File No. 12015/02/2017-QA
Food Safety and Standards Authority of India
(A statutory Authority established under the Food Safety and Standards Act, 2006)
(Quality Assurance Division)
FDA Bhawan, Kotla Road, New Delhi – 110002

Dated, the 02nd Jan, 2018

RFP No. 05/2017-18 FOR PROCUREMENT OF MINOR EQUIPMENTS: CORRIGENDUM

Further to this office Tender Enquiry No. 05/2017-18 dated 07th December 2017 and Pre-Bid conference held on 21st Dec 2017.

2. The following amendment are made in the ibid tender:

(a) Last Date and Time for Receipt of Tenders: **23 Jan 2018 at 1500hrs**

(b) Date and Time of Opening of Tenders: **23 Jan 2018 at 1530hrs**

(c) Part II- Essential Details of items/services required is **revised** as under:

1. **Schedule of Requirements** – List of items/services required is as follow :-

Sl. No	Items	Qty (Nos)	Purpose
1.	**Atomic Absorption Spectrophotometer [GTA /FLAME / VGA]**	01	For trace metal analysis in food and water
2.	**Lovibond Tintometer**	01	For sesame oil / Color in oil tests
3.	**Flame Photometer**	01	For minerals viz. Na, K, Ca.
4.	**Muffle Furnace**	02	For determination of Ash
5.	**Gas Chromatograph with FID and ECD Detectors**	01	For analysis of Pesticides residues and other Food & Water related applications as per FSSAI requirements
6.	**Gas Chromatograph with NPD and Thermal Conductivity Detector(TCD) Detectors**	01	
7.	**Microwave Digestion System**	01	For sample preparation prior to metal analysis by AAS
8.	**Digital BUTRYO Refractometer**	01	For BR, RI, Brix measurements in Oils and Fats
9.	**Flash point apparatus**	01	For flash point determination in refined Oils
10.	**Water Purification System**	01	For lab. HPLC Grade / AAS grade water generation

Note 1 : The bidders has to quote for all the items mentioned above. In Case bidder fails to quote for all the items mentioned above his bid will not be considered for evaluation. Consortium is allowed as a single entity or a subsidiary.

Note 2 : Necessary Civil/Electrical work required for installation of equipment's mentioned above shall be carried out by the successful bidder.

2. Revised Technical Details:

REVISED *SPECIFICATIONS*

Sl.No	Item	Specifications

1.	**ATOMIC ABSORPTION SPECTROPHOTMETER [GTA /FLAME / VGA]**	• Atomic Absorption Spectrophotometer (GTA/FLAME/VGA), Computer Controlled with built-in flame emission mode, Unit for Flame (Air Acetylene and nitrous oxide- acetylene), Graphite Tube Atomizer (GTA), Chiller / Water circulating unit, Auto samplers for GTA and flame
		• Wave length range 190 – 800 nm wave length
		• Sensitivity at least 0.9 abs for 5µg/ml aqueous copper standard solution with air – acetylene flame
		• Optics: Double Beam dual blazed / holographic Czerny turner Monochromator
		  • Focal length At least 250 mm focal length
		  • Resolution 1800 lines / mm
		  • Width Automatic bandwidth of 0.2 to 1.0 nm
		• Flame Atomizer: All titanium or equivalent burner with impact bead / Flow spoiler, premix Design
		  • Movement Automatic movement into the sample compartment
		  • Affect from Acids /Organic solvent Unaffected from attacks by acid solution or organic solvents (e.g. Methyl isobutyl Ketone i.e. MIBK
		  • Flame Alignment in liquid beam Fully automatic, optimized with motorized burner mount for vertical and horizontal burner adjustment
		  • Nebulizer High precision able to provide manually adjustable uptake rates material of the nebulizer and related Venturi should be inert to acid solutions and organic solvents such as MIBK
		• Flame Control Computer controlled ignition
		• Gas Control Computer controlled with oxidant and fuel gases monitoring to monitor constant fuel / oxidant ration ignition
		• Safety Function Interlocking system to prevent ignition
		• Essential Interlock Monitor Burner type as well as its presence in position, air selector, flame sensor, liquid trap level, gas supply pressure and air supply anywhere in the network of gas tubings in the system
		• Automatic Lamp Selection Function Computer controlled Hollow Cathode Lamp selection and alignment Lamp Holder At least 8 lamp holder with built in power supplies for hollow cathode lamps

Sl.No	Item	Specifications
		and electrode – less discharge lamps or equivalent Operating Parameter setting Automatic Setting • Read Out /Display Display facility for absorbance as well as concentration, Display of errors or error codes, absorbance range at least up to 2.0 Abs. • Scale Expansion Scale expansion at least up to 100x • Integration time Integration time should cover at least 0.2 to 50 seconds range • Measurement Measurements of mean, RSD and CV, Background only mode, Integration of peak height and peak areas. • Accessories / Spares with Flame AA System • Vapour Generation Assembly: Should be continuous flow based hydride / mercury vapour generator with option of using with or without a programmable auto sampler • Precision Precision of better than or at least 1% at ppb levels of mercury, arsenic etc. • Absorption Cell The absorption cell's material should have no effect of the high heat of the flame and the cell for the analysis of mercury should be of a closed cell design • Flame Arrester Flame arrester should be provided in the tube which connects the assembly to the absorption cell • Cell Design holder. The design of the cell holder should give a firm and easily adjustable (for alignment) mounting on the burner head. • System accessories Complete with necessary reagent bottles, connectors etc. • Hollow Cathode lamps 16 hollow cathode lamps. One lamp each for the elements: Arsenic, Antimony, Boron, Calcium, Chromium, Cobalt, Copper, Iron, 19 Nickel, Lead, Manganese, Mercury, Selenium, Tin, Vanadium and Zinc. Equivalent coded lamps will also be acceptable. • Air Compressor with Air Filter or equivalent Air Service Unit Complete with pressure regulator quite in operation, necessary tubing and connectors and should meet the air supply requirements of AAS operation. Oil Free Pump Oil- free pump and moisture trap Corrosion Resistant Resistant to acidic vapour and the drain value (if any) should be

Sl.No	Item	Specifications
		made of stainless steel of equivalent corrosion resistant material • Gas Regulators Nitrous – oxide gas regulator Nitrous Oxide Gas regulator (two stage) with heater, with necessary tubings and connectors. Necessary transformer should be provided to transform this supply to the requirements of the heater. The heater should work on 230±10volts 50 Hz AC power supply. Acetylene Gas regulator Acetylene gas regulator (two stage) with necessary tubing and connectors. Nitrogen Gas regulator Nitrogen regulator (two stage) with necessary tunings and connectors. • Graphite Furnace System: • Graphite Tube: Atomizer Should be computer controlled fully enclosed graphite tube system consisting of stabilized temperature / total pyrolytic graphite plate form. • Gas Supplies: Provision of two gas supplies (programme selectable) with independent control over the gas supply through the furnace. • Heating Rate: Heating rate of at least 2000°C per second Cooling Time • Cooling time: 20 seconds • Temperature Range: Temperature range ambient to 2600°C or more in 1°C increments Feed back system • Feed back system for furnace temperature control, interlocks for water, gas, temperature, furnace door, graphite tube damage and mains power. • Temp. Programming: At least eight steps temperature programming facility with flexibility of programme selection, ramp time, gases, gas flow and read trigger for 20 each temperature step. • Control: Computer controlled with appropriate provision for print out of the furnace and sample parameters • Display: Calibration data / graphs, temperature profiles, signal graphics and the instrument status. • Memory: Memory should be able to store at least ten non volatile programmes • Ciller / Cooling Water Re-circulation Unit: Refrigerating water circulation unit of appropriate capacity. No discharge of water from this water circulation unit. • DATA WORK STATION

Sl.No	Item	Specifications

		• Application Software:
		  • Programme facility with multitasking software
		  • Should provide complete control of instrument with instrument status display and its various accessories.
		  • Provide accurate and reproducible time averaged, integration, non – averaged integration, multi level calibration.
		  • Software should handle instrument linear absorbance reading, concentration, or emission intensity, integration time, built-in statistics, calibration equation control, slope of analytical curve using operator selective calibration standard
		  • Built-in interface for computer connection and use of optional accessories.
		  • Comprehensive quality control protocols facility including blank, multiple quality control standards, QA/QC audit trail and calibration failure.
		• Computer System:
		  • Make: Reputed brand such as HP/Compaq/IBM/ Dell
		  • Processor: Intel core 2 duo processor 3.00 GHz or above
		  • RAM: 4 GB (upgradable up to 8 GB) HDD 500 GB ultra DMA or higher HDD (7200 RMP)
		  • Monitor: 21” TFT – LCD Flat Colour
		  • CD ROM: 52X CD- ROM
		  • DVD-CDRW: 32X DVD-ROM and CDRW – combo Drive Max speed 48x24x48
		  • Ports: 2 serial, 1 parallel and 2 USB front 6 rear USB2 PS/2 Port, 1 VGA integrated Port 1line in/out port
		  • Key Board: 104 keys
		  • Mouse: Optical mouse with pad
		  • Ethernet: 32 bit auto selectable 10/100 MBPS
		  • Graphics: Internet ready with integrated graphics
		  • Sound: Integrated sound card and inbuilt stereo speakers
		  • Printer HP Laserjet Printer 1200 x 1200 dpi 12 PPM black
		• Operation Software:

Sl.No	Item	Specifications
		• Preloaded Windows XP Professional operating system with Licensed CD • MS Office 2000 Standard with media, manual and Licensed CD • Preloaded Antivirus with latest version along with Licensed CD • ADDITIONAL ITEMS • Operation Kit: Manufacturers Standard Operation Kit including all required items, tubings, fittings for start up / regular operation of instrument. • Operation / maintenance: Manual Operation / maintenance Manual for each unit Analytical manual • Analytical manual: including applications for flame, VGA and graphite system Service Manual • Service manual: with one set of required tools for each system / unit • Trouble Shooting Charts, Spare parts Catalogue, Application Notes for trace metal analysis in food and water samples • Dust Cover One for each unit • Consumables: For three years operation for each of the following units: Flame AAS (basic unit, burner system) Vapour generation assembly Graphite Furnace Atomizer Auto sampler • Operation and Maintenance Training: Two weeks training to be provided to two scientist on software training, operation, maintenance and troubleshooting aspects of instrument. • General Conditions of Supply • The instrument and all its units should operate on 230 ±10 volts 50Hz power supply • All the operation and maintenance manuals, circuit diagrams, application notes and application softwares to be supplied should be in English Language. • The supplier / manufacturer should have Indian Agent to provide after sales service. • The main unit and all the sub units of the instrument should be serviced by the Indian representative of supplier. • The Bidder should be a manufacturer / authorized representative of a manufacturer, who must have designed, manufactured, tested and supplied two numbers of such equipment similar to the type specified in the past five years, which shall be in successful operation for at least 2 years as on the date of bid opening.

Sl.No	Item	Specifications
		• The bidder should furnish the information on past supplies and their satisfactory performance. • Bidders shall invariably furnish documentary evidence (client's certificate – at least two) in support of the satisfactory operation of the equipment as specified above. • Notwithstanding anything stated above the purchaser reserves the right to assess the capability and capacity of the bidder to perform the contract, should the circumstances warrant such an assessment in the overall interest of the purchaser. • Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered. • Buy-back price for old Atomic Absorption Spectrophotometer [Make: GBC Scientific Equipments, Australia, Model: Avanta PM and System AVANTA ULTRA Z1 & PAL4000 Auto-sampler Year of Installation: 2001] may also be quoted
2.	**LOVIBOND TINTOMETER**	• Measuring principle: Visual, in terms of Lovibond® units • Modes: Transmittance, reflectance Range 0.1 - 79.9 Red, Yellow; 0.1 - 49.9 Blue; 0.1 - 3.9 Neutral • Resolution: 0.1 Lovibond® unit • Optical system: 11 glass-filled nylon racks containing a graduated range of Lovibond® colour glasses • Viewing system Fully adjustable, prismatic with integral blue filter for light standardization • Light source 2 x 12 Volt, 10 Watt tungsten halogen lamp Illuminant approximates to daylight • Path length Up to 153 mm (6") • Power pack 12 Volt ac, switchable to suit 220/110 Volt supply Approvals CE Instrument housing Fabricated sheet steel with a tough, textured paint finish • Conformance filters and certified colour reference solutions representing a range of Lovibond® colours, for quick and simple quality control checks on instruments and operators. • Certifications: • Product certification: CE / US FDA / BIS certified. • Quality Certification: ISO certified. • Should provide calibration certificates from NIST traceable agencies during warranty & CMC period. Calibration cost will have to be borne by the supplier.

Sl.No	Item	Specifications
		• DQ, IQ, OQ, PQ Documentation during installation. • For validation vender should having it own capability with their own company trained service engineer to perform validation. No third part validation will be entertained. One validation at the time of installation should be done by company personnel. • Warranty: Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered. • Buy-back price for old Digital Lovibond Tintometer [Make: Tintometer Ltd., U.K. Model: PFX 995 Year of Installation: 2003] may also be quoted

3.	**FLAME PHOTOMETER**	• Range Na+: 0 to 199.9 ppm, K+: 0 to 9.99 ppm, Li+: 0 to 9.99 ppm
		• Sensitivity 0.1 ppm Na+; K=100 units
		• Specificity less than 0.5% interference when concentrations are equal to test sample concentrations
		• Reproducibility less than 0.5% C.V.
		• Linearity less than 1%
		• Display dual display; 3-1/2-digit LED, 12.5 mm (1/2")
		• Fuel supply high-grade propane/butane mixture regulated at approximately 30 psi
		• Air supply 6 liters/min at 12 psi; oil and moisture free
		• Recorder output 0.05 to 5 V (switchable)
		• Certifications:