

INTER-UNIVERSITY ACCELERATOR CENTRE

(An Autonomous Centre of University Grants Commission)

ARUNA ASAF ALI MARG, NEW DELHI-110067, INDIA

NOTICE INVITING TENDER

Tender No: IUAC/NIT/18/DKB/2016-17

Name of Tender: SUPPLY, INSTALLATION AND COMMISSIONING OF SCANNING TRANSMISSION ELECTRON MICROSCOPE (STEM) WITH THERMAL (SCHOTTKY) FIELD EMISSION GUN (FEG).

1	Technical specifications of the Scanning Transmission Electron Microscope (STEM) with Thermal (Schottky) Field Emission Gun (FEG)	As per Annexure-I
2	Required quantity	01 (One)
3	EMD in INR PARTIES REGISTERED WITH NSIC AND FOREIGN PARTIES QUOTING DIRECTLY ARE EXEMPTED FROM PAYING EMD	Rs. 18,00,000/- (Rupees eighteen lakhs only)
4	Cost of tender document	Rs.500/- (Rupees Five hundred in the form of D.D. or Cash. Please attach D.D. of Rs.500/- along with the NIT if the NIT is downloaded from IUAC website)
5	Last Date and Time of Submission of Tender	February 27, 2017, 03:00PM, IST
6	Date & Time for opening of Tender (Technical Bid, Part-I)	February 27, 2017, 03:30PM, IST
7	Date & Time for opening of Tender (Price Bid, Part-II)	The date and time will be intimated to the technically qualified bidders only.
8	Address for submission of Tender	Administrative Officer (S&P), Inter-University Accelerator Centre, Post Box No. 10502, Aruna Asaf Ali Marg, New Delhi -110067
9	Place of the opening of the Tender	Inter-University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi -110067

Note : Cost of Tender document(s) shall be paid in the form of Cash or Account payee Demand Draft/ Bank Pay Order/ Banker's Cheque obtained from any Scheduled Bank drawn in favour of **Inter-University Accelerator Centre** payable at **Delhi**.

THE COST OF TENDER DOCUMENT(S) SHALL NOT BE REFUNDED UNDER ANY CIRCUMSTANCES.

Terms and Conditions

1. Director, Inter-University Accelerator Centre (IUAC), New Delhi invites sealed tenders for **Supply, Installation and Commissioning of Scanning Transmission Electron Microscope (STEM) with Thermal (Schottky) Field Emission Gun (FEG)** from the Manufacturer or their authorized seller only. Tender should be submitted directly by the original manufacturer/supplier or its sole authorized distributor/dealer/Indian Agent. In case of bid by authorized dealer/distributor/Indian Agent, the manufacturer authorization should be attached with the technical bid as per *Annexure -II*.

2. Submission of Tender

Tenders should be submitted in sealed envelopes in two parts separately, i.e. "**Technical Bid**"(Part-I) and "**Price Bid**" (Part-II). The format for submission of Technical bid is at *Annexure-IV* and the format of price bid is at *Annexure-V*. The tender duly filled may be sent to above mentioned address either by post or hand delivered in the **Tender Box** kept in the area near west side entrance of IUAC, after ensuring that due entries are made in the register kept at the counter. It **should not** be handed over to any employee of the centre. **No tender shall be accepted later than the time schedule specified above.**

A. Technical Bid (Part-I): The following criteria/information are essential to qualify the technical bid for the said item:

- (i) Should have satisfactorily completed similar 02-03 supply in last 05 years (at least one of them in a Government organization / department. Purchase Orders / Completion certificates should be submitted for supporting above requirement.

Similar or Similar Nature of work means Supply & Installation of **Scanning Transmission Electron Microscope (STEM) with Thermal (Schottky) Field Emission Gun (FEG)** for any of the following

- a) Government/Autonomous Institutions
- b) Government Research Centres
- c) Universities
- d) Autonomous/Reputed Private Research Centres
- e) Purchase Orders / Completion certificates for supporting above requirements.

- (ii) Confirmation of full technical details as given in *Annexure-1* of the equipment should be submitted for technical evaluation. There must be proper technical information along with the details. Details of control systems for the system along with hardware and software, details with its operational and control devices etc.

- (iii) Required Area for the complete TEM system along with accessories should be mentioned clearly with drawing/schematic layout of the quoted system.
- (iv) Entire copy of Notice Inviting Tender (NIT) should be signed on each page & stamped by the bidder.
- (v) List of Reputed International laboratories having TEM of same model (with address, contact details and year of supply) supplied in last 5 years.
- (vi) List of research Institutes/Laboratories/Centers in India where similar systems are installed successfully.
- (vii) Declaration by the bidder for accepting the General requirements shall be furnished as per Annexure-III.

