued from time to time by your department/ organisation too have also been taken into consideration, while submitting this acceptance letter.
4. I/We hereby unconditionally accept the tender conditions of above mentioned tender document(s)/ corrigendum(s) in its totality/entirety.
5. In case any provisions of this tender are found violated, then your department/organisation shall without prejudice to any other right or remedy be at liberty to reject this tender/bid including the forfeiture of the full said earnest money deposit absolutely.

Yours Faithfully,

(Signature of the Bidder, with Official Seal)

Contract Agreement

[The successful Bidder shall fill in this form in accordance with the instructions indicated]

THIS AGREEMENT made

the [*insert: number*] day of [*insert: month*], [*insert: year*].

BETWEEN

- (1) [*insert complete name of Purchaser*], a [*insert description of type of legal entity, for example, an agency of the Ministry of of the Government of { insert name of Country of Purchaser } , or corporation incorporated under the laws of { insert name of Country of Purchaser }*] and having its principal place of business at [*insert address of Purchaser*] (hereinafter called “the Purchaser”), of the one part, and
- (2) [*insert name of Supplier*], a corporation incorporated under the laws of [*insert: country of Supplier*] and having its principal place of business at [*insert: address of Supplier*] (hereinafter called “the Supplier”), of the other part :

WHEREAS the Purchaser invited bids for certain Goods and ancillary services, viz., [*insert brief description of Goods and Services*] and has accepted a Bid by the Supplier for the supply of those Goods and Services

The Purchaser and the Supplier agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other contract documents.
 - (a) the Letter of Acceptance
 - (b) the Tender Forms
 - (c) the Addenda Nos. _____ (if any)
 - (d) Special Conditions of Contract
 - (e) General Conditions of Contract
 - (f) the Specification (including Schedule of Requirements and Technical Specifications)
 - (g) the completed Schedules (including Price Schedules(BOQ))
 - (h) any other document listed in GCC as forming part of the Contract

3. In consideration of the payments to be made by the Purchaser to the Supplier as specified in this Agreement, the Supplier hereby covenants with the Purchaser to provide the Goods and Services and to remedy defects therein in conformity in all respects with the provisions of the Contract.
4. The Purchaser hereby covenants to pay the Supplier in consideration of the provision of the Goods and Services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of *[insert the name of the Contract governing law country]* on the day, month and year indicated above.

For and on behalf of the Purchaser

Signed: *[insert signature]*
in the capacity of *[insert title or other appropriate designation]*
in the presence of *[insert identification of official witness]*

For and on behalf of the Supplier

Signed: *[insert signature of authorized representative(s) of the Supplier]*
in the capacity of *[insert title or other appropriate designation]*
in the presence of *[insert identification of official witness]*

Performance Security

Option 1: (Bank Guarantee)

[The bank, as requested by the successful Bidder, shall fill in this form in accordance with the instructions indicated]

[Guarantor letterhead or SWIFT identifier code]

Beneficiary: *[insert name and Address of Purchaser]*

Date: *_ [Insert date of issue]*

PERFORMANCE GUARANTEE No.: *[Insert guarantee reference number]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that *_ [insert name of Supplier, which in the case of a joint venture shall be the name of the joint venture]* (hereinafter called "the Applicant") has entered into Contract No. *[insert reference number of the contract]* dated *[insert date]* with the Beneficiary, for the supply of *_ [insert name of contract and brief description of Goods and related Services]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in figures]* (_____) *[insert amount in words]*⁵, such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire, no later than the Day of, 2...⁶, and any demand for payment under it must be received by us at this office indicated above on or before that date.

⁵ The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance, and denominated either in the currency(ies) of the Contract or a freely convertible currency acceptable to the Beneficiary.

⁶ Insert the date twenty-eight days after the expected completion date as described in GC Clause 18.4. The Purchaser should note that in the event of an extension of this date for completion of the Contract, the Purchaser would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Purchaser might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months][one year], in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

[signature(s)]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

Option 2: Performance Bond

By this Bond *[insert name of Principal]* as Principal (hereinafter called “the Supplier”) and *[insert name of Surety]* as Surety (hereinafter called “the Surety”), are held and firmly bound unto *[insert name of Purchaser]* as Obligee (hereinafter called “the Supplier”) in the amount of *[insert amount in words and figures]*, for the payment of which sum well and truly to be made in the types and proportions of currencies in which the Contract Price is payable, the Supplier and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS the Contractor has entered into a written Agreement with the Purchaser dated the _____ day of _____, 20 ____, for *[name of contract and brief description of Goods and related Services]* in accordance with the documents, plans, specifications, and amendments thereto, which to the extent herein provided for, are by reference made part hereof and are hereinafter referred to as the Contract.

