National Institute of Food Technology Entrepreneurship and Management
Plot 97, Sector 56, HSIIDC Industrial Estate, Kundli, Distt-Sonipat, Hatyana
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CORRIGENDUM/ADDENDUM

Tender No. N/BA/D/2021/2/14 for the ONLINE TENDER FOR procurement of Field Emission Scanning Electron Microscope for CATR-FNB

Reference: 1) Date of Issue of Tender Document: 07.07.2021

2) Date of Pre-bid Meeting : 14.07.2021

Please refer the pre-bid meeting held on above cited date for the procurement of above equipments.

On the recommendation of User as well as Technical Evaluation Committee, the following corrigendum/addendum is proposed as under:

Clause No.	Present Para/Specification	Proposal Corrigendum/Addendum (to be read)
Revised specification is enclosed.		

Critical Date Sheet

Last Date & Time of bid submission	05.08.2021, 02.00 PM
Date & time of Technical bid opening	06.08.2021, 03.00 PM

The said tender may be read amended to this extent. The other terms & condition of tender are remain unchanged.

29/7/21

Officer I/c Purchase

Specifications for versatile FESEM

The offered **FE-SEM** should be offered along with EDS and STEM. The FE-SEM equipment should be computer-controlled with all the required hardware, software, accessories, standards, and other consumables required for installation and commissioning.

The Technical Specification & Terms and conditions:

The system should be able to record the image with high-resolution (at nanometer scale level) all kinds of food samples *(Liquid, Solid and Semi Solid) in their natural state with minimum sample preparation along with nanomaterials samples* inorganic oxides/sulfides/halides, polymer, ceramics, semiconductors, insulating, magnetic or magnetizable materials) with charge-free imaging & analysis of conductive / nonconductive and hydrated samples.

Manufacturers must give a certificate on the **Model** and the **Year** of the manufacturing. Compatible spares must be available for another **10 years**. A minimum of **10 FE-SEM** installations should be available in India preferably in last 5 years. The system should be of the latest technology and globally listed product.

FESEM should be able to perform at high vacuum and variable pressures to provide flexibility by accommodating the widest range of samples of any SEM available, including samples that are outgassing or otherwise not vacuum compatible.

Essential Specifications

S.no	Criteria	Present Specifications	Modifications in Specifications	Corrigendum

CORRIGENDUM-1

1	Resolution at High vacuum mode Resolution at Variable Pressure	1.0 nm @ 15 kV (SE) or better 2.0 nm @ 1 kV (SE) or better 2.5 nm @ 30 kV / 15 kV (BSE) or better 1.0 @ 30 kV (STEM) or better	Resolution **0.7nm@ 15 kV or better** Companies should quote all relevant models with respect to the resolution.	**0.7nm@ 15 kV or better** **2.0 nm** @ 1 kV (SE) or better **0.7nm** @ 30 kV (STEM) or better **Companies should quote all relevant models with respect to the resolution.**
2		2.0 nm @ 30KV (SE) or better	-	2.0 nm @ 30KV (SE) or better
3		~~All resolution values to be achieved without any sample or stage biasing~~	**All resolution values claimed should be supported by pre-published documents.**	**All resolution values claimed should be supported with pre-published documents.**
4	Electron Gun	High brightness field emission electron source Schottky (FEG) should be offered. Automatic Emitter for the safety-controlled run-up to the target emitter conditions.	-	High brightness field emission electron source Schottky (FEG) should be offered. Automatic Emitter for the safety-controlled run-up to the target emitter conditions.

CORRIGENDUM-1

5	Electron beam parameters:	• Beam current range: few pA to 100 nA or more Current stability to be better that 0.2% per hour • Accelerating voltage range: 20V – 30 kV, variable in 10 volts steps • Magnification: ~~×~~ 25x or less to 1,000,000× or higher • Auto focus-automatic fine focus control. • Auto wobble-automatic assistance in aperture alignment with adjustable amplitude and speed. Beam deceleration/Gentle beam mode/ Tandem decal mode / BDT /Beam Booster technology for High Resolution imaging at lower kVs preferably below 2kV.	Beam current Range: Minimum: 3pA or lower Maximum: 100 nA or higher Provision for measurement of probe current with minimum resolution of 1pA. Magnification changed to **30x** or less to 1,000,000× or higher	Beam current Range: **Minimum: 3pA or lower** **Maximum: 100 nA or higher** **Provision for measurement of probe current with minimum resolution of 1pA.** Accelerating voltage range: 20V – 30 kV, variable in 10 volts steps • Magnification: ~~×~~**30x** or less to 1,000,000× or higher • Auto focus facility and fine focus control. • Auto wobble-automatic assistance in aperture alignment with adjustable amplitude and speed. Beam deceleration/Gentle beam mode/ Tandem decal mode / BDT /Beam Booster technology for High Resolution imaging at lower kVs preferably below 2kV.
6	Chamber Size	• Large chamber size, Chamber dimensions of 300 mm or better inner diameter and 270 mm or better height. • Ports: 10 or more to support STEM and other additional accessories in future. • EDS take-off angle: 35°	**Large chamber size is required for upgradation in future.** **Ports : 7 or more**	**Large chamber size is required for upgradation in future.** Chamber dimensions of 300 mm or better inner diameter and 270 mm or better height. • **Ports: 7 or more** to support STEM and other additional accessories in future. • EDS take-off angle: 35°

CORRIGENDUM-1

7	Stage	5-axes motorized XY - 100 mm × 100 mm or more Motorized Z 50 mm or more Rotation n × 360° Tilt -4° / +70° or better Stage should be fully Eucentric or Compucentric Single-frame or 4-view image display During cross-sectional imaging with stage tilt astigmatism, wobbling, aberration correction etc. should be controllable with proper adjustment of focusing at both low and high kVs. It is also mandatory while tilting the sample from perpendicular position with respect to beam, the imaging parameters should not get changed for any predefined magnification. Multi Specimen Sample Holder (Min 9 holding capacity) should be supplied.	-	5-axes motorized XY - 100 mm × 100 mm or more Motorized Z 50 mm or more Rotation n × 360° Tilt -4° / +70° or better Stage should be fully Eucentric only Single-frame or 4-view image display During cross-sectional imaging with stage tilt astigmatism, wobbling, aberration correction etc. should be controllable with proper adjustment of focusing at both low and high kV. It is also mandatory while tilting the sample from perpendicular position with respect to beam, the imaging parameters should not get changed for any predefined magnification. Multi Specimen Sample Holder (**Min 7 or more**-holding capacity) should be supplied.
8	Anti-Contamination Device	Integrated plasma cleaner to be provided	-	Integrated plasma cleaner or any better to be provided
9	Detectors	FESEM should detect up to four signals simultaneously from any combination of the available detectors or detector segments:	-	FESEM should detect up to four signals simultaneously from any combination of the available detectors or detector segments:

10		Essential Detectors • Chamber SE detector. • In-Lens SE detector/In column detector or equivalent detector for high resolution imaging in High Vacuum.• Low-vacuum SE detector (LVD) • IR camera for viewing sample in chamber • Retractable or lens-mounted segmented under-the lens Directional Back Scatter detector • Lens-mounted analytical detector	-	Essential Detectors • Chamber SE detector. • In-Lens SE detector/In column detector or equivalent detector for high resolution imaging in High Vacuum.• Low-vacuum SE detector (LVD) • IR camera for viewing sample in chamber • Retractable or lens-mounted segmented under-the lens Directional Back Scatter detector Lens-mounted analytical detector
11	STEM detec-tor	• Retractable segmented (BF, DF, HAADF) Scanning Transmission detector	-	Retractable segmented (BF, DF, HAADF) Scan-ning Transmission detector

CORRIGENDUM-1

12	Electron optics	• Field emission SEM column with a high stability Schottky field emission gun to provide stable high-resolution analytical currents • The system must have Electrostatic and Magnetic objective lens/ Super Hybrid lens system assembly/Compound or equivalent lens system. • FE SEM must be able to do magnetic samples with shorter working distance. The filament should be covered in the warranty period, as many filaments required in the warranty period has to be supplied free of cost as and when required. The lenses must be water cooled in nature, and apertures must be motorized.	The lenses must have Electrostatic and magnetic objective lens/ **hybrid** /super hybrid lens / compound or equivalent lens assembly	• Field emission SEM column with a high stability Schottky field emission gun to provide stable high-resolution analytical currents • The system must have Electrostatic and Magnetic objective lens/ **hybrid**/Super Hybrid lens system assembly/Compound or equivalent lens system. • FE SEM must be able to do magnetic samples with shorter working distance. The filament should be covered in the warranty period, as many filaments required in the warranty period has to be supplied free of cost as and when required. The lenses must be water cooled in nature, and apertures must be motorized.

13	Vacuum system	•Fully automated microprocessor-controlled vacuum system comprising of Ion-Pump (for Field-emission SEM), Turbo-Molecular Pump (TMP), pneumatic valves (clarify if any in-built proper safety measures against the failure of power supply, vacuum, water-flow, etc. are provided) ~~High vacuum in the chamber to be 10^{-4} mbar or better. Low Vaccum system of Variable Pressure to attain best resolution.~~ Complete oil-free vacuum system	**System should be suitable for non-conductive samples. Variable pressure imaging 60 Pa/0.6mbar or better adjustable in the steps in 1 Pa. It should have low vacuum SE & low vacuum BSE detector**	Fully automated microprocessor-controlled vacuum system comprising of Ion-Pump (for Field-emission SEM), Turbo-Molecular Pump (TMP), pneumatic valves (clarify if any in-built proper safety measures against the failure of power supply, vacuum, water-flow, etc. are provided) **System should be suitable for non-conductive samples. Variable pressure imaging 60 Pa/0.6mbar or better adjustable in the steps in 1 Pa. It should have low vacuum SE & low vacuum BSE detector** Complete oil-free vacuum system
14	Water chiller	Air cooled Chiller of appropriate capacity	-	Air cooled Chiller of appropriate capacity
15	Compressor	Suitable low noise (quite) compressor and its accessories for all pneumatic operations		Suitable low noise (quite) compressor and its accessories for all pneumatic operations

16	Energy Dispersive System (EDS)	Liquid Nitrogen free Peltier cooled Silicon Drift Detector (SDD) capable of detecting and Quantification from Be to U. Resolution should be Mn-Kα should be equal to 129eV or better (lower in magnitude Detector area should be 30mm^2 or better EDS signal collection should be controlled from the same user interface of SEM and PC. EDS Software Should have following Features Supplied EDS server & analysis software should be capable of performing data acquisition, storing, and transfer in common Windows- based application format, qualitative & quantitative analysis, line scanning, elemental or dot-mapping (area), including elemental colour coding, including spectrum imaging and phase mapping with specimen drift correction. It should have features like peak auto identification routine, spectral match analysis, automatic background subtraction, spectrum process using filters, least square fitting and peak de- convolution. Pile up correction and and back ground noise reduction, simultaneous imaging	-	Liquid Nitrogen free Peltier cooled Silicon Drift Detector (SDD) capable of detecting and Quantification from Be to U. Resolution should be Mn-Kα should be equal to 129eV or better (lower in magnitude Detector area should be 30mm^2 or better EDS signal collection should be controlled from the same user interface of SEM and PC. EDS Software Should have following Features Supplied EDS server & analysis software should be capable of performing data acquisition, storing, and transfer in common Windows- based application format, qualitative & quantitative analysis, line scanning, elemental or dot-mapping (area), including elemental colour coding, including spectrum imaging and phase mapping with specimen drift correction. It should have features like peak auto identification routine, spectral match analysis, automatic background subtraction, spectrum process using filters, least square fitting and peak de- convolution. Pile up correction and and back ground noise reduction, simultaneous imaging

		and analysis should be possible The detector should be integrated in the SEM chamber and controlled by the same SEM user interface software and computer. The supplier should arrange for seamless interfacing, software installation and commission for EDS. Data acquisition facility in the form of ASCII values of the EDS spectra Backup software must be provided in optical media. Any further version of the software and updates must be provided free of cost. The supplier should arrange for seamless interfacing, software, installation and commission for EDS system.		and analysis should be possible The detector should be integrated in the SEM chamber and controlled by the same SEM user interface software and computer. The supplier should arrange for seamless interfacing, software installation and commission for EDS. Data acquisition facility in the form of ASCII values of the EDS spectra Backup software must be provided in optical media. Any further version of the software and updates must be provided free of cost. The supplier should arrange for seamless interfacing, software, installation and commission for EDS system.
17	Display computer and software	A suitable computer workstation with display (one for controlling another for imaging) with the Windows10 or higher OS and all the necessary supporting updated software to run the FE-SEM and all the other accessories. CPU: Intel i7 processor, 2 TB HDD, 16 GB RAM, 2 GB Nvidia graphics card, with warranty as mentioned	-	A suitable computer workstation with display (one for controlling another for imaging) with the Windows10 or higher OS and all the necessary supporting updated software to run the FE-SEM and all the other accessories. CPU: Intel **i10 processor**, 2 TB HDD, 16 GB **or higher** RAM, 2 GB Nvidia graphics card, with warranty as mentioned

CORRIGENDUM-1

		Windows 10 or higher OS • with up to 4 simultaneously active images joystick/trackball and manual user interface (knob board) Pre-loaded licensed software for total system control, including EHT, imaging, chamber pressure control, and image. Complete software for image analysis like particle size analysis, 3D imaging, super position of images etc. Image file in JPEG, TIFF and BMP formats. Software for controlling and analyzing the data for the detectors chosen along with the FESEM should be provided. Software/Firmware should be provided free of cost The latest version of the software for the quoted model should be included. All licenses should be perpetual. • User guidance enabling new or infrequent users to obtain excellent results		Windows 10 or higher OS • with up to 4 simultaneously active images joystick/trackball and manual user interface (knob board) Pre-loaded licensed software for total system control, including EHT, imaging, chamber pressure control, and image. Complete software for image analysis like particle size analysis, 3D imaging, super position of images etc. Image file in JPEG, TIFF and BMP formats. Software for controlling and analyzing the data for the detectors chosen along with the FESEM should be provided. Software/Firmware should be provided free of cost The latest version of the software for the quoted model should be included. All licenses should be perpetual. • User guidance enabling new or infrequent users to obtain excellent results

18	Scanning and Display	High definition display system (with 24 inch or more) with 20 Megapixel or better with a LED Screen for high quality image in real time under graphical user interface. 1. Imaging and processing should be optimized for the Field emission scanning electron microscopy. 2. Image frame size: Selectable up to pixel density of 4096 x 3536 or better 3. It should have auto-brightness, auto contrast, autofocus and auto stigmator. 4. Combination of pixel and frame averaging. Combination of pixel and line averaging. Image: post–processing options. Macro-Editor with access of 250 or more instrument control functions. 4 detector inputs and signal mixing or above, extendable up to 8 detector inputs Image Display a. 24" high end LED screen or better b. Standard data zone includes magnification,	-	High definition display system (with 24 inch or more) with 20 Megapixel or better with a LED Screen for high quality image in real time under graphical user interface. 1. Imaging and processing should be optimized for the Field emission scanning electron microscopy. 2. Image frame size: Selectable up to pixel density of 4096 x 3536 or better 3. It should have auto-brightness, auto contrast, autofocus and auto stigmator. 4. Combination of pixel and frame averaging. Combination of pixel and line averaging. Image: post–processing options. Macro-Editor with access of 250 or more instrument control functions. 4 detector inputs and signal mixing or above, extendable up to 8 detector inputs. Image Display a. 24" high end LED screen or better b. Standard data zone includes magnification,

		working distance, EHT, scale bar and date Custom data zone c. Multiple point-to-point and line width measurement systems freely adjustable for orientation d. Line profile display e. Images can be viewed live, averaged or integrated Image storage 1. Front-panel USB ports, CD/DVD recorder. 2. 2TB hard disk or better 3. Storage of SEM images on hard disk in standard TIFF, BMP, JPEG formats in 8 bit or 16-bit depth. 4. Operating conditions need to be stored (and retrieved whenever through Microsoft® Windows operating system (Windows 10 or above)		working distance, EHT, scale bar and date Custom data zone c. Multiple point-to-point and line width measurement systems freely adjustable for orientation d. Line profile display e. Images can be viewed live, averaged or integrated Image storage 1. Front-panel USB ports, CD/DVD recorder. 2. 2TB hard disk or better 3. Storage of SEM images on hard disk in standard TIFF, BMP, JPEG formats in 8 bit or 16-bit depth. Operating conditions need to be stored (and retrieved whenever through Microsoft® Windows operating system (Windows 10 or above)
19	Essential Accessories	Vendors must quote for • Critical Point Dryer CPD should have built-in thermos-electric heating and adiabatic cooling allow precise temperature control. The vertical pressure chamber (32 mm di-		Vendors must quote for • Critical Point Dryer CPD should have built-in thermos-electric heating and adiabatic cooling allow precise temperature control. The vertical pressure chamber (32 mm di-

		ameter x 47 mm) should have a side viewing port that allows a clear view of the liquid meniscus during filling. • Turbomolecular based sputter coater putter coater gold and carbon coating facility. The bidder should quote a suitable pump. W*ith built-in display for sputtering time and sputtering thickness* and with required accessories and coating material should be provided Evaporation source: Gold target (0.1mm thick or more) with carbon evaporation. It should be automatic with stable ion current and should produce uniform particle & coating thickness. Chamber Size: 100 mm (dia) or higher. • Online UPS, 10KVA with 1hr backup should be provided The battery should be sealed and maintenance-free. The battery shall be properly wired and contained in a battery cabinet. • Ultramicrotome (optional) Must be user friendly. PC Controlled ultra microtome with touch screen, working on windows XP based operating system having video monitoring facility.	A turbomolecular TMP/ **Rotary based sputter** for gold sputtering must be quoted separately. A standalone system for carbon sputtering facility	ameter x 47 mm) should have a side viewing port that allows a clear view of the liquid meniscus during filling. A turbomolecular TMP/ **Rotary based sputter coater** for gold sputtering must be quoted separately. • A standalone system for carbon sputtering facilityto be included. The bidder should quote a suitable pump. W*ith built-in display for sputtering time and sputtering thickness* and with required accessories and coating material should be provided Evaporation source: Gold target (0.1mm thick or more) with carbon evaporation. It should be automatic with stable ion current and should produce uniform particle & coating thickness. Chamber Size: 100 mm (dia) or higher. • Online UPS, 10KVA with 1hr backup should be provided The battery should be sealed and maintenance-free. The battery shall be properly wired and contained in a battery cabinet. • Ultramicrotome (optional) Must be user friendly. PC Controlled ultra microtome with touch screen, working

		With Viewing System: a. 10X to 50X magnification b. Illumination system-Three independent LED light sources for bright, dark-field and trans-illumination. c. Top light Illumination d. Back light Illumination e. Specimen trans-illumination Built-in anti-static device, Vibration isolation table with air isolation system, Micrometer/motorized controlled knife stage. Adjustable hand and arm rest for left and right hand operation. Cutting window: 0.2 – 10mm, Cutting speed: 0.1 to 50 mm/sec with power drive cutting stroke. Auto section ranges 1-9999 nm. Trimming block & post. At least four memory channels feed storage. At least four memory channels speed storage Return speed: up to 50mm/sec at 2-3 different selected speeds Knife maker must have the provision to cut best quality glass knives at different angles.		on windows XP based operating system having video monitoring facility. With Viewing System: f. 10X to 50X magnification g. Illumination system-Three independent LED light sources for bright, dark-field and trans-illumination. h. Top light Illumination i. Back light Illumination j. Specimen trans-illumination Built-in anti-static device, Vibration isolation table with air isolation system, Micrometer/motorized controlled knife stage. Adjustable hand and arm rest for left and right hand operation. Cutting window: 0.2 – 10mm, Cutting speed: 0.1 to 50 mm/sec with power drive cutting stroke. Auto section ranges 1-9999 nm. Trimming block & post. At least four memory channels feed storage. At least four memory channels speed storage Return speed: up to 50mm/sec at 2-3 different selected speeds Knife maker must have the provision to cut best quality glass knives at different angles.

20		• Nitrogen cylinder (2 Nos) and argon cylinders (2 Nos) as per the requirements . • All necessary consumables below: • reusable pin stubs (pack of 100), • Aluminium pin stubs 25 mm dia. Pack of 50 • Storage Tubes for 12.5mm Pin Stubs Pack of 10 • Storage Tubes for Pin Type Stubs up to 38mm Pack of 10 • SEM specimen stub storage box and holder - pack of 50 • Tweezers kit- Anti acid and Anti-Mag SS • Conductive carbon adhesive tape - aluminium foil core pack of 10 • Leit conductive Adhesive Carbon Tabs 12mm Pack of 100 • Conductive Carbon discs- Roll of 250 • conductive carbon paint for mounting SEM specimen -5 vials 40 g each • Quick Drying Silver Paint with Brush (25g)- 5	-	• Nitrogen cylinder (2 Nos) and argon cylinders (2 Nos) as per the requirements . • All necessary consumables below: • reusable pin stubs (pack of 100), • Aluminium pin stubs 25 mm dia. Pack of 50 • Storage Tubes for 12.5mm Pin Stubs Pack of 10 • Storage Tubes for Pin Type Stubs up to 38mm Pack of 10 • SEM specimen stub storage box and holder - pack of 50 • Tweezers kit- Anti acid and Anti-Mag SS • Conductive carbon adhesive tape - aluminium foil core pack of 10 • Leit conductive Adhesive Carbon Tabs 12mm Pack of 100 • Conductive Carbon discs- Roll of 250 • conductive carbon paint for mounting SEM specimen -5 vials 40 g each Quick Drying Silver Paint with Brush (25g)- 5

CORRIGENDUM-1

21	Documentation	• Online user guidance • Operating instructions handbook • Online help • Prepared for remote diagnostic support • Warranty and Training • List of users in India, with (nearly) similar systems with similar configurations installed preferably in last 3 years •The name(s) of the service engineer(s) with their locations in India	List of users in India with nearly similar configurations installed preferably **in last 5 years.**	• Online user guidance • Operating instructions handbook • Online help • Prepared for remote diagnostic support • Warranty and Training • List of users in India, with (nearly) similar systems with similar configurations installed preferably **in last 5 years** •The name(s) of the service engineer(s) with their locations in India
22	Warranty	Warranty should be covered for the period of five years. including standard warranty for the entire equipment (for the spares and gun, accessories, consumables) should be provided including all third-party items supplied by the company (Main equipment supplier). The AMC to be offered additionally. Include all the spares + consumables required for operation during warranty period. List them separately. The supplier should undertake the responsibility of spares for the next ten years after installation/discontinuation of the system/model	-	Warranty should be covered for the period of five years. including standard warranty for the entire equipment (for the spares and gun, accessories, consumables) should be provided including all third-party items supplied by the company (Main equipment supplier). The AMC to be offered additionally. Include all the spares + consumables required for operation during warranty period. List them separately. The supplier should undertake the responsibility of spares for the next ten years after installation/discontinuation of the system/model

23	Installation requirements	• Power: Voltage 100 – 240 V AC (-6%, +10%) • Frequency : 50 Hz • Environment: • Temperature (20 ± 3)°C • Relative humidity below 80% The supplier should construct necessary isolation platform/anti-vibration table/Vibration isolation system/set-up for the installation of the main equipment.	-	• Power: Voltage 100 – 240 V AC (-6%, +10%) • Frequency : 50 Hz • Environment: • Temperature (20 ± 3)°C • Relative humidity below 80% The supplier should construct necessary isolation platform/anti-vibration table/Vibration isolation system/set-up for the installation of the main equipment.
24	Pre-Installation Requirements	Pre-installation requirements such as room size, tolerable limits of EM field and vibration (mechanical), required power rating; utility requirements are to be stated clearly, and to be verified/surveyed by the supplier at the installation site.	-	Pre-installation requirements such as room size, tolerable limits of EM field and vibration (mechanical), required power rating; utility requirements are to be stated clearly, and to be verified/surveyed by the supplier at the installation site.

CORRIGENDUM-1

25	Training	Training immediately after installation and similar trainings packages to be given to a group of scientists/technical staff for operating the instrument starting from basic to advanced applications with sample preparation techniques for different types of samples. Trainingprograms may be periodically arranged for about 15 days or more and on our samples divided over 3 months valid for one year after installation. On-site training must be provided for free of cost. Commitment regarding service response time less than 48 hours should be given in writing.	-	Training immediately after installation and similar trainings packages to be given to a group of scientists/technical staff for operating the instrument starting from basic to advanced applications with sample preparation techniques for different types of samples. Trainingprograms may be periodically arranged for about 15 days or more and on our samples divided over 3 months valid for one year after installation. On-site training must be provided for free of cost. Commitment regarding service response time less than 48 hours should be given in writing.

26	Service facility in India	Supplier should clearly mention about their service set up in India for prompt service support along with number of service engineers specially trained on the offered system. Down-time call attendance should be within 48 hours under the period of warranty and annual maintenance. Breakdown period should not be counted as Warranty period and must be extended after the expiry of initial warranty period.	-	Supplier should clearly mention about their service set up in India for prompt service support along with number of service engineers specially trained on the offered system. Down-time call attendance should be within 48 hours under the period of warranty and annual maintenance. Breakdown period should not be counted as Warranty period and must be extended after the expiry of initial warranty period.
27	Operation & maintenance manuals	Soft copy or hard copy of the operation & maintenance, service manuals including detailed drawings and circuit diagrams should be provided in English for the main instrument, EDS, and all other accessories.	-	Soft copy or hard copy of the operation & maintenance, service manuals including detailed drawings and circuit diagrams should be provided in English for the main instrument, EDS, and all other accessories.
28	Optional Accessories for Future upgradation	1. Software controlled -20° C to +60° C Peltier cold stage 2. Cryo-stage 3. Sample / chamber cleaning: Cryo Cleaner, Integrated Plasma Cleaner	-	4. Software controlled -20° C to +60° C Peltier cold stage 5. Cryo-stage Sample / chamber cleaning: Cryo Cleaner, Integrated Plasma Cleaner

CORRIGENDUM-1

29	Man Power	The vendor should provide a skilled manpower for operating the system, the manpower will work as employee of the Vendor. NIFTEM will not have any legal, financial liability of the operator. Provide the year's wise breakup of the cost (UPTO 3 years) in INR. Please note the party should have at least 15 FESEM installations across the country for last 10 years. All the features (resolution, stage size, etc.) should be available globally.	-	The vendor should provide a skilled manpower for operating the system, the manpower will work as employee of the Vendor. NIFTEM will not have any legal, financial liability of the operator. Provide the year's wise breakup of the cost (UPTO 3 years) in INR. Please note the party should have at least 15 FESEM installations across the country for last 10 years. All the features (resolution, stage size, etc.) should be available globally.

Mandatory

It is mandatory to get (test) the quality of the images of the samples (will be given by us). The testing process is to be done in the presence of end user or through skype or similar web basedapplication.

Note:

- **10% deviation from the main technical specification is the sole discretion of the technical committee for betterment of the equipment.**
- The supplier is responsible for complete installation, smooth operation, maintenance and complyofallwarrantyclausesforalltheitemsorderedinthispackage.Even thoughordermay be separate for different parts in the package, the supplier is responsible for all the items in the package. Supplier has to ensure that all the items quoted under the package must be new (Models must be released after 2015). Manufacturer has to give a certificate on the Modeland the Year of the manufacture. Compatible spares

must be available for 10 years after they stop manufacturing theequipment.

- Equipment may be shifted to another building within the campus after one to two year of installation.Theequipmentshiftingshouldbefreeofcost.
- A quote may be given for an operator to be stationed at site for three years for smooth functioning of the system to serve a multi-user laboratory with breakdown below 5% of the instrument time (considering weekends too) and no down time is more than three continuous working days. The operator should not only be trained in operating but also know the installation requirements for smooth uninterrupted functioning of the FESEM. The expenses for such service are to be included in the quote. Operator may be diploma/BSc (or higher) qualified. He may be given 15 days holiday/year, other than Sundays. supplier should quote this on yearly basis. Salary (including annual hike) to the operator need to be mentioned.

- After complete installation, supplier should provide application demo. to the students, researchers, faculty members of various faculties of NIFTEM.