B. Important Instructions

- (i) Tenders, which are submitted without following the Two-Bid Offer System, will summarily be rejected.
- (ii) The technical offer should be complete to indicate that all products and services asked for are quoted. Each page of the bid and cutting/corrections shall be duly signed and stamped by the bidder. Unsigned Tenders will also be rejected. Failure to comply with this requirement may result in the bid being rejected.
- (iii) Envelope No. 1: Shall contain “Acceptance of Terms & Conditions”, “Technical Bid” and Earnest Money Deposit (EMD). The technical offer should not contain any price information.
- (iv) Envelop No.2: Shall contain price bid only.
- (v) The envelopes must be super-scribes with the following information:
 - Tender Reference Number with name of item
 - Due Date
 - Name of the Vendor
- (vi) The Technical Bid must be submitted in an organized and structured manner. No brochures/leaflets etc. should be submitted in loose form. Please indicate page nos. on your quotation e.g. If the quotation is containing 25 Pages, please indicate as 1/25, 2/25, 3/25 ----- 25/25.
- (vii) Printed conditions of the vendor submitted with the tender will not be binding on Inter University Accelerator Centre, New Delhi.
- (viii) Any bid received by IUAC after the deadline for submission of bids will be rejected and / or returned to the Bidder.
- (ix) No deviation from the stipulated terms and conditions will be allowed. Tenders should be unconditional. Any deviation from the technical specifications and tender condition shall be mentioned in the technical bid separately.
- (x) Duly filled in Technical Bid with proper seal and signature of authorized person on each page of the bid should be submitted and the same should accompany with complete

specifications and drawings, Manufacturer's name, address and relevant Technical Literature/Brochures with warranty Terms and EMD.

- (xi) If the bid is for branded makes, authorization letter from principals clearly indicating that the vendor is the competent authority to sell and provide services towards the items mentioned in the scope of supply given in this tender document.
- (xii) Copy of LST/CST/WCT No. PAN No. and TIN No. allotted by the concerned authorities.
- (xiii) List of deliverable / Bill of materials and services.
- (xiv) Compliance sheet with any deviation with reference to the terms and specifications.
- (xv) Indicate the names of the Indian reputed Organizations where you have supplied similar equipment and may attach the satisfactory performance report of the equipment from user Organization.
- (xvi) The item should be supplied with manuals including technical drawings should be complete in all respects to operate the system without any problem.
- (xvii) Bid documents should be submitted as per the above sequence with Index page and page numbers (including technical literature). Each page of the bid should be signed & stamped in original. Unsigned bids will not be considered for evaluation.

3. Earnest Money Deposit

- (i) The Earnest Money Deposit (EMD) as indicated against the item should be enclosed along with the terms & conditions & technical bid duly signed and stamped in the form of Account Payee Bank Draft payable on any branch of Nationalized/Schedule Bank at Delhi in favor of "Inter-University Accelerator Centre, New Delhi", in a separate sealed envelope. All tenders submitted without requisite amount of earnest money shall be rejected and their technical and financial bids shall not be opened. No interest is payable on EMD.
- (ii) The EMD will be returned to the bidders/Agents whose offer is not accepted by IUAC within one month from the date of the placing of the final order on the selected bidder. In case of the bidder whose offer is accepted, the EMD will be returned on submission of Performance Bank Guarantee (if applicable). However, if the return of EMD is delayed for any reason, no interest /penalty shall be payable to the bidders.
- (iii) Parties registered with NSIC and foreign suppliers quoting directly are exempted from paying EMD. Foreign Bidders quoting directly under original seal and signature (NOT SCANNED) will get the exemption from EMD.
- (iv) The EMD shall be forfeited, if the bidder withdraws the bid during the period of bid validity specified in the tender. In case a successful bidder fails to furnish the Performance Bank Guarantee (if applicable).

4. Amendment to Bid Document

The prospective bidders are required to keep a watch on the IUAC website with regard to any amendment to the tender document or to clarification to the queries raised by the bidders till 7 days prior to the opening of the tender. IUAC reserves the right to reject the bids if the

bids submitted without taking into account these amendments / clarifications. In order to allow prospective bidders reasonable time in which to take the amendment into account in preparing their bids, IUAC, at its discretion, may extend the deadline for the submission of bids.

5. “Price Bid” (Envelope 2)

- (a) In this bid, the bidder is required to quote item’s rates/prices for the supply mentioned in the scope of supply & technical specifications. The rates/price should be inclusive of all machinery cost on FOB nearest port and CIF, New Delhi basis, installation cost and the training. The item wise break up of cost should also be given.
- (b) Price schedule complete in all respects with proper seal and signature of authorized person.
- (c) Tender with any condition including conditional rebate shall be rejected forthwith.
- (d) Cost of all the items should be mentioned clearly and individually in the Price bid (Part-II) only.
- (e) The Bidders are requested to quote for Educational/Institutional Price for Machine/ Equipment since IUAC is an educational research centre.
- (f) Printed conditions of the vendor submitted with the tender will not be binding on IUAC.

6. Correspondence

- (a) Bidders are requested to visit website of IUAC regularly for any clarification / amendment and / or due date extension.
- (b) All the correspondence in respect of tender / contractual obligation shall be made to **Administrative Officer (Stores & Purchase), Inter-University Accelerator Centre, Post Box -10502, Aruna Asaf Ali Marg, New Delhi-110067. E-mail: joseph@iuac.res.in.**

7. Date of opening the Technical Bids

Technical Bids will be opened on February 27, 2017 at 3.30 P.M at office of the Administrative Officer (S&P), Inter-University Accelerator Centre, New Delhi. The Technical bids will be opened in the presence of the bidders on the specified time and date. Bidders/Agents who have responded to the tender only will be allowed to be present.

The bid can be submitted in person or through post/courier (IUAC will not be responsible for delayed / late quotations submitted / sent by Post / Courier etc. resulting in disqualification/ rejection of any bid) so as to reach IUAC on or before the due date and time. Fax / E-mail / Telegraphic / Telex tenders will not be considered. The bidders ‘authorized representative can attend the bid opening.

The technical bids will be evaluated to shortlist the eligible bidders. The price bids of only the short listed bidders shall be considered for further processing. Bidders whose technical offer is found acceptable and meeting the eligibility requirements as specified in this tender will be informed about the date and time of the opening of the commercial bid.

Note: (1) Please do not insert ‘Price Bid’ (prices quoted) in the technical bid envelope. If the price quoted is submitted with technical bid the tender will be rejected.

- (2) No camera mobiles / mobiles are allowed during tender opening.

8. Opening of Price Bids

IUAC will open price bids of only the short listed bidders, in the presence of the bidders or their authorized representatives who choose to attend the price bid opening. The Date and Time of opening the price bid will be intimated only to pre-qualified and technically acceptable Bidders for the item at a later date.

The representatives of short listed firms only will be allowed for price bid opening.

Only technically accepted competitive bids will be considered for placing Purchase Order. The price bid of the vendors whose technical offers are found to be technically deficient or do not meet the qualification criteria as specified in this tender will not be opened.

The supplier should send their techno-commercial representatives for the discussion with the IUAC appointed committee, if required. The representative should be empowered to take financial decision on the spot.

The bidder shall bear all costs associated with the preparation and submission of its bid and IUAC will in no case be responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.

The Director, IUAC reserves the right to accept the offer in full or in parts or reject summarily or partly.

9. Period of validity of bids

Bids shall be valid for a period of 90 days from the date of opening the Technical bid. IUAC may ask for the bidder's consent to extend the period of validity. Such request and the response shall be made in writing only. The bidder is free not to accept such request without forfeiting the EMD. A bidder agreeing to the request for extension will not be permitted to modify his bid.

Bid evaluation will be based on the bid prices without taking into consideration the above corrections.

10. Delivery Period / Timeliness

The time shall be the essence of this contract and entire work as titled above is to be completed in all respects within a period of **6 months** from the date of issue of letter of intent (LOI) /purchase order by the centre. Under the force majeure conditions or delay due to reasons beyond control of the contractor, IUAC may grant suitable time extension for which the contractor has to request along with the justification/ reasons well in advance to the Director, IUAC for approval without any prejudice to price escalation. The decision of the Director, IUAC will be final and binding on the bidder/contractor. Any further delay after sanctioned extension in completing the work for reasons attributable to the Contractor is liable for liquidated damages as per clause 24 of NIT.

11. Locations for the Supply / Services

The Laboratory Equipment covered by this document is required to be supplied and installed at IUAC, New Delhi.

12. Inspection

- a. The inspection of the system will be done by our technical expert /Scientist in the presence of firm's representative.
- b. In case of receipt of the material in short supply or damaged condition the supplier will have to arrange the supplies/ replacement of goods free of cost pending the settlement of the insurance case wherever applicable on FOB Or CIF, New Delhi basis till satisfactory installation of the system.

13. Payment Terms

Payment will be through letter of credit. 90% against shipment documents of equipment and 10% against installation and acceptance test of equipment (payment terms are negotiable). The tenderer who are not agreeing to above payment terms are requested not to submit their tender otherwise their EMD will be forfeited.

IUAC will not provide any accommodation/transportation for the engineers/ representatives for attending installation, commissioning and demonstration work. It is the absolute responsibility of the Principal Supplier/Indian Agent to make their own arrangements.

The successful bidder, on award of contract / order, must send the contract / order acceptance in writing, within 7 days of award of contract / order failing which the EMD will be forfeited.

14. Award of Contract

IUAC shall award the contract to the eligible bidder whose bid has been determined as the lowest evaluated price bid. IUAC reserves the right at the time of award of Contract to increase or decrease the quantity of items specified in the Schedule of Requirements without any change in price or other terms and conditions.

15. Performance Bank Guarantee:

Within ten (10) days of the award of contract, the vendor shall furnish a Performance Bank Guarantee amounting to 10% of the purchase order value in the form of Bank Guarantee favoring the Director, Inter University Accelerator Centre, New Delhi valid till completion of warranty period.

16. Corrupt or Fraudulent Practices

IUAC requires that the bidders who wish to bid for this project have highest standards of ethics. IUAC will reject a bid if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices while competing for this contract. IUAC may declare a vendor ineligible, either indefinitely or for a stated duration, to be awarded a contract if it at any time determines that the vendor has engaged in corrupt and fraudulent practices during the execution of contract.

17. Interpretation of the clauses in the Tender Document / Contract Document

In case of any ambiguity / dispute in the interpretation of any of the clauses in this Tender Document, the decision of Director, IUAC shall be final and binding on all parties.

18. Price

The price quoted shall be considered firm and no price escalation will be permitted at any time. The quotation should be in Indian Rupees or any known foreign currency. Packing, forwarding, freight, insurance and commissioning charges, if any extra may be quoted separately in Commercial Bid.

In case of INR bids the price criteria should be on F.O.R., IUAC, New Delhi. Govt. Levies like central excise duty, sales tax, octroi, WCT etc., if any, shall be paid at actual rates applicable on the date of delivery. Rates should be quoted accordingly giving the basic price, Central Excise Duty, VAT/ Central Sales Tax etc., if any. Please note that IUAC is exempted from payment of Excise duty vide Govt. Notification No.10/97 Central Excise dated 01/03/1997. No sales tax exemption form will be provided by IUAC.

Please provide TIN no. of the firm along with the CST/WCT No. allotted by the concerned authorities in your quotation.

In case of Foreign Currency bid: - Price criteria should be FOB nearest port and Cost, Insurance and Freight (CIF) up to New Delhi is required.

19. Pre-installation

Pre-installation facilities required for installation may please be intimated in the technical bid. Subsequently, before the consignment lands in IUAC, New Delhi the bidder shall confirm that the pre-installation requirements are sufficient for installation of the equipment's. In other words the bidder should continuously monitor the pre-installation requirements and see that everything is ready before the consignment is taken to the site for installation.

20. Installation, Warranty & Support

- a) Bidder shall be responsible for installation / demonstration wherever applicable and for after sales service during the warranty and thereafter.
- b) The entire equipment and its accessories (such as EDS, STEM-HAADF detectors, vacuum pumps, computers, printer, EELS etc.) must have warranty for the period of **1 year free of cost** from the date of installation and commissioning including warranty on FE gun/ emitter.
- c) This should include all attachments used from third party.
- d) Warranty shall include free maintenance of the whole equipment supplied including free replacement of parts. The defects, if any, shall be attended to on immediate basis but in no case any defect should prolong for more than 48 hours. The comprehensive warranty includes on-site warranty with parts.
- e) The defects, if any, during the guarantee/warranty period are to be rectified free of charge by arranging free replacement wherever necessary. This includes cost, insurance, freight, custom duty, octroi, local taxes if any should be borne by the beneficiary or his agent. A clear confirmation should be given for this item.
- f) SF6 gas, if needed, for high tension and emission chamber should also be provided by supplier during warranty.
- g) The bidder shall assure the supply of spare parts after warranty is over for maintenance of the equipment supplied if and when required for a period of 10 years from the date of supply of equipment on payment on approved price list basis.
- h) Microscope Software: Full software package for TEM control, data acquisition, analysis and display. Supplier has to provide upgraded software free

of cost, irrespective of software platform, as and when it is upgraded within 10 years of microscope supply.

- i) The equipment must be supported by a Service Centre manned by the principal vendor's technical support engineers. The support through this Centre must be available 24 hours in a day, seven days a week and 365 days a year. Also it should be possible to contract the Principal's vendor support Centre on a toll free number/web/mail.
- j) The vendor will have to arrange for all the testing equipment & tools required for installation, testing & maintenance etc.

21. Indemnity

The vendor shall indemnify, protect and save IUAC against all claims, losses, costs, damages, expenses, action suits and other proceeding, resulting from infringement of any law pertaining to patent, trademarks, copyrights etc. or such other statutory infringements in respect of all the equipment's supplied by him.

The successful bidder will be fully responsible for payment of wages and other dues as prescribed and compliance of various Labour Laws.

The successful bidder should give an undertaking that the staff deployed at the centre in terms of this contract at all time will be employees of the agency exclusively and they shall not be entitled to any claim of employment or permanency of job with IUAC.

IUAC reserves the right to forfeit whole or part of the security money towards any damage/loss caused due to the negligence on the part of the agency engaged.

22. Insurance

The equipment is to be supplied will be insured by the vendor against all risks of loss or damage from the date of shipment till such time it is delivered at IUAC site in case of Rupee/Foreign currency transaction.

23. Force Majeure

The Supplier shall not be liable for forfeiture of its performance bank guarantee, liquidated damages or termination for default, if and to the extent that, it's delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure. For purposes of this Clause, "Force Majeure" means an event beyond the control of the Supplier and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but are not limited to, acts of the Purchaser either in its sovereign or contractual capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.

If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such conditions 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 practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

24. Penalty clause for late delivery & late installation

- a. Subject to operation of Force Majeure, time for delivery and acceptance is the essence of this contract. The supplier shall arrange to ship the ordered materials within the delivery period mentioned in the purchase order unless extended with/without penalty.

- b. A penalty @ 0.5% per week of order value will be charged for delayed project period, subject to a maximum of 5% of order value.
- c. If the delay in the shipment of the ordered materials attributable to the supplier exceeds agreed time period from the date of original agreed upon date of shipment and extended with/without penalty, the IUAC, New Delhi shall have the right to cancel the contract/purchase order and recover the liquidated damages from other dues of the party or by legal means. It will also affect the other/future business dealings with such suppliers.

25. Dispute Settlement

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. If, after twenty-one (21) days, 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 commence arbitration, as hereinafter provided, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given. Any dispute or difference in respect of which a notice of intention to commence arbitration has been given in accordance with this Clause shall be finally settled by arbitration. Arbitration may be commenced prior to or after delivery of the Goods under the Contract.

The dispute settlement mechanism/arbitration proceedings shall be concluded as under:-

- (i) In case of Dispute or difference arising between the Purchaser and a domestic supplier relating to any matter arising out of or connected with this agreement, such disputes or difference shall be settled in accordance with the Indian Arbitration & Conciliation Act, 1996, the rules there under and any statutory modifications or re-enactments thereof shall apply to the arbitration proceedings. The dispute shall be referred to the Director, Inter University Accelerator Centre and if he is unable to unwilling to act, to the sole arbitration of some other person appointed by his willing to act as such Arbitrator. The award of the arbitrator so appointed shall be final, conclusive and binding on all parties to this order.
- (ii) In the case of a dispute between the Purchase and a Foreign supplier, the dispute shall be settled by arbitration in accordance with provision of sub-clause (a) above. But if this is not acceptable to the supplier then the dispute shall be settled in accordance with provisions of UNCITRAL (United Nations Commission on International Trade Law) Arbitration Rules.
- (iii) The venue of the arbitration shall be the place from where the purchase order or contract is issued.

Notwithstanding any reference to arbitration herein,

- (a) The parties shall continue to perform their respective obligations under the contract unless they otherwise agree; and
- (b) The purchaser shall pay the Supplier any monies due the Supplier.

Annexure-I

REQUIREMENT SPECIFICATIONS

1. SCOPE OF TENDER

This tender includes the supply, delivery, installation and commissioning of one unit of **Scanning Transmission Electron Microscope (STEM) with Thermal (Schottky) Field Emission Gun (FEG)** for Inter-University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi - 110067 INDIA.

2. TECHNICAL SPECIFICATIONS

General Description

This tender includes the supply and installation of a **Scanning Transmission Electron Microscope (STEM) with Thermal (Schottky) Field Emission Gun (FEG)** and capable of the following functions:

- a. Conventional transmission imaging modes
- b. Selected Area Electron Diffraction
- c. Convergent Beam Electron Diffraction (CBED)
- d. Nano-beam electron diffraction
- e. Energy Dispersive X-ray Spectrometry
- f. Digital Imaging
- g. Imaging Filter

The microscope must be fully self-contained with all necessary support systems such as vacuum systems, cooling systems, high tension power supply system, computer hardware and software. The microscope should be controlled by a central microprocessor. Its operation must be by personal computer with suitable software. The software should operate under Microsoft Windows latest version operating system.

At 200kV the lattice and point resolution of the TEM should be 0.12nm or better and 0.25nm or better respectively. The STEM-HAADF image resolution should be 0.19nm or better. The magnification range of the TEM should be at least cover from 50x to 1.5Mx or better, while the magnification range of the STEM should be at least cover from 150x to 100Mx or better. Thermal Schottky Field Emission Gun (FEG) with probe current ≥ 0.5 nA @ 1nm diameter spot size or better at 200 keV. With EDS detector as windowless Silicon Drift Detector (SDD) having total active area of 100 mm² or more and solid angle of 0.90 steradians or more.

Technical specifications

S. No	Specifications
1	Basic configuration
	<p>Acceleration voltage = 20KV- 200 KV (variable either in steps or continuously), alignment should be on at least 20KV, 60KV, 80KV, 120KV, 160KV, 200KV</p> <ul style="list-style-type: none"> • Energy spread $\leq 0.8\text{eV}$ • HV change should be quick and with auto alignment • Lens configuration should be fully compatible with all the standard and optional specifications.
	<p>Electron Source Field Emission Gun:</p> <ul style="list-style-type: none"> • Thermal Schottky Field Emission Gun (FEG) type • Brightness: $4 \times 10^8 \text{ A/cm}^2/\text{sr}$ or more • Probe current 0.5 nA or more @ 1nm spot size at 200kV • A beam stopper facility should be included
2	Magnification & Resolution
	<p>Magnification: TEM should be at least cover from 50x to 1.5Mx or better STEM should be at least cover from 150x to 100Mx or better</p>
	<p>Lattice resolution: 0.12 nm or better Point to Point Resolution= 0.25 nm or better STEM-Dark Field image resolution should be 0.19nm or better</p>
3	Lens System
	<p>System consisting of</p> <ul style="list-style-type: none"> • Condenser lens • Objective lens. • Diffraction lens • Intermediate and Projector lens • Lorentz lens (Optional)
4	Specimen chamber
	<p>Eucentric Goniometer fully motorized stage with all 5 axis (XYZ$\alpha\beta$) with accurate specimen position recall and retrieve facility with accuracy in position $<0.05\text{nm}$</p> <ul style="list-style-type: none"> • TEM stage should be stable with drift $\leq 1.0 \text{ nm/min}$. • Tilt angle $\alpha\beta$ of at least $\pm 30 \text{ deg.}$ in all X, Y of the sample holder. • Specimen movement X, Y and Z and tilt must be motor driven and linked with magnification. • Maximum travel in the X and Y directions must be at least 2 mm. Maximum travel in Z direction must be at least 0.40 mm. • In order to improve the accuracy of stage movement, a piezo control stage movement is preferred. The peizo controller should be able to provide a minimum step of 0.04nm or better. • Specimen insertion must be through an automatic/manual airlock system. The exchange chamber must be evacuated by an automatic pumping system to eliminate contamination of specimen chamber from surrounding. • There should be bake-out heater built-in for the specimen stage & complete column. • An anti-contamination device should be provided around the specimen stage. • A goniometer cover for the specimen holder should be provided, The goniometer cover

	should be able to provide isolation to the TEM specimens from noise and pressure change in the TEM room.
5	Specimen holders:
	<ul style="list-style-type: none"> • Single tilt holder (one no.) (Standard) • Double tilt holders (one no.) (Standard) • Low background holder for EDS analysis of low Z elements with double tilt. (one no.) (Standard) • Multiple specimen holder for accommodating 3 or more grids. (Standard) • Heating holder (up to 750 °C)(with supportive power supply and complete hardware other accessories). Tilt angle to be specified if not complying with standard tilt angle of ± 30 deg.. (one no.) (Optional) • High-tilt specimen holder for tomography (maximum tilt (X & Y) $\geq \pm 70$deg). (Optional)
6	Vacuum system
	Vacuum should be suitable for FEG and EDS analysis. Oil free pumps should be used for the complete vacuum system. Fully automatic differential pumping system preferentially with turbo molecular (TMP) and ion pumps.
7	Imaging System
	<ul style="list-style-type: none"> • Different modes of operation of the lenses must be controlled by an internal microprocessor. • Rotation-free and distortion-free image is essential during magnification change.
8	Diffraction System
	<ul style="list-style-type: none"> • Selected Area Electron Diffraction must be possible from low to mid-range magnification. • The change over from bright field to centered dark field imaging and vice versa should be through a single button selection. • Convergent Beam Electron Diffraction (CBED). • Nano-beam electron diffraction. • A selector for different convergent beam diffraction angle (α angle) must be built-in as standard.
9	Viewing Chamber
	<ul style="list-style-type: none"> • The measured electron beam current density should be digitally displayed.
10	Operation
	<ul style="list-style-type: none"> • Microscope should be operated remotely. • Microscope/STEM alignment procedure should be user-friendly and storable/recalled. • User interface control or push-button action must be capable of changing controls for changing the setting from one to another without need of a service engineer and without the need to switch off high tension/microscope. • All software including latest version of Microsoft windows should be used to operate the instrument, acquire and process the data should be based on 64 bit platform. • An extra license of all software should be provided for off line analysis. • The main system as well as other accessories should run on 220V, 50 Hz single phase AC power supply. • The complete sets of manuals in English with line diagrams/electronic circuits/instruc-

	<p>tions for maintenance/operation of TEM/accessories should be provided.</p> <p>Operation mode: TEM, STEM(BF, DF, HAADF), EDS, Diffraction. Lorentz imaging mode. (Optional) Secondary or back scattered electron imaging (Optional) 3D tomography (Optional)</p>
11	<p>Scanning Transmission Electron Microscope (STEM) Image Acquisition Unit</p> <ul style="list-style-type: none"> • A STEM system should be included as standard. The STEM system should be fully integrated into the basic operation of the TEM. It should be controlled by the same PC system of the TEM. • Bright Field(BF), Annular dark field and z-contrast modes. • Detectors must be available for STEM Bright-Field, STEM-HAADF. It should be possible to display live STEM images simultaneously. • BF and HAADF detector supported with software for data acquisition and analysis. • Drift Corrected Image function option should be available. Images should be distortion free. • Ronchigram mode in STEM mode should be available. • Lorentz imaging mode for imaging of magnetic sample. (Optional) • Secondary or Back Scattered imaging. (Optional)
12	<p>Energy Dispersive Spectroscopy (EDS)</p> <ul style="list-style-type: none"> • A microanalytical system that is attached to the microscope for energy dispersive micro-analysis should be quoted as standard. • The operation console of the microanalytical system must be integrated with the computer system of the TEM seamlessly. All operation conditions of the TEM such as acceleration voltage, magnification etc. should be read by the EDS system immediately, so that analytical conditions can be optimized easily. <p>Detection:</p> <ul style="list-style-type: none"> • Windowless Silicon Drift Detector (SDD). • Total active area should be 100 mm² or more. • EDX solid angle should be of 0.90 steradians or more. • It should capable of typical high count rates in the TEM column • The safeguard for the detectors, suitable in the event of vacuum failure during the specimen holder loading or due to any other cause, should be provided. • All the detectors to be simultaneously installed into the microscope column (in-column). <p>Detection range: from Boron – Uranium</p> <ul style="list-style-type: none"> • Detector should be windowless to increase the sensitivity for light elements. <p>Detector resolution: At Mn-Kα: FWHM \leq136 eV @ 10,000 counts/s or better.</p> <ul style="list-style-type: none"> • EDS analysis capable of doing in all specimen tilt. (explain how the detector configuration to meet this requirement) • Detector cooling (Peltier). • Software for qualitative and quantitative elemental analysis, X ray mapping, capability for Spectrum analysis, Digital control of the beam for compositional profile. Phase mapping, Peak deconvolution, Element to phase map and phase to element map. <p>3D Tomography (Optional) Drift correction/reconstruction facility (for 3D visualization), Most versatile state of the art software and hardware to be quoted. 3D Tomography complete package to be quoted separately.</p>

13	Data recording systems
	<ul style="list-style-type: none"> • High Resolution retractable and fully EELS compatible CMOS camera with minimum 4k x 4k pixel full frame CMOS with near 100 % fill factor at full sensor readout speed at the rate of 25f- ps/sec or more in image mode. • Camera with all necessary hardware and software for image analysis and pseudo coloring, dif- fraction study and d-spacing analysis and particle size analysis. • Future upgradable to ‘video’ mode with all necessary hardware and software. • Camera should be useable at 80 to 200keV and more. • During TEM operation, the scintillator and camera system must be in the microscope vacuum. It must be able to retract automatically into its own sealed enclosure when EELS analysis is carried out. • The scintillator and the camera head must be cooled by an appropriate cooling system. The supplier is to ensure adequate cooling capacity is provided for. • Upgrade to ‘video’ mode with all necessary hardware and software. (Optional)
14	Secondary or Backscattered electron image detector may be quoted separately. (optional)
15	Post column EELS (optional)
	<ul style="list-style-type: none"> • Zero loss peak and EELS peaks should be recorded simultaneously. • FWHM of zero loss peak should be 0.8 eV or better. • The elemental mapping of chosen area can be done by EELS. • STEM-EELS spectrum read out speed: Not less than 100 number of EELS spectra per sec. • EELS resolution with 1s and Ti-L edge to be specified.
16	Calibration standard
	<p>(a) Magnification calibration. (b) Resolution calibration. (c) EDS (d) One set of all standard samples for alignment of TEM (HR/SAD/EDS etc).</p> <p>These standards should be supplied from ISO certified suppliers with accuracy/traceability etc. certificates. Calibration certificate should be provided from ISO 17025 accredited lab. or NMI.</p>
17	Software
	<ul style="list-style-type: none"> • Microscope Software: Full software package for TEM control, data ac- quisition, analysis and display. Supplier has to provide upgraged soft- ware free of cost, irrespective of software platform, as and when it is upgraded within 10 years of microscope supply. • Should be capable of image processing. • Should be capable of selected area electron diffraction (SAED) analy- sis. • For qualitative and quantitative elemental analysis, EDX-ray elemen- tal mapping. • Capability for spectrum analysis, • Digital control of the beam for composition profile. • Phase mapping. • Peak deconvolution in EDX spectrum. • Element to phase map and phase to element map. • Drift correction facility. • Most versatile and state of the art software to be quoted.

	<ul style="list-style-type: none"> • At least one future software upgrade/version should be provided free of cost. • 3D Tomography (optional).
18	Cooling system
	An efficient automatic temperature controlled closed circuit water cooling system required for the microscope/accessories. Imported cooling system and compressor should be supplied by TEM supplier.
19	Installation and Commissioning
	<ul style="list-style-type: none"> • Prior to the supply, the vendor should inspect the site, perform the site-inspection scientifically for electromagnetic fields and mechanical vibrations and suggest the installation related civil works, if any, required. • The company must guarantee the performance of the system based on acoustic and temperature fluctuation specification of the TEM. The company must be able to work on room construction with full understanding of correlation between TEM function and its specification and temperature stability and its drift of the room. • Vendor to arrange for installation. IUAC will provide empty laboratory with electrical points and air conditioning and earthing (<100ohm resistance). All the other infrastructural facilities to run the facility viz. water chiller etc. have to be provided by the vendor. Installation of all the units as specified in the tender documents (e.g. 200 kV TEM, EDX, HAADF etc.) should be completed by qualified experts from the manufacturer end and not by their representative within 30 days of arrival of the equipment at IUAC. During installation those experts will also train designated IUAC personnel. • The manufacturer should undertake to install and commission the equipment and all attachments and accessories and also demonstrate the performance guaranteed as per specifications at site. • If required for installation the price of vibration isolation platform must be quoted. • Two computers (screen size= 32inches; one for operation and other for analysis), working table, compatible high quality colour laser printer for colour printing. • The computers should be loaded with integrated software for microscope/EDS/STEM/Camera control, operation, data acquisition. • One standby computer loaded with all necessary software and hardware for operation to be provided. • Vendor to ensure that all bought out items like EDS, Camera etc. to be installed by the respective engineers.
20	ACCEPTANCE TESTS
	<ol style="list-style-type: none"> 1) Beam drift $\leq 1.0\text{nm}/\text{min}$ 2) Specimen drift $\leq 1.0\text{nm}/\text{min}$ 3) TEM Lattice resolution $\leq 0.12\text{nm}$ 4) TEM Point to Point Resolution $\leq 0.25\text{nm}$ 5) STEM Dark Field Image Resolution $\leq 0.19\text{nm}$ (to be demonstrated using sample of suitable crystal structure) 6) EDS Resolution $\leq 136\text{keV FWHM}$ at Mn K-alpha peak. 7) Probe current $\geq 0.5\text{ nA}$ @ 1nm diameter spot size or better at 200 keV. 8) Nano-beam electron diffraction.
21	Spare parts
	<ul style="list-style-type: none"> • Assurance about spares availability for 10 years should be provided. This should include spare parts related to third party attachments

	<p>connected to the main machine.</p> <ul style="list-style-type: none"> • Recommended set of spares and consumables for five years of operation may be quoted as optional items. • List of essential spares for at least one year to be provided.
22	Comprehensive Warranty
	<ul style="list-style-type: none"> • The entire equipment and its accessories (such as EDS, STEM-HAADF detectors, vacuum pumps, computers, printer, EELS etc.) must have warranty for the period of 1 year free of cost from the date of installation and commissioning including warranty on FE gun/ emitter. • This should include all attachments used from third party. • Warranty shall include free maintenance of the whole equipment supplied including free replacement of parts. The defects, if any, shall be attended to on immediate basis but in no case any defect should prolong for more than 48 hours. The comprehensive warranty includes onsite warranty with parts. • The defects, if any, during the guarantee/warranty period are to be rectified free of charge by arranging free replacement wherever necessary. This includes cost, insurance, freight, custom duty, octroi, local taxes if any should be borne by the beneficiary or his agent. A clear confirmation should be given for this item. • SF6 gas, if needed, for high tension and emission chamber should also be provided by supplier during warranty.
23	Manpower
	<ul style="list-style-type: none"> • Manpower for TEM operation to be quoted per year for a period of 3 years from the date of installation.
24	Training
	<p><u>On-site training:</u> On-site training to be provided covering the different topics of microscope operation (microscope's alignment, STEM alignments, specimen loading, microscope's operation for recording BF/DF/HAADF images, SAD/CBED pattern recording, EDS/ data acquisition, hardware/software interfaces, familiarization with all software, specimen holders, etc.) and basic maintenance.</p> <ul style="list-style-type: none"> • Two week training at the time of installation • One week workshop by an application specialist. • Two week training with specimen handling after two months of installation. • Two weeks training after six months of installation. <p>The entire expenses for these trainings should be borne by the supplier.</p> <p><u>Training at the manufacturer site:</u> Further one week interactive training at the manufacturer site for one IUAC personnel to familiarize with the latest developments in the area of advance usage of Analytical Transmission Electron Microscopy and to another IUAC personnel on normal and advanced operations and maintenance of the instrument.</p> <p>The entire expenses for training at the manufacturer site will be borne by IUAC.</p>
25	Compliance statement
	<p>Compliance statement to each item of this document to be provided along with technical bid. Actual values of the technical parameters e.g. energy spread, resolutions, magnifications, stability etc. are to be mentioned along with the compliance statement.</p>

To

The Director

IUAC, New Delhi -110067

Sub: Manufacturers' Authorization form against Tender. No: _____

We _____ (Name of the Manufacturer) who are original manufacturers of _____ (Type of goods manufactured) having factories at _____ (full address of Manufacturer's factories) do hereby authorize _____ (Name of the Bidder) to submit a bid against your Tender No. _____ for the _____ Goods manufactured by us and to subsequently negotiate and sign the contract.

We hereby extend our full guarantee and warranty with respect to the Goods offered by the above firm.

Manufacturer's Name:

Signature of Authorized representative of the Manufacturer:

Duly authorized to sign this Authorization on behalf of :

_____ (Name of the Bidder)

Date:

Note : In case the bidder not doing business within India, shall furnish the certificate to the effect that the bidder is or will be represented by an agent in India equipped and able to carry out the supply, maintenance, repair obligations etc., during the warranty and post warranty period or ensure a mechanism at place for carrying out the supply, maintenance, repair obligations etc., during the warranty and post- warranty period.

Declaration

Additional General Requirements:

1. Name and address of vendor :.....
2. Model of TEM offered :.....
3. Principal and country of origin :.....
4. Compliance statement to each item of Technical Specification to be provided along with technical bid. **Actual values of the technical parameters** e.g. energy spread, resolutions, magnifications, stability etc. are to be mentioned along with the compliance statement.
5. Delivery time must not be greater than 6 months from the date of issue of Purchase Order.
6. Warranty (As per section 26).
7. Assured Supply of spares for at least 10 years from the date of installation and commissioning. (As per section 26)
8. Supplier must provide information of “successfully executed installation and testing of same instrument”, in at least 3 different research labs, outside the country of manufacture of the instrument.
9. The supplier should provide list of users (of particular equipment model being offered) in India, their complete name, address, telephone numbers and contact persons etc. It is obligatory for the supplier to demonstrate the complete working of the equipment being offered at one of the Users site.
10. No. of trained engineers at Delhi :.....
11. Response time to attend any breakdown (desirable: within 48 hours)
12. Average time to rectify the problem (desirable: within 5 working days)
13. Installation preparatory works like site testing, necessary electrical and civil works (if any) have to be undertaken by the vendor.

14. Vendor to arrange for installation. IUAC will provide empty laboratory with electrical points and air conditioning. All the other infrastructural facilities to run the facility viz. water chilling plant etc. have to be provided by the vendor. Installation of all the units as specified In the tender documents (e.g. 200kV TEM, EDX, HAADF etc.) should be completed by qualified experts from the manufacturer end and not by their representative within 30 days of arrival of the equipment at IUAC. During installation those experts will also train designated IUAC personnel.
15. Installation certificate will be signed after satisfactory observation of the performance of the system as per the ACCEPTANCE TESTS after complete installation.
16. Upgrade of software free of cost, irrespective of software platform, as and when it is upgraded within 10 years of microscope supply. (As per section 26)
17. All necessary documents including operation manuals of TEM and attachments, accessories, chiller, specified in the Tender have to be supplied in printed and soft version.
18. Full service manuals with complete circuit diagrams and circuit descriptions to be supplied both as hard copy and CDs, along with diagnostic tools including interface cards and software, plus any specialized mechanical tools required for instrument servicing or repairing.
19. Warranty for the TEM, cooling system and peripherals should be provided. This warranty will include the free of cost/all expenses paid delivery of any/all spare parts as may be required for trouble free operation of the equipment. Any charges related to site visits of Indian representative and/or the foreign principal's experts for any such maintenance jobs during the warranty period will have to be borne by the supplier.
20. Dealership/Authorization certificate from the manufacturer must be attached.
21. IF ANY OTHER ITEMS/FEATURES NOT COVERED IN THE ABOVE SPECIFICATIONS AND ARE LIKELY TO BE REQUIRED MUST BE QUOTED ALONG WITH SUPPORTING LITERATURE.

Accepted

(Signature of bidder)

Note:- Entire NIT (except price bid PART -II) is to be attached with "Technical bid (Part-I)" duly signed & stamped by the bidder.

INTER-UNIVERSITY ACCELERATOR CENTER,

NEW DELHI

Technical Bid Form (Part-I)

1. Name of the Company
2. Full Address of Company along with
Telephone No :
Fax No. :
E-mail Address :
3. Local address of company for communication, if any.
4. Are you a manufacturer or dealer/reseller.
- 5 (a). Supply & Installation of TEM equivalent to our tendered of last 3 financial years in State Government or Govt. of India Department(s) /Reputed Organization(s) (in Nos. and Value) .

(Please attach list of clients)

(i) Year 2013-2014

(ii) Year 2014-2015

(iii) Year 2015-2016
- 5 (b). Trade Tax / Sales Tax Registration no. with Place
- 5 (c). Income Tax Registration no. with place.

Signature of bidder with

Company stamp