NOW, THEREFORE, the Condition of this Obligation is such that, if the Supplier shall promptly and faithfully perform the said Contract (including any amendments thereto), then this obligation shall be null and void; otherwise, it shall remain in full force and effect. Whenever the Supplier shall be, and declared by the Purchaser to be, in default under the Contract, the Purchaser having performed the Purchaser’s obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

- (1) complete the Contract in accordance with its terms and conditions; or
- (2) obtain a Bid or bids from qualified Bidders for submission to the Purchaser for completing the Contract in accordance with its terms and conditions, and upon determination by the Purchaser and the Surety of the lowest responsive Bidder, arrange for a Contract between such Bidder and Purchaser and make available as work progresses (even though there should be a default or a succession of defaults under the Contract or Contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the Balance of the Contract Price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term “Balance of the Contract Price,” as used in this paragraph, shall mean the total amount payable by Purchaser to Supplier under the Contract, less the amount properly paid by Purchaser to Contractor; or
- (3) pay the Purchaser the amount required by Purchaser to complete the Contract in accordance with its terms and conditions up to a total not exceeding the amount of this Bond.

The Surety shall not be liable for a greater sum than the specified penalty of this Bond.

Any suit under this Bond must be instituted before the expiration of one year from the date of the issuing of the Taking-Over Certificate.

No right of action shall accrue on this Bond to or for the use of any person or corporation other than the Purchaser named herein or the heirs, executors, administrators, successors, and assigns of the Purchaser.

In testimony whereof, the Supplier has hereunto set his hand and affixed his seal, and the Surety has caused these presents to be sealed with his corporate seal duly attested by the signature of his legal representative, this _____ day of _____ 20____.

SIGNED ON _____ on behalf of _____

By _____ in the capacity of _____

In the presence of _____

SIGNED ON _____ on behalf of _____

By _____ in the capacity of _____

In the presence of _____

Advance Payment Security

[Guarantor letterhead or SWIFT identifier code]

Beneficiary: *[Insert name and Address of Purchaser]*

Date: *[Insert date of issue]*

ADVANCE PAYMENT GUARANTEE No.: *[Insert guarantee reference number]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that *[insert name of Supplier, which in the case of a joint venture shall be the name of the joint venture]* (hereinafter called "the Applicant") has entered into Contract No. *[insert reference number of the contract]* dated *[insert date]* with the Beneficiary, for the execution of *[insert name of contract and brief description of Goods and related Services]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum *[insert amount in figures]* () *[insert amount in words]* is to be made against an advance payment guarantee.

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in figures]* (_____) *[insert amount in words]*¹ upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating either that the Applicant:

(a) has used the advance payment for purposes other than toward delivery of Goods;

or

(b) has failed to repay the advance payment in accordance with the Contract conditions, specifying the amount which the Applicant has failed to repay.

A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Beneficiary's bank stating that the advance payment referred to

¹ The Guarantor shall insert an amount representing the amount of the advance payment and denominated either in the currency(ies) of the advance payment as specified in the Contract, or in a freely convertible currency acceptable to the Purchaser.

above has been credited to the Applicant on its account number *[insert number]* at *[insert name and address of Applicant's bank]*.

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Applicant as specified in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate indicating that ninety (90) percent of the Accepted Contract Amount, has been certified for payment, or on the *[insert day]* day of *[insert month]*, *[insert year]*, whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No.758, except that the supporting statement under Article 15(a) is hereby excluded.

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[signature(s)]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

Technical compliance sheet

| Sr.No. | Technical Specification | Compliance Yes/No | Deviation if any | Page no of catalogue or bid document |
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INVITATION FOR BIDS

Notice Inviting Tender (NIT)

BANARAS HINDU UNIVERSITY
VARANASI-221005

e-Procurement Notice

Ref: BHU/SATHI/EQUIP/2019-20/09

Dated: 17/12/2019

Online tenders are hereby invited in two cover system from reputed **manufacturer/ authorized representative of a manufacture/whole sale dealer/importer** for supply of :-

- **Nano Lithography System for 3D Nano and Large Area Opto-electronics device fabrication and Characterization**

Bidders can download complete set of bidding documents from e- procurement Platform <http://eprocure.gov.in/eprocure/app> from 03-01-2020 onwards. Bidders need to submit the bids online for the interested items by uploading all the required documents through <http://eprocure.gov.in/eprocure/app>.

Last Date/ Time for receipt of bids through e-procurement is: 03-02-2020 upto 05:00PM. (Server time). Late bids shall not be accepted.

For further details regarding Tender Notification & Specifications please visit website: <http://eprocure.gov.in/eprocure/app> and www.bhu.ac.in.

CRITICAL DATE SHEET

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|---|------------------------------|
| Published Date | 03-01-2020 (01:00 PM) |
| Bid Document Download Start Date | 03-01-2020 (01:00 PM) |
| Clarification Start Date | 03-01-2020 (01:00 PM) |
| Clarification End Date | 11-01-2020 (05:00 PM) |
| Pre bid meeting | 14-01-2020 (11:00 AM) |
| Bid Submission Start Date | 17-01-2020 (05:00 PM) |
| Bid Document Download End Date | 03-02-2020 (05:00 PM) |
| Bid Submission End Date | 03-02-2020 (05:00 PM) |
| Bid Opening Date | 04-02-2020 (03:00 PM) |

sd/-
Registrar