

RE - TENDER SCHEDULE

1. Sealed tenders are invited from reputed manufacturers/Authorized suppliers in India for supply of Liquid Chromatograph Tandem Mass Spectrometer (LC-MS/MS), Gas Chromatograph Tandem Mass Spectrometer (GC-MS/MS), Inductively Coupled Plasma Mass Spectrometer (ICP-MS), Atomic Absorption Spectroscopy (AAS) and other accessories. Specifications and all the details are given below separately.
2. **Method of Selection:** Selection of the bidders will be a two-stage process. In the first stage the bidders will be pre-qualified based on the compliance to specifications and other requirements mentioned in the Technical Bids. The bids of Technically qualified bidders only will be considered for opening the Financial Bid.
3. **The Bidder must submit one copy each of the technical bid and the Financial Bid in separate sealed covers. Bids received in unsealed conditions will be summarily rejected.**
4. The Bidders are required to submit two envelopes, one labeled 'Technical Bid' and the other labeled 'Financial bid', for each equipment separately. Both the bids must be sealed in one larger envelope and should be marked, super scribing as "Tender Notice No.", "Tender for (Name of the Equipment)- The name of the Bidder submitting the bid must also be clearly indicated on the envelope.
5. The sealed covers should be sent by the Registered Post to the registrar (or) to be dropped in the sealed box provided in the office of the Registrar on or before **31st July 2017 at 15:00 hours**.
6. Date of opening Bids:
 - a) Technical Bids: 31-07-2017 at 16:00 hrs
 - b) Financial Bids of technically qualified bids: 08-08-2017 at 10:00 hrs
7. Documents to be submitted by the bidder:
 - a) Technical bid in the format prescribed along with supporting documents like application notes and other details, if any, can be attached as mentioned herein with signature, name, designation and seal of the authorized representative of the bidder on each page of the technical bid.
 - b) Financial bid in the format prescribed in this document with signature, name, designation and seal of the authorized representative of the bidder on each page of the financial bid.
 - c) Under taking, accepting all the terms and conditions, as given in the tender document.
 - d) A list of at least 5 Installations of the quoted model or a comparable model of equivalent sensitivity in the country, preferably in Food sector along with the Contact Name, contact no, mail ID and complete address along with technical bid.
 - e) At least two Performance certificate from the organizations (at least one from the Government sector), where the quoted model/ or any other model of equivalent sensitivity has already been installed, indicating LOD/LOQ of at least 10 parameters relevant to food sector.
8. The tenderer should produce copy of GST certificate and PAN card.
9. Non-refundable processing fee, for each equipment separately, of Rs. 2000/- in the form of Demand Draft drawn in favor of "The Registrar, JNTUK, Kakinada" payable at Kakinada are only eligible to participate in the tender.
10. JNTUK is registered with DSIR and exempted from payment of excise and Customs Duty.

11. Since JNTUK is a Government University. Whatever conditions are applicable to any Government institute shall be applicable, even if not specified.
12. Any tender that is received after due date will not be accepted. JNTUK is not responsible for any postal delay.
13. **ACCEPTANCE:** It is not binding on the university to accept the lowest of the tenders. The university reserves the right to place orders for individual items with different tenderers.
14. JNTUK reserves the right to accept or reject any or all of the offers at any stage of the process without assigning any reasons thereof and any claim /dispute on this shall not be entertained.
15. No financial costs should be mentioned in the technical bid and the same shall be provided separately in a sealed envelope marked financial bid.
16. The financial bid has to be filled necessarily in the format given and has to be signed by the authorized representative of the bidder with full name designation and seal on each page.
17. Bidders should quote in INR but the Final Price offered should be inclusive of all charges involved up to delivery and installation at JNTUK Kakinada.
18. The supplier should aim at a turnkey supply and installation of the equipment. Any accessory which is felt mandatory for the proper working of the equipment but not mentioned in the specification has to be quoted and supplied along with.
19. Any unfair practice detected at any stage of the tendering process will lead to automatic disqualification/blacklisting of the concerned firm.
20. Price quoted should be valid for minimum 1 year.
21. **Delivery period:** The period of delivery at destination from date of placing orders is 60 days.
22. Payment terms:100% Payment will be made only after the receipt of all items in good condition, successful installation, satisfactory demonstration of Instrument performance as per Tender Specifications, training and validation (wherever applicable), and on receipt of the company's invoice with all required supporting documents. **No Advance will be paid in any case either in part or in full.**
23. **Delivery Terms:** F.O.R. Destination: JNTU Kakinada campus. The delivery should be compulsorily up to JNTU Kakinada. The price should be F.O.R. destination inclusive of taxes, packing & forwarding charges, freight and delivery charges.
24. The bidders need to give an undertaking that application support and services would be available for minimum 5 years.
25. Service support should be available to School of Food Technology, JNTUK turnaround time of 3 working days.
26. EMD: The tender should be submitted along with earnest money deposit in the form of Demand Draft in favor of "The Registrar, JNTUK, Kakinada" to be payable at State Bank of India, GEC campus, Kakinada. The EMD for various equipment are as follows:

S.NO	EQUIPMENT	EMD in Rs.	Rs. In words
1	LC MS/MS	2,50,000	Two Lakhs Fifty Thousand
2	GC MS/MS	2,00,000	Two Lakhs
3	ICP-MS	1,50,000	One Lakh Fifty Thousand
4	AAS	60,000	Sixty Thousand
5	MICROWAVE DIGESTION SYSTEM	30,000	Thirty Thousand
6	ON COLUMN INJECTOR / PROGRAMMED TEMPERATURE VAPORIZING INJECTOR	10,000	Ten Thousand
7	ULTRA LOW TEMPERATURE FREEZER	5,000	Five Thousand
8	REFREGERATED CENTRIFUGE	10,000	Ten Thousand
9	ROATARY EVAPORATOR	10,000	Ten Thousand
10	WATER PURIFICATION SYSTEM	10,000	Ten Thousand

Those, who participated in the earlier tender notification of even no. dated 05-03-2017 and submitted EMD, need not submit EMD for that equipment again. However, consent letter, with all the details of the EMD, has to be submitted along with the offer.

**Sd/-
Registrar**

ITEM NO: 1

CHROMATOGRAPH TANDEM MASS SPECTROMETER (LC-MS/MS)

SPECIFICATIONS

S. No.	Main Components	Heads/ Specification
1.	LC-MS/MS	A compact LC-MS/MS equipment for qualitative and quantitative estimation of food contaminants and residues (Antibiotics, Pesticides, Mycotoxins etc.) with user friendly software to meet the requirements of global food regulations like EU/USFDA/Japan/FSSAI, etc. LC and MS preferably should be from one vendor.
1.1.	Mass Stability	0.1 Da over 24 hours (please provide graphical data)
1.2.	Dynamic range	Should be 5 orders of magnitude or better
1.3.	Mass analyzer	Quadrupole Analyzer: <ul style="list-style-type: none">The instrument should be configured with a quadrupole mass filter for the efficient transmission of ions in MS mode and selection of precursor ions for MS-MS analysis.The Quadrupole mass range 5-2000 m/z or better. The Analyzer should have more than one aspect for the efficient ion separation with maximum resolution.Off-axis ion guide system to eliminate the neutrals and enhance the sensitivity will be preferable.
1.4.	Sensitivity	<ul style="list-style-type: none">ESI positive Ion Sensitivity: The unsmoothed signal/noise ratio for 1pg of reserpine should be $\geq 75,000:1$ or better, in MRM mode of reserpine at the transition m/z 609 – m/z 195 (Proof: document/application note to be enclosed along with technical tender document).ESI negative Ion Sensitivity: The unsmoothed signal/noise ratio for 1pg of chloramphenicol should be $\geq 30,000:1$ or better, in MRM mode of chloramphenicol at the transition m/z 321 – m/z 152 (Proof: document/application note to be enclosed along with technical tender document). Should be mentioned in original company Brochure/Technical Specification Sheet.
1.5.	Scan speed	Should have the scan speed of 12,000 amu per sec or better. Better scan speed will have preference.
1.6.	Ionization	<ul style="list-style-type: none">Electrospray with Concentric Gas Flow for Nebulization to cover flow rates upto 2ml/min.Multimode ionization: ESI/ APCI combined source: A combined ESI/APCI source must be provided as standard with the instrument. ESI and APCI ionization must be achieved using a single probe. It should be able to perform both ESI and APCI.Optional: APPI as an optional source
1.7.	Source Interface	<ul style="list-style-type: none">Orthogonal off-axis spray (Electrospray) or any other equally efficient technology capable of avoiding interference from solvents and other extraneous matter.De-solvation temperature should be upto 600°C

		<ul style="list-style-type: none"> Should be capable of handling large batches of complex sample matrix like Animal feeds, Fish and fishery products, poultry and poultry products, Honey, Milk and Milk products, Agriculture products (Fruits & Vegetables) etc. over a long period of time without performance degradation Cleaning of source should be done without venting the system and with facility to vacuum interlock. Interface should be capable of ambient temperature operation and without complex apertures to maintain structural integrity of thermally labile and fragile molecules.
1.8.	Integrated Fluidic Device (to minimize space and tubing)	An infusion device must be integral to the instrument or equivalent and must be controllable from the instrument software. At least 2 user-changeable sample vials should be built into the system to allow tuning and calibration solutions to be infused into the probe via the switching valve.
1.9.	Polarity switching time	+ve / -ve polarity switching time between alternate MRM scans should be 50 msec or Less (Proof: with supporting documents). Less switch over time will be having more preference.
1.10.	Vacuum System	<ul style="list-style-type: none"> Robust high efficiency vacuum system with minimum maintenance and utility with low noise level. Vacuum read backs must be digitally monitored and controlled through software to ensure fail-safe operation in the event of power failure. All accessories required for the proper functioning of the vacuum system should be supplied. Fore line pump: Oil free Scroll type pump with arrangements of AUTO- ON after Power auto age. High vacuum pump must be Turbomolecular pump.
1.11.	Gas Control	All gases must be controlled by the software
1.12.	Operating modes	<p>Mass spectrometer should have the following scan options:</p> <ul style="list-style-type: none"> Full scan Selected Ion monitoring/ recording (SIM/SIR) Product ion scan Precursor ion scan Neutral loss scan Multiple Reaction Monitoring (MRM) MS and MS/MS in a single injection with matrix background monitoring or equivalent. (Proof document /application note to be enclosed along with technical tender document with onsite verification) Simultaneous full scan and MRM or better (Optional)
1.13.	Detector	<ul style="list-style-type: none"> A high sensitivity, high throughput detector with zero dead time, low noise and high accuracy at low level detections. An off-axis dynolite photomultiplier/Electron Multiplier detector. Detector must operate in both positive and negative ion modes. Capable of switching polarity rapidly. Should have long life. Preferably for 10 years. (Life time shall be furnished and the better one will be given preference during technical evaluation).
1.14.	Nitrogen Generator	<ul style="list-style-type: none"> Should be supplied with the system along with trouble free inbuilt compressor and appropriate capacity reservoir which should be sufficient enough to deliver the gases (purity > 99.999%) required to run the system.

		<ul style="list-style-type: none"> Should be complete with all necessary accessories with Two Years comprehensive warranty with at least one Preventive maintenance along with PM kit each year and Three years CMC after the warranty period including all spares, accessories and consumables, at least one Preventive maintenance along with PM kit each year and unlimited breakdown visits.
1.15.	SPE Cartridges suitable for veterinary drug residues and pesticides	<ul style="list-style-type: none"> Minimum 10 cartridges extraction at one time. Minimum 1000 cartridges for different analytes i.e. pesticide residues, antibiotic residues etc.
2.	High Performance Liquid Chromatography System	<p>List of columns with Specification:</p> <ol style="list-style-type: none"> C-18, 2.1×100 mm× 1.7 µm with suitable Guard column C-18, 2.1×150 mm× 1.7 µm with suitable Guard column C-18, 4.6 ×250 mm× 5 µm with suitable Guard column C-8, 4.6 × 250 mm× 5 µm with suitable Guard column Phenyl-Hexyl 2.1mm × 100 × 3µm or equivalent HILIC column with Guard column <ul style="list-style-type: none"> The complete system and the MS should be controlled by the single software. PUMP: Quaternary gradient pump with capability of handling 15,000 psi pressure. Operating flow range should be 0.010-2.0ml/min or better with 0.001µl increments. Auto sampler: with 1 to 50 µl/min injection, minimum of 90 samples capacity. Sample temperature should be 4-40°C. Plunger seal was integral, active and programmable. Column Oven: 30°C to 90°C, capability to accommodate a minimum of 1 column of ≥ 15 cm. Temperature Stability: ±0.1°C Temp. Accuracy: ±0.5°C.
3.	Spares and accessories	<ul style="list-style-type: none"> LC-MS/MS startup kit should be supplied as standard. All required traceable standards for Mass calibration and tuning, HPLC calibration should be provided 5µl, 10µl, 20µl, 50µl, 100µl loops, Vacuum pump oil, etc., and any other material required to make the instrument functional should be provided. Standard Tool kit should be provided for Instrument maintenance Reputed highly branded solvent filtration unit with pump and required accessories- 02 no's.
4.	System Controller and Operating system	<ul style="list-style-type: none"> Software must be Multitasking type. It must acquire and process the data simultaneously. Application manager must be compatible with data of full scan, SIM/SIR or MRM. Data Acquisition, Peak Integration, Calibration, Quantification and QC calculations must be fully automated. The Quantification method editor must be viewable in page view or spreadsheet. Application manager must allow to monitor the molecular ion and up to 04 (four). Confirmatory ions or better. Must be capable of performing the following functions and should be upgradable: <ol style="list-style-type: none"> Workstation must be able to control the MS, acquire, store, process and reproduce the data by the same computer.

		<p>b) Workstation must be able to control LC, Detector and auto sampler.</p> <p>c) It must be able to regulate the gas pressure and flow during the data acquisition and append to the relevant data file.</p> <p>d) Software must have automated calibration and Quantitative optimization.</p> <p>e) Automated MS to MS/MS switching during a single run with user selectable criteria.</p> <p>f) Perform alternating positive/negative scans in one run.</p> <p>g) Automated Quantitation and reporting of acquired samples.</p> <p>h) Datatobe processed as it is being acquired</p>
5.	PC with Printer	<p>Minimum Intel core i5/i7 processor, 2.0 Ghz or more, 19"or more LCD/TFT Monitor, 500 GB HDD, DVD Read/Write, 4 GB RAM,4 USB Port or higher configuration for use with the above system to be provided. Reputed Branded automatic back to back colour Laser jet printer should be provided</p>
6.	Additional items	<ul style="list-style-type: none"> • In addition, the bidders should give a list of recommended consumables along with their source and budgetary prices. • Operation kit comprising all required items for startup/regular operation of instrument. • Firm should also quote all essential pre-installation requirements and utility requirement for LC-MS/MS. • Operation and maintenance manual for each unit in both hard copy and soft copy. • Service manual with set of required tools for each system/unit. • The system should have Server connectivity and should be capable of 21 CFR Part 11 and food safety compliance. The necessary validations will have to be carried out by the equipment suppliers. • Complete methods library with MRMs of Mycotoxins, Veterinary drugs, Pesticides, antibiotics with instrument method details and SOPs, related software's and user manuals to be provided. <p>PLEASE PROVIDE MAINTENANCE CHART FOR ALL OF THE COMPONENTS IN LC-MS/MS SYSTEM.</p>
7.	Operation and maintenance & Training Component	<p>The supplier will have to carry out successful installation at our laboratory premises (where ever the system has to be installed) and provide on – site comprehensive training for scientific personnel operating the system and support services till customer satisfaction with the system and a training at the suppliers lab premises is also required.</p>
8.	IQ/OQ/PQ	<p>IQ/OQ/PQ of the system is required</p>
9.	Warranty	<ul style="list-style-type: none"> • Standard Warranty (inclusive of spares, consumables, standards or glass parts etc.) of 24 months starting from date of satisfactory and faultless functioning of the equipment for 60 days at the respective laboratory premises. • Comprehensive Maintenance Contract Service for 36months after expiry of standardGuarantee/Warranty should be quoted. • Annual calibration of the equipment shall be a part of the CMC. It shall also be mandatory to perform calibration after every major repair/breakdown. • The vendor should guaranteethe supply of all types of spares/accessories for the Instrument system for a minimum period of 10 years after the warranty periodand CMC service. • The supplier or his authorized agent should have after sales and

		<p>service centre near each of our laboratory location where the equipment is to be supplied.</p> <ul style="list-style-type: none"> • Current user's / performance list with contact details (Customer name, phone email id etc) and date of installation to be provided (Minimum 5 installations of the model quoted) • Number and details of the service engineers has to be provided • Onsite technical performance evaluation of the quoted model of the equipment will be carried out for those who qualify in the technical bid.
10.	Preinstallation requirements	Provide all pre-installation requirements

ITEM NO: 2

GAS CHROMATOGRAPH TANDEM MASSSPECTROMETER (GC-MS/MS)

SPECIFICATIONS

S. No.	Main Heads/ Components	Specification
1.	GC system	<p>A compact high sensitive GC-MSMS system suitable for the analysis of Organo-chlorine pesticides, Organo-phosphorous pesticides, Synthetic Pyrethroids, PCBs and VOCs in food products and water at <1 ppb level with user friendly software. Preset-configuration for pesticide analysis should be quoted. The system should have a Triple Quadrupole geometry, capable of carrying out MS and MS/MS experiments.</p>
1.1.	Column oven	<p>The system should have</p> <p>All temperature and time functions are to be microprocessor-controlled and to be shown on the touch- screen display.</p> <ul style="list-style-type: none"> • Temperature: Operating Range Ambient +4°C to 450°C • Heating rate: from 50 to 450 °C within 5 min. • Cooling down rate: from 450 to 50 °C in less than 5 min. • Temperature programming facility. • Ramps : minimum 15 ramps with 16 plateaus or more • Maximum inlet temperature ramp rate : 120°C / minute or better for all voltages • Should have oven power safety(power off when door is open)
1.2.	Column	<ul style="list-style-type: none"> • Dimensions: 30m x 0.250mm x 0.25µm

		<ul style="list-style-type: none"> • HP-5MS/ DB-1MS or equivalent) (02 no.) • DB-5/ HP-5 or equivalent (01 No) • DB 1301 or equivalent (01 No)
1.3.	Inlet	<p>The system should have</p> <p>Programmable Temperature Vaporizer (PTV)</p> <ul style="list-style-type: none"> • Temperature ramped split / splitless and large volume injection modes. • Electronic pressure/ flow control. • Pressure setting range 0 to 100psi or more • Inlet should be temperature programmable upto 8 ramps and should have heating rate better than 800°C /min
1.4.	Auto Sampler	<p>The system should have</p> <ul style="list-style-type: none"> • Internal standard addition facility • Auto injector / sampler for Liquid injector (minimum 100 vials). • Capable of handling large volume injection with syringe size from 0.5 to 250 µl. • Completely programmable from software. • Optional: New Headspace sampler with vial shaking capability. <p>Complete automation from sample heating to data processing.</p> <p>Electronic Flow and pressure control and setting of independent method parameters.</p> <p>Vial pressurization and loop fill pressurization technology.</p> <p>90 Vial position sampler.</p> <p>Automatic leak check.</p> <p>Electro cooling trap.</p> <p>Records vial pressure for each vial and indicates pressure leakage.</p> <p>Built-in Self-diagnostic function.</p> <p>For Head Space:</p> <p>syringe (5 no. each) and</p> <p>Vials with cap for 10 and 20 ml capacity (each 50 No.)</p>
1.5.	Backflush	<ul style="list-style-type: none"> • The system should have column end or mid column backflush to remove unwanted components/contaminants/high boilers.
2.	MS/MS System	<p>The system should have</p> <ul style="list-style-type: none"> • Mass range: Qudrupole 10 to 1000 amu or better. • Mass resolution: minimum 0.7 (width at half height). • Mass axis stability: ±0.1 amu over 24 hours or betterfor a temperature range 15 to 25°C • Linear Dynamic range: minimum 6orders of magnitude.

		<ul style="list-style-type: none"> • Scan rate (electronic): 10000 amu/sec or better • Ionization modes: EI (Electron ionization) and CI (Chemical ionization) modes Ion source should have heating capacity of 350°C or more. • Ion source temperature 110 to 350 °C. • CI: must be capable to operate with different reagent gasses & electronic flow control for reagent gasses. • Collision cell gas pressure must be electronically/Software controllable. • Collision energy must be variable. • Scan Modes: <ul style="list-style-type: none"> i. Should be able to do Scan, SIM, MRM/SRM, Parent ion scan, Product ion Scan, and Neutral loss scan-time segment based. ii. Simultaneous Full Scan-SIM or Full Scan/MRM or SRM whenever required. iii. SRM/MRM Speed: minimum of 800 MRM/sec iv. Minimum MRM dwell time of 0.5 milliseconds or better. • Installation checkout sensitivity must be better than – • Instrument detection limit: 4 fg or less octafluoronaphthalene (OFN) EI Scan sensitivity: 1 µl of 1 pg/µl Octafluoronaphthalene (OFN) should give S/N greater than 1000:1 in scan mode 1 µl injection from m/z 50 to 300 for m/z 272. EI MRM Sensitivity: 1 µL of 100 fg/µL Octafluoronaphthalene (OFN) should produce minimum signal- to-noise for the transition from m/z 272 to m/z 222: 14,000:1 or better on 30m x 0.250mm x 0.25µm column. PCI MRM S/N 1 µL of 100 fg/µL BZP produces > 50:1 RMS S/N for the transition of m/z 183 →105 (CH4). NCI SIM S/N 1 µL of 100 fg/µL OFN produces > 2,000:1 RMS S/N for m/z 272 (CH4). (Proof document/application note to be enclosed along with technical tender document). Should be mentioned in original company Boucher/Technical Specification Sheet. • Turbomolecular pump: Air cooled turbomolecular pumps, Rotary vane fore-line pumps supporting the turbo- molecular vacuum pump • Noise reduction cover for fore line pump. • Software controlled auto-tune or manual- tune to enable quick start-up for quantitative analysis. • Independently heated GC / MS interface. • Extended dynamic range Electron Multiplier or off-axis high-energy detector with configuration to direct the charged ion of interest away from the neutrals with long life and better sensitivity. • The instrument supplier has to demonstrate that the machine is suitable for the analysis of Organo-chlorine pesticides, Organo- phosphorous pesticides, Synthetic Pyrethroids, PCBs and VOCs in Fish, vegetables and water at < 1ppb level.
3.	Nitrogen evaporator	The system should be provided with a suitable Nitrogen evaporator system of 20- 25 samples processing capacity in one batch along with proper fume hood system. The specification along with the model should be provided at the time of tendering.
4.	System Controller and Operating	<ul style="list-style-type: none"> • Should have capability to run the mass spectrometer in all the modes specified in Scan mode. • Data acquisition, integration, calibration, quantification and QC calculations must be automated • Manual and Auto tune options should be provided. • Automatic MRM/SRM method Development

	system	<ul style="list-style-type: none"> Library searching facility with Licensed NIST Library (in CD/ROM Format). Pesticides and endocrine disruptors, PCB's, VOC's, Fatty Acid Methyl Esters, and artificial flavors. MRM database for a Pesticides and Environmental pollutants better than 1100 compounds with Retention time and chromatographic conditions. 21 CFR part 11 & food safety compliance. <p>Quantitative analysis- Qualitative analysis</p> <p>Features</p> <ul style="list-style-type: none"> Importing of information directly from the acquisition method Shall Provide a curve-fit assistant to test all fits and statistics on curve quality Shall have an automated, parameter-free integrator that uses a means optimized for triple Quadra pole data For fast method development, the software shall have features to quickly review the qualitative aspects of the data, such as the optimum precursor to product ion transitions. Qualitative Analysis program to present data for review in one central location. Extract chromatograms View and extract peak spectra Subtract background Integrate the chromatogram Find compounds
5.	PC with Printer	<ul style="list-style-type: none"> Minimum Intel core i5/i7 processor, 2.0 Ghz or more, 19" or more LCD/TFT Monitor, 500 GB HDD, DVD Read/Write, 4 GB RAM, 4 USB Port or higher configuration for use with the above system to be provided. Reputed Branded automatic back to back colour Laser jet printer should be provided
6.	Sample Preparation kits	<p>QuEChERS Kits (1000 nos each) for Pesticides etc in following matrices:</p> <ul style="list-style-type: none"> Water High fat containing food High Water content food Highly Pigmented foods (eg chlorophyll, lycopene, carotene etc)
7.	Accessories and Consumables	<p>Sample injector :</p> <ol style="list-style-type: none"> For liquid injection (5 no. each) Air tight syringe (for manual injection) (2 no. each) Manual syringe for liquid injector (2 no. each) <p>Auto sampler vials: 500 vials with screw cap.</p> <ol style="list-style-type: none"> Vials with cap for 1.5 ml capacity (100 No.) <ul style="list-style-type: none"> Column Ferrules- injector end and interface end (20 No. each). Septa for injector (100 No.). Appropriate nuts to fit capillary columns to the injector and MS interface (10 each). Inlet liner for Splitless, Split (with glass/quartz wool at optimum position) and PTV (with glass/quartz wool at optimum position) (10 No. each) O-ring for injector liner (20 No.) Split vent trap (2 No.) EI Filaments (5 No.) CI Filaments (5 No.) Column cutter (2 No.) Gas tube cutter. Oil mist trap for pump (2 No.). Tool kit. <p>Optional: Any other accessory as felt required for the proper functioning of the equipment.</p>
8.	Additional items	<ul style="list-style-type: none"> Operation kit comprising all required items for startup/regular operation of instrument.

		<ul style="list-style-type: none"> • Firm should also quote all essential pre- installation requirements and utility requirement for GC-MS/MS. • Operation and maintenance manual for each unit in both hard copy and soft copy. • Service manual with set of required tools for each system/unit. • The system should have Server connectivity and should be capable of 21 CFR Part 11 and food safety compliance. The necessary validations will have to be carried out by the equipment suppliers. • Methods library for all food matrixes, related software's and user manuals to be provided. • Automated ion source cleaning module to extend source maintenance free operation. <p>PLEASE PROVIDE MAINTENANCE CHART FOR ALL OF THE COMPONENTS IN GC-MS/MS SYSTEM</p>
9.	Operation and maintenance & Training Component	The supplier will have to carry out successful installation at our laboratory premises (where ever the system has to be installed) and provide on – site comprehensive training for scientific personnel operating the system and support services till customer satisfaction with the system and a training at the suppliers lab premises is also required
10.	IQ/OQ/PQ	IQ/OQ/PQ of the system is required
11.	Warranty	<ul style="list-style-type: none"> • Standard Warranty (inclusive of spares, consumables, standards or glass parts etc.) of 24 months starting from date of satisfactory and faultless functioning of the equipment for 60 days at the respective laboratory premises. • Comprehensive Maintenance Contract Service for 36 months after expiry of standard Guarantee/Warranty should be quoted. • Annual calibration of the equipment shall be a part of the CMC. It shall also be mandatory to perform calibration after every major repair/breakdown. • The vendor should guarantee the supply of all types of spares/accessories for the Instrument system for a minimum period of 10 years after the warranty period and CMC service. • The supplier or his authorized agent should have after sales and service centre near each of our laboratory location where the equipment is to be supplied. • Current user's / performance list with contact details (Customer name, phone email id etc) and date of installation to be provided (Minimum 5 installations of the model quoted) • Number and details of the service engineers has to be provided • Onsite technical performance evaluation of the quoted model of the equipment will be carried out for those who qualify in the technical bid.
12.	Pre installation requirements	Provide all pre-installation requirements

ITEM NO: 3

INDUCTIVELY COUPLED PLASMA MASS SPECTROMETER(ICP-MS)

SPECIFICATIONS

S. No.	Main Heads/ Components	Prescribed Specification
1.	System Application	<p>The system should have</p> <ul style="list-style-type: none">• Computer controlled fully automatic ICP- MS system• Simultaneous multi-elemental analysis in ppm, ppb and ppt levels with required sensitivity and stability of diverse range of food and water samples• The system should be a space saving, compact model that can fit into allocated lab space with all the sub- systems and accessories.• Should have dedicated three gas channels for collision and reaction gases like He& or O₂&or H as per the system hardware requirement.• Corrosion-resistant exteriors should be provided• Model number of the equipment proposed to be supplied to be clearly mentioned
2.	Sample Introduction system	<p>The system should have</p> <ul style="list-style-type: none">• Nebulizer: Concentric Micro mist Nebulizer with low sample flow rate of less than 0.25 ml/min• Spray Chamber: Peltier controlled Spray Chamber from temperature -5°C to Room Temp for Better Stability, Repeatability and also Organic Sample upgradation for near future.• Peristaltic pump: Low pulsation high precision peristaltic pump with minimum of three separate channels which can be controlled through the software.
3.	Plasma	<p>The system should have</p> <ul style="list-style-type: none">• RF Generator: RF Power range: 500W to 1600 W. Radio Frequency Generator (Solid State): 27- 40 MHz Impedance Matching: Auto-tuning to get maximum coupling efficiency.• Torch: Easy mountable single piece quartz torch with shield torch (i) Torch movement should allow for complete computer-control and

		<p>auto tunable in x-y-z directions with independent movements in the three directions.</p> <p>(ii) Provision for Auto-alignment of the torch after routine maintenance with a reproducibility better than 0.1 mm in x-y-z directions</p> <ul style="list-style-type: none"> • Plasma Gas Control: Should have at least 3 Mass Flow Controllers (AMFC) or equivalent PC Controller for control plasma, auxiliary makeup, carrier gases. Gases used should be controlled with mass flow controller and fully computer controlled. • Argon gas dilutor or equivalent technology must be quoted along with the main instrument. • System should have the provision of argon dilution to analyze samples with more than 25% TDS without manual or diluent dilution to improve the Sensitivity, Should be compatible for analysis in presence of High TDS Matrix like Food and Sea Water. Provision for Direct undiluted Seawater aspiration to be available to detect toxic element like As, Hg, Cd, Cr in 1 PPT level.
4.	Ion Extraction Interface	<p>The system should have</p> <ul style="list-style-type: none"> • Standard sample and skimmer cones with large orifice diameters to suit all application and to prevent clogging and minimize signal drift. It should be easily mountable and dismountable. • Single Skimmer Cone and Sample Cone for High Sensitive samples in 1 PPT and High TDS samples up to 2.5 % PPT. • Scope of supply of standard (Nickel) and optional (Platinum) cones should be clearly specified. (for any alternate material, bidder would need to prove sensitivity) • Lens/ extraction cones or equivalent should be easy to maintain.
5.	Ion Focusing System	<p>The system should have</p> <ul style="list-style-type: none"> • Ion focusing system with efficient mechanism for removing all neutrals and photons from the Ion path. • Cell offering three modes of operation: Standard Mode, Collision Cell Mode and Reaction Cell • Switching of reaction and collision gases shall be through software and automated. Unit shall have the flexibility of applying both (collision, and reaction) gases using single method for removal of interferences. Low and High Mass Cut off facility or equivalent technology should be there to remove unwanted polyatomic interferences formed due to free atoms. • A reaction cell should be provided for poly atomic interference removal allowing use of pure Ammonia or Oxygen or Hydrogen. Separate AMFCs for Reaction cell gases. • Vendor should attach application notes for Arsenic analysis as per FSSR where O₂ or any other suitable gas is used to remove interference for ArCl which demonstrates mass shift mode. • Reaction cell assembly and octopole/ hexapole assembly (if requires cleaning any time in lifetime) should be quoted.
6.	Quadrupole Assembly	<p>The system should have</p> <ul style="list-style-type: none"> • Quadrupole Mass Analyzer: A quadrupole mass analyzer to provide effective ion transmission, superior resolution and abundance sensitivity. • Mass range: 5-260 amu or better • RF Frequency : Fully Digital RF generator with frequency 2-3 MHz • Abundance sensitivity: Low Mass Side: $\leq 5 \times 10^{-7}$ High Mass side: $\leq 1 \times 10^{-7}$ • Scan Speed: Greater than 3000 amu/s • Mass stability: $< \pm 0.05$ amu over 8 hours of continuous operation. • Resolution: Variable from 0.5 u to 1.0 u or better, user definable

7.	Ion Detector Assembly	<p>The system should have</p> <ul style="list-style-type: none"> • Solid State dual stage dynode discrete with 11 orders or more magnitude of linear dynamic range. • Should have, features of high speed analog mode for transient signals and a true nine orders dynamic range. • Minimum dwell time / integration time of 100 μs (in both pulse count and analog modes). • Dual-stage detector assembly should come as a standard with the system.
8.	Vacuum System	<p>The system should have</p> <ul style="list-style-type: none"> • Efficient Vacuum system with turbo molecular pump and single external rotary pump for fast pump down and simple maintenance. • In the event of vacuum failure, the entire vacuum system is to be automatically back-filled by inert gas to preserve the cleanliness of the system or an alternate system.
9.	Performance Specifications	<p>Guaranteed sensitivity specifications will be considered (To be demonstrated during Demo): Typical sensitivity values will not be considered</p> <ul style="list-style-type: none"> • Should be able to analyze Sn, Ni, Cu, Zn, Ba, Sb, Ni, B, Ag, Mg, Ca, Na, As, Cd, Cr, Hg, Pb, Se, Fe (but not limited to these elements) at a concentration of 0.05ppb with RSD of <5% at standard conditions. • Oxide ratio (%) CeO/Ce < 2 % • Double charged ratio < 3 % • Isotope-ratio Precision: 1%RSD
10.	Water Chiller	<p>The system should have a suitable re-circulating chiller changer of internationally reputed company for plasma component cooling.</p>
11.	Auto Sampler / Diluter	<p>The system should have</p> <ul style="list-style-type: none"> • Highly effective auto sampler/ diluter compatible with operation along with ICPMS without user intervention. • Auto sampler with minimum 200 vials holding capacity with 500 nos. of 15 ml capacity tubes (as consumable). • Programmable complete with inert PTFE coated probe with PTFE inner tubing. • Spare extension tube complete with 20 ml syringe for programmed auto dilution • All accessories, racks, bottles, tubing assembly, waste container, dust cover etc.
12.	System and Controller Operating System	<p>The system should have</p> <ul style="list-style-type: none"> • Software control for automatic data acquisition and processing. • Mass spectrometer tuning and calibration auto and manual. • Data Validation (IQ/OQ/PQ for Software) • Self-diagnostics • Multi element analysis capability, Isotope ratio and dilution • Cool Plasma or other facility to eliminate polyatomic interferences. • Remote diagnostics • Software should control plasma, MS and other accessories like auto sampler • The system software shall support the following calibration curve fit modes for Quantitative analysis: <ul style="list-style-type: none"> i. Linear least squares. ii. Weighted linear least Squares iii. Linear forced-through-zero least squares. iv. Quantitative analysis including external calibration, additions calibrations, method of standard additions, isotope ratios and isotope dilution's and semi quantitative analysis. v. On-line help with quick steps to reference entire instrument user manual.
13.	Computer	<ul style="list-style-type: none"> • Minimum Intel core i5/i7 processor, 2.0 Ghz or more, 19" or more LCD/TFT Monitor, 500 GB HDD, DVD Read/Write, 4 GB RAM, 4 USB Port or higher configuration for use with the above system to be provided. • Reputed Branded color Laser jet printer and automatic back to back should be provided

14.	Exhaust unit	Exhaust unit for the ICP-MS has to be supplied along with the System
15.	Accessories	<p>The following Items, but not limited to, has to be supplied along with the equipment</p> <ul style="list-style-type: none"> • Peristaltic pump tubing-sample intake – 100 No's • Peristaltic pump tubing-Drain – 100 No's • Tubing – Auto Sampler to Peristaltic Pump – 25 No's • Micro mist nebulizer – 5 No's • Plasma Torch – 5 No's • Ni Sampling Cone – 4 No's and Pt Sampling Cone – 2 No's • Ni Skimmer Cone – 4 No's and Pt Skimmer Cone – 2 No's • Hyper skimmer cones/extraction system for HF digested sample. • Vacuum Pump oils – 5 litres • Argon Gas Cylinders-6 • Gas cylinder for Collision cell gases –Helium-1 • Gas cylinder for Reaction cell gases - Oxygen, Hydrogen & Ammonia (>99.99 % mixed or pure as per system requirement), whichever is applicable for individual system for elimination of interference species along with 3 stage Gas pressure regulators for each cylinder. • Gas purification panel for Argon, Oxygen, Helium & Hydrogen with appropriate plumbing. • Optional: Any other accessory as felt required for the proper functioning of the equipment. <p>All vendor should provide maintenance chart for their ICPMS system along with consumables and spares required frequently</p>
16.	Additional items	<ul style="list-style-type: none"> • Consumables for Three years of operation of the system for main ICP unit, spare torches, nebulizer, tunings, and moisture trap are required to be quoted. • In addition, the bidders should give a list of recommended consumables along with their source and budgetary prices. • Operation kit comprising all required items pump tubings, transfer tubings, work coils etc., for startup/regular operation of instrument. • Firm should also quote all essential pre- installation requirements and utility requirement for ICP-MS. • Give the Detection limits (DL) chart for Sn, Ni, Cu, Zn, Ba, Sb, Ni, B, Ag, Mg, Ca, Na, As, Cd, Cr, Hg, Pb, Se, Fe (but not limited to these elements. Provide for as many elements as vendor can) and give the conditions at which the DLs are measured. • Operation and maintenance manual for each unit in both hard copy and soft copy. • Service manual with set of required tools for each system/unit. • The system should have Server connectivity and should be capable of 21 CFR Part 11 and food safety compliance. The necessary validations will have to be carried out by the equipment suppliers. • Methods library for all food matrixes, related software's and user manuals to be provided. <p>PLEASE PROVIDE MAINTENANCE CHART FOR ALL OF THE COMPONENTS IN ICPMS SYSTEM.</p>
17.	Operation and maintenance & Training Component	The supplier will have to carry out successful installation at our laboratory premises (where ever the system has to be installed) and provide on – site comprehensive training for scientific personnel operating the system and support services till customer satisfaction with the system and a training at the suppliers lab premises is also required.

18.	IQ/OQ/PQ	IQ/OQ/PQ of the system is required
19.	Warranty	<ul style="list-style-type: none"> • Standard Warranty (inclusive of spares, consumables, standards or glass parts etc.) of 24 months starting from date of satisfactory and faultless functioning of the equipment for 60 days at the respective laboratory premises. • Comprehensive Maintenance Contract Service for 36 months after expiry of standard Guarantee/Warranty should be quoted. • Annual calibration of the equipment shall be a part of the CMC. It shall also be mandatory to perform calibration after every major repair/breakdown. • The vendor should guarantee the supply of all types of spares/accessories for the Instrument system for a minimum period of 10 years after the warranty period and CMC service • The supplier or his authorized agent should have after sales and service centre near each of our laboratory location where the equipment is to be supplied. • Current user's / performance list with contact details (Customer name, phone email id etc) and date of installation to be provided (Minimum 5 installations of the model quoted) • Number and details of the service engineers has to be provided • Onsite technical performance evaluation of the quoted model of the equipment will be carried out for those who qualify in the technical bid.
20.	Preinstallation requirements	Provide all pre-installation requirements

ITEM NO: 4

ABSORPTION SPECTROSCOPY (AAS)

SPECIFICATIONS

S. No.	Main Heads/ Components	Specifications
1.	System Application	<p>The system should have</p> <ul style="list-style-type: none"> • True Double beam system. For Different samples of sea water, soil, back water, effluents, soil sediments, Biota, Plant & Animal parts for Heavy metals Hg, As, Zn, Cd, Cu, Pb, Cr, Co, Ni, Fe, Mn, Na, Ca concentration range of Percentage, PPM, PPB, Sub PPB. Preferred Elements to be analyzed in a single aspiration. A compact integrated dual atomizer system with inbuilt flame and furnace atomizers. • An instant changeover from Flame to Furnace mode and vice-versa should be automatic through the software. • The vertical and horizontal alignment of the flame burner head in the light beam should be totally automatic through the software. • The system should be a compact model that can fit into allocated lab space with all the sub-systems and accessories. • Corrosion-resistant exteriors should be provided • Model number of the equipment proposed to be supplied to be clearly mentioned
2.	Sample Introduction system	<p>The system should have</p> <ul style="list-style-type: none"> • A high sensitivity nebulizer system including impact bead and flow spoiler with corrosion resistant against the acids like 5% hydrofluoric acid, hydrochloric acid and Nitric Acid. • Modular sample introduction system with quick-change spray chamber, burner head and nebulizer units. • Adjustable Nebulizer with inert platinum/iridium capillary and peek ventury for Corrosion Resistance. • 100 mm air-acetylene titanium burner head and 50 mm Nitrous oxide burner head with quick change burner head assembly. Alignment of the flame in the light beam shall be fully automatic, using a motorized burner mount for

		<p>vertical and horizontal burner adjustment and automatic software-controlled self-optimization of the burner position.</p> <ul style="list-style-type: none"> • The optimization of the operating flame conditions shall be fully automatic and software-controlled. • Corrosion resistant spray chamber. Preferably, Should be fluorinated high density polyethylene or 100 % pure PTFE or inert polymer type for aqueous and organic solutions.
3.	Optical System	<p>The system should have</p> <ul style="list-style-type: none"> • A true double beam spectrometer system with high light throughput • Monochromator system with a diffraction grating ruling density of at least 1800 lines/mm blazed in both the UV and Visible regions and Wavelength Repeatability: ± 0.04 nm/min or better. • A focal length of above 310 mm and the Reciprocal Linear Dispersion of 1.6-0.8 nm/mm • Variable slit width between 0.2 to 2.0 nm with automatic slit selection
4.	Atomizer System	<p>The system should have</p> <ul style="list-style-type: none"> • The heating of the Graphite Atomizer should be through the walls of the tube, ensuring the uniform temperature distribution across the graphite tube. • The Graphite Furnace Atomizer must be permanently aligned with no movement, alignment and optimization required. • The system should be equipped with an integrated graphite furnace camera for easy autosampler tip alignment and real time viewing of the process happening in graphite furnace. • Temperature Control with cooling water temperature compensation for enhanced temperature accuracy without external sensors. Up to 20 temperature steps per program with temperature programmable from 40-3000 °C. • Heating rates shall be software controlled with maximum ramp rate of 2000 °C/s. Choice of two inert gases with PC-controlled flows. • Lifetime of the graphite tube should exceed 5000 firings for an aqueous Cu standard using an atomization temperature of 2300 deg. C. Minimum absorbance of 0.15 required for 10 µL injection of 25 µg/L Cu standard. • The Graphite Furnace system should be equipped with pyrolytically coated graphite tube, L'vov platform, rapid furnace heating (up to 2000 °C/s), internal gas stop, matrix modification, fast signal processing, peak area measurements and Zeeman background correction for effective interference removal. • An imported air compressor and an imported recirculating water chiller unit of appropriate capacity for cooling of Graphite Furnace must be quoted by the manufacturer. • Must provide min. sample capacity of 130 solutions with ability to exchange carousels during analysis to extend capacity up to 999 samples • Dispensing volume variable from 1-70 µL with < 1% repeatability (5-70 µL). Flow through capillary rinse after each injection.
5.	Lamps	<p>The system should have</p> <ul style="list-style-type: none"> • Minimum 8 lamp holder with a provision of automatic lamp selection and fixed lamp positions. • Built-in power supplies for both the Coded Hollow Cathode Lamps (Hg, As, Zn, Cd, Cu, Pb, Cr, Co, Ni, Fe, Mn, Na, Ca) and the special lamps that are used for the analysis of volatile elements like As, Hg, Se. (e.g. Boosted HCL's Ultra Lamps, , Super Lamps, Electrode Less Discharge Lamps, etc.). All the lamps quoted will be coded.
6.	Detector	<p>The system should have</p> <ul style="list-style-type: none"> • Photomultiplier Tubes (PMT) or Solid State Detector • Wavelength range: 184 – 900 nm
7.	Burner Rotation /	<p>The system shall be offered with auto dilution acc for flame or Auto Burner rotation in various angles for over range samples or samples falling out side calibration range. The system shall be quoted with this attachment for various applications of over range environmental, food, effluent etc type samples. This</p>

	Auto Diluter for over range samples operated thru AAS software	feature shall be software controlled.
8.	Background Correction Methodology	<p>The system should have</p> <ul style="list-style-type: none"> • Continuum Source (Deuterium Lamp) Background Correction for Flame • Zeeman Background Correction for the Graphite Furnace with the magnetic field parallel to the light beam
9.	Gas Flows system	<p>The system should have</p> <ul style="list-style-type: none"> • Software controlled flame ignition and automatic changeover of oxidant flow from acetylene to nitrous oxide when switching to or from air-acetylene to nitrous oxide - acetylene flame • Fully software controlled oxidant and fuel gas flow monitoring. • No manual or Rotameter Auto gas control system will be accepted.
10.	Sensitivity	Greater than 0.9 absorbance with the precision of <0.5% RSD from 5 second integrations for 5 ppm Cu standard which should be demonstrated
11.	Automated Hydride generator	<p>The system should have</p> <ul style="list-style-type: none"> • Vapor/hydride analysis for flame and furnace for ppb and ppt levels respectively. System should include Automatic hydride generator along Peristaltic Pump, software control, for As, Hg, Se for sub PPB Levels or much better for Analysis • Modular continuous flow Vapor Generation Accessory for automated determination of Hg, As, Se, Sb, Te, Bi and Sn at µg/L concentrations. Typical precision 1-2% RSD with sample throughput of 60-70 samples/hour. • System should include PC controlled Automatic hydride generator along Peristaltic Pump, Mixing cell, software control, for Hg, As Se for sub PPB Levels Analysis. Capacity for up to 50 samples in 2 mL microvials
12.	Computer	<ul style="list-style-type: none"> • Minimum Intel core i5/i7 processor, 2.0 Ghz or more, 19" or more LCD/TFT Monitor, 500 GB HDD, DVD Read/Write, 4 GB RAM, 4 USB Port or higher configuration for use with the above system to be provided. • Reputed Branded color Laser jet printer and automatic back to back should be provided
13.	Accessories	<p>The following Items, but not limited to, has to be supplied along with the equipment</p> <ul style="list-style-type: none"> • Nitrous oxide gas regulator with pre heater • Double stage regulator for acetylene • Nitrous oxide and Acetylene gas cylinders • Oil free Air Compressor • Water circulator with different pressure setting and flow rates upto 4 liters per min to be included for GF furnace operation. <p>Optional: Any other accessory as felt required for the proper functioning of the equipment.</p>
14.	Additional items	<ul style="list-style-type: none"> • In addition, the bidders should give a list of recommended consumables along with their source and budgetary prices. • Operation kit comprising all required items pump tubing's, transfer tubing's, work coils etc., for startup/regular operation of instrument. • Firm should also quote all essential pre- installation requirements and

		<p>utility requirement for AAS.</p> <ul style="list-style-type: none"> • Give the Detection limits (DL) chart for Sn, Ni, Cu, Zn, Ba, Sb, Ni, B, Ag, Mg, Ca, Na, As, Cd, Cr, Hg, Pb, Se, Fe (but not limited to these elements. Provide for as many elements as vendor can) and give the conditions at which the DLs are measured. • Operation and maintenance manual for each unit in both hard copy and soft copy. • Service manual with set of required tools for each system/unit. • The system should have Server connectivity and should be capable of 21 CFR Part 11 and food safety compliance. The necessary validations will have to be carried out by the equipment suppliers. • Methods library for all food matrixes, related software's and user manuals to be provided. <p>PLEASE PROVIDE MAINTENANCE CHART FOR ALL OF THE COMPONENTS IN AAS SYSTEM.</p>
15.	Operation and maintenance & Training Component	The supplier will have to carry out successful installation at our laboratory premises (where ever the system has to be installed) and provide on – site comprehensive training for scientific personnel operating the system and support services till customer satisfaction with the system and a training at the suppliers lab premises is also required.
16.	IQ/OQ/PQ	IQ/OQ/PQ of the system is required
17.	Warranty	<ul style="list-style-type: none"> • Standard Warranty (inclusive of spares, consumables, standards or glass parts etc.) of 24 months starting from date of satisfactory and faultless functioning of the equipment for 60 days at the respective laboratory premises. • Comprehensive Maintenance Contract Service for 36 months after expiry of standard Guarantee/Warranty should be quoted. • Annual calibration of the equipment shall be a part of the CMC. It shall also be mandatory to perform calibration after every major repair/breakdown. • The vendor should guarantee the supply of all types of spares/accessories for the Instrument system for a minimum period of 10 years after the warranty period and CMC service • The supplier or his authorized agent should have after sales and service centre near each of our laboratory location where the equipment is to be supplied. • Current user's / performance list with contact details (Customer name, phone email id etc) and date of installation to be provided (Minimum 5 installations of the model quoted) • Number and details of the service engineers has to be provided • Onsite technical performance evaluation of the quoted model of the equipment will be carried out for those who qualify in the technical bid.
18.	Preinstallation requirements	Provide all pre-installation requirements

ITEM NO: 5

MICROWAVE DIGESTION SYSTEM

SPECIFICATIONS

S. No.	Specifications
1.	<p>Digestion unit made up of stainless steel with PTFE coated cavity with high efficiency cooling unit.</p> <p>Volume of Resonant Cavity: 60 L or more</p> <p>Maximum withstanding temperature of cavity: 300-350°C.</p> <p>Max Operation Temperature: $\geq 250^{\circ}\text{C}$</p> <p>Temperature accuracy: $\pm 0.1^{\circ}\text{C}$</p> <p>Temperature control stability: $\pm 1^{\circ}\text{C}$</p> <p>Vessel Design Pressure range: 140-150 bar or more (2200psi or more) Operating pressure should be 100 bar or more</p> <p>Microwave source: Dual magnetrons with uniform heat distribution.</p> <p>Safety: door lock and highly safe door</p> <p>Inner vessel: High strength frame, made up of PTFE - TFM, Safety precaution for pressure release</p> <p>Auto-venting vessel: High purity PTFE - TFM lined, easy manipulation of rotors, vessels and sensors.</p> <p>Temperature monitoring: IR sensor for efficient monitoring of temperature.</p> <p>Programme control and viewing: LCD screen with touch screen operating monitoring. Easy data saving review and export.</p> <p>Power input: 220-240 v/50 Hz, 15 A</p> <p>Power consumption: 3000-3200 w</p> <p>Maximum microwave output: 1600-1900 W</p> <p>Microwave frequency: 2400-2500 MHz</p> <p>Microwave emission mode: Continuous.</p> <p>Rotors: 15 or more vessels operable at 100 bar pressure, 100 ml volume</p> <p>Upgradable to perform extractions as per EPA METHOD 3546 & ASTM D-6010.</p> <p>Upgradable to perform heating for ashing and fusions</p> <p>Along with required consumables, accessories and installation.</p> <p>Standard Warranty (inclusive of spares, consumables, standards or glass parts etc.) of 24 months starting from date of satisfactory and faultless functioning of the equipment for 60 days at the respective laboratory premises.</p> <p>Comprehensive Maintenance Contract Service for 36 months after expiry of standard Guarantee/Warranty should be quoted.</p> <p>Annual calibration of the equipment shall be a part of the CMC. It shall also be mandatory to perform calibration after every major repair/breakdown.</p> <p>The vendor should guarantee the supply of all types of spares/accessories for the Instrument system for a minimum period of 10 years after the warranty period and CMC service.</p>

ITEM NO: 6

ON COLUMN INJECTOR / PROGRAMMED TEMPERATURE VAPORIZING INJECTOR (PTV)

SPECIFICATIONS

S. No.	Specifications
1.	<ul style="list-style-type: none">• Cool injector / suitable for thermally labile compounds.• Compatible for direct introduction of Sample onto the column.• Shall be compatible for special syringe (needle narrows at the tip) and a 0.53 mm I.D. column.• Programmable Injection temperature.• No split flow (direct mode)/OCI adaptor.• Sample is introduced into a cool injector through PTV glass insert.• Nonvolatile compounds are not deposited directly on the column.• Injection temperature is programmed with a rapid heating rate (e.g. 250° C/min).• Programmable Split flow (split piping).• Shall have possibility for larger volume of injection.• Packing option of glass insert.• Glass insert for PTV Injection.

ITEM NO: 7

TABLE TOP REFRIGERATED CENTRIFUGE

SPECIFICATIONS

S. No.	Specifications
1.	Maximum Speed : 14,000 RPM Maximum RCF : 21,800g Temperature range : -9°C to +40 °C Display : Digital for speed, Temperature and time Timer : 0-99 Min and hold Mode Power : 220V/50Hz
2.	Other Features: <ul style="list-style-type: none">• IVD conform• At set rpm" for even more reproducible results (Timer starts when set speed is reached)• Setting Of RPM/RCF, Time, and Temperature• Rotors should be high heat conductivity, should allow fast precooling and accurate temperature control in refrigerated centrifuge.• Frequency controlled induction drive system• Automatic rotor Recognition• Acceleration and Deceleration ramp• Condensation drain should be available to avoid corrosion formation in chamber.• Short spin & lid lock• Values can be change during centrifugation• Fast temperature function for rapid cooling of the centrifuge chamber• Imbalance cutout
3.	Rotors Fixed angle: 1. Capacity : 30x1.5/2ml Maximum speed : 14,000RPM RCF : 21,800xg Adaptors for 0.5ml, 0.2ml PCR Tubes 2. Capacity : 6x85ml Maximum speed : 12,000 RPM RCF : 18,500 g Adaptor for 15ml = 32 nos, 50ml = 16nos
4.	Swinging Bucket for tubes and Micro titer plates Capacity : 4x250ml Maximum speed : 4,200 RPM RCF : 3,200xg Adaptor for 16*15ml, 4*50ml falcon tubes. Standard Warranty (inclusive of spares, consumables, standards or glass parts etc.) of 24 months starting from date of satisfactory and faultless functioning of the equipment for 60 days at the respective laboratory premises. Comprehensive Maintenance Contract Service for 36 months after expiry of standard Guarantee/Warranty should be quoted.

Annual calibration of the equipment shall be a part of the CMC. It shall also be mandatory to perform calibration after every major repair/breakdown.
The vendor should guarantee the supply of all types of spares/accessories for the Instrument system for a minimum period of 10 years after the warranty period and CMC service.

ITEM NO: 8

ULTRA LOW TEMPERATURE FREEZER (VERTICAL TYPE)

SPECIFICATIONS

S. No.	Specifications
1.	<p>The Microprocessor Controlled Ultra low Temp. Freezer (Vertical type) should have the following features:</p> <p>Programmable Temp. Range upto -86°C in increment of 1°C, should work even at ambient temperature up to 32°C (Preferable).</p> <p>Display should be bright, digital LED characters $\frac{1}{2}$", 1.3cm high mounted at the eye level.</p> <p>Pull Down Time: 5.1 Hrs or less (Preferable)</p> <p>Power consumption: 525 watts/ 10.5 or less Kwh per day or less (Preferable)</p> <p>S.M.A.R.T Plus Diagnostic software: System Monitoring & Reporting Technology Software built – In for fault diagnosis or set point variance</p> <p>Polished 304L SS Interiors</p> <p>18 gauge steel, 1.2mm thick. Powder coated scratch and rust resistant.</p> <p>Two Pass-through Access Ports</p> <p>The system should be capable of holding 24,000 samples of 2ml vials</p> <p>Polyurethane foam Insulation and VIP (vacuum insulation panel)</p> <p>Heated air Vent with plunger to break icing and prevents vacuum formation.</p> <p>Battery Backup for the display activates alarms and displays temperature during power outages.</p> <p>4-digit password protection for temp. & alarm set-points.</p> <p>Lockable security plates.</p> <p>Five Compartments with four adjustable height SS shelves (Preferable)</p> <p>Door latch with Positive, single-handed cam action latch with lock.</p> <p>The Freezer should be provided with Audible and Visual Alarms facility for the indication of high and low temperature conditions, power failure, low battery and also Automatic Restart with non – volatile memory ,returns set points to user programmed levels after power interrupt.</p> <p>The capacity of 400- 500 liter and internal Dimension of 126.5 x 55 x 57.5 (H x W x D cm).</p> <p>The system should optional facility for CO_2 and LN_2 backup systems</p> <p>It should be CFC Free and HCFC free refrigerants with biodegradable oil compressor.</p> <p>The freezer should be CE and UL certified</p> <p>Standard Warranty (inclusive of spares, consumables, standards or glass parts etc.) of 24 months starting from date of satisfactory and faultless functioning of the equipment for 60 days at the respective laboratory premises.</p> <p>Comprehensive Maintenance Contract Service for 36 months after expiry of standard Guarantee/Warranty should be quoted.</p> <p>Annual calibration of the equipment shall be a part of the CMC. It shall also be mandatory to perform calibration after every major repair/breakdown.</p> <p>The vendor should guarantee the supply of all types of spares/accessories for the Instrument system for a minimum period of 10 years after the warranty period and CMC service.</p>

ITEM NO: 9

ROTARY EVAPORATOR

SPECIFICATIONS

S. No.	Specifications
1.	<p>Vertical Condenser One Evaporating Flask-1Ltr One Receiving Flask - 1 Ltr Lifting: Motor lift Height adjustment speed: 30mm/s Lifting Height adjustment: 155 mm Rotation speed : 10-280 RPM Rotation speed Setting : 4.3" LCD color graphic display Brushless DC motor with electronic speed control drive Heating capacity: 1300W Temperature range heating bath : 20-210°C Temperature Accuracy bath : ± 1k Bath temperature setting: 4.3" LCD color graphic display Heating Bath temperature control: electronic/ Digital Secondary overtemp cut off: 250°C Heating bath volume: 4.5ltr Integrated vacuum Controller:Required</p> <ul style="list-style-type: none">• Two-stage diaphragm pump made from chemicalresistantmaterial.• High suction capacity of 2.0 m3/h• vacuum of 7 mbar <p>Timer:Required Condenser type: Vertical Condenser Surface: 1200Cm² Chiller with operating Temperature range: -20°C to +130°C. Temperature control: ± 0.2°C. Standard Warranty (inclusive of spares, consumables, standards or glass parts etc.)of 24 months starting from date of satisfactory and faultless functioning of the equipment for 60 days at the respective laboratory premises. Comprehensive Maintenance Contract Service for 36 months after expiry of standard Guarantee/Warranty should be quoted. Annual calibration of the equipment shall be a part of the CMC. It shall also be mandatory to perform calibration after every major repair/breakdown. The vendor should guaranteethe supply of all types of spares/accessories for the Instrument system for a minimum period of 10 years after the warranty periodand CMC service.</p>

ITEM NO: 10

WATER PURIFICATION SYSTEM

SPECIFICATIONS

S. No.	Specifications
1.	<p>Dedicated Water Purification System for type-I and Type-II water, including pre-filtering, RO, Uv lamp, Ultrapure Filters, reservoir tank, double independently operable dispensers for laboratory work. The feed water will be tap water Installation and training free of costs.</p> <p>To guarantee compliance with minimum laboratory safety requirements, and to ensure that the water purification system meets internationally-recognized safety norms, the water purification system shall be listed with Underwriters Laboratories (both UL and ULC), and will carry the CE mark, indicating compliance with European Union EC Directives.</p>
2.	<p>Details of technical specification for Integrated Ultrapure Water Purification System</p> <p>Two stage independent bench top system capable of producing both general laboratory usage water (Type-II) and highly pure water (Type-I) for high precision analytical and molecular biology work. The system should be capable of taking the below feed water quality:</p> <p>Feed Water Quality: Potable Tap water</p> <p>Conductivity:<2000 micro S/cm</p> <p>Temperature:5-35 deg C</p> <p>Fouling Index(SDI): <12</p> <p>Total Chlorine:<3ppm</p> <p>Minimum Feed Water Pressure:1.0 Bar(15 psi)</p> <p>Maximum Feed Water Pressure:6.0 Bar (90 psi)</p>
3.	<p>Pre-filter:</p> <p>Filtration with membranes and/or activated carbon capable of removing particles, Iron etc. (Customization is preferred after checking the feed water quality), Pre-filtration unit has to be supplied with 10,5 & 1 micron filters.</p> <p>Pumping system for inlet water:</p> <p>DC pump with inlet filtration screen</p> <p>Automatic pressure cut off</p> <p>>80 L/hour pumping speed</p> <p><50 decibel noise level</p> <p>Purification Modules (Product water type II):</p>

Type-II water purification system should consist of pre-treatment cartridge ;thin film membrane based RO system (single/double module) with high rejection rate (>99% salt);UV lamp(254nm); and EDI technology capabilities

Susceptible to low fouling and self-cleaning mechanism

Temperature compensation for UV based germicidal component

Should remove metal ions and particles both at low and high pH values programmable flow rate

Clear display of temperature, TOC level, conductivity

Product water should meet the following quality criteria:

R.O flow rate should be minimum of 10 ltr/hour.

Particulates.....<0.22µm (mL)<1

TOC (ppb).....<30

Bacteria.....<1 cfu/ml(with remote dispensing arm)

Resistivity.....10-15 Mega Ohms

To maintain optimum water purity and preventing deterioration during periods of non-use, Type-II system should have recirculation facility through UV-lamp and EDI to maintain the water quality in reservoir > 10 Mega Ohms all the time.

Reservoir:

Separate reservoir of 50-60L capacity with water level indicator and automatic water cut off once filled. With appropriate vent filter to avoid any type of secondary contamination through atmosphere.

Ultra-purification module (Type-I water for high precision work)

UV light(185/254nm) based germicidal, specific cartridges to remove organic and inorganic contaminants, TOC display monitor for accurate measurements (1-999 ppb), Water production unit that can be placed on the bench.

The ultrapure water system delivery unit should have dispense ultrapure water in four modes easily accessible: variable flow, Auto Volume, locked and hands free dispensing with optional foot pedal.

The ultrapure water system delivery unit should be designed so that regular lab containers, such as cylinders and flasks, can be filled without the need to hold them. The system will also incorporate an Auto Volume dispensing function capable of automatically dispensing of ultra-pure water from 100ml up to 60L.

The water purification system will have the ability to capture data via USB or external printer for system performance validation.

Product water should meet the following quality criteria:

Particulates <0.22 µm (/mL)<1

TOC (ppb).....<5

Microorganisms (cfu/mL).....<1

Pyrogen Levels (EU/mL).....<0.001

RNase Level (ng/mL).....<0.01

DNase Level (pg/µL).....<4

Water Resistivity (MΩ.cm at 25°C).....18.2

Independent Dispensing Unit:

Attached suitable filter at Point of delivery unit to remove particulate materials and microorganisms (0.22 µm pore size filters), Option of connecting 2 units with the main water producing unit.

Adjustable, rotating unit with multi-color display screen indicating TOC, Resistivity, flow rate, water level, alarm etc. to be directly accessible from the point of delivery unit.

Maintenance:

To avoid maintenance errors and to improve traceability, the internal primary consumable water purification cartridges will have a built-in RFID tag

To comply with Standard requirements, the resistivity meter should be able to display the non-temperature-compensated resistivity.

To prevent deterioration of water quality during periods of non-use, the ultrapure water system will be able to recirculate water to maintain high water quality.

The water system will incorporate a built-in Quick Reference Guide for immediate understanding of the main operations.

Warranty:

Standard Warranty (inclusive of spares, consumables, standards or glass parts etc.) of 24 months starting from date of satisfactory and faultless functioning of the equipment for 60 days at the respective laboratory premises.

Comprehensive Maintenance Contract Service for 36 months after expiry of standard Guarantee/Warranty should be quoted.

Annual calibration of the equipment shall be a part of the CMC. It shall also be mandatory to perform calibration after every major repair/breakdown.

The vendor should guarantee the supply of all types of spares/accessories for the Instrument system for a minimum period of 10 years after the warranty period and CMC service.

FORMATS FOR BIDS

FORMAT OF THE TECHNICAL BID:

1. Name of the Equipment:.....
2. Model:.....
3. Specification and cost:

S. No.	Main Heads/ Components	Specifications Given in the tender	Specification of the Quoted Model	Deviations, if any.	Additional features, if any

4. Undertaking

I (Name of the person) Authorized signatory of M/S (Name of the firm) hereby agree to all the term and conditions. JNTUK in its own discretion can cancel /modify the tender process and will have the right to accept or reject any or all Bids and to annul the qualification process at any stage without any liability or any obligation for such acceptance, rejection or annulment, without assigning any reasons

Name:

Signature:

Date:

Seal:

FORMAT FOR FINANCIAL BID:

1. Name of the Equipment:.....
2. Model:.....
3. Specifications and cost:

S. No.	Main Heads/ Components	Specifications Given in the tender	Specification of the Quoted Model	Cost in INR

4. Undertaking

I (Name of the person) Authorized signatory of M/S (Name of the firm) hereby agree to all the term and conditions. JNTUK in its own discretion can cancel /modify the tender process and will have the right to accept or reject any or all Bids and to annul the qualification process at any stage without any liability or any obligation for such acceptance, rejection or annulment, without assigning any reasons

Name:

Signature:

Date:

Seal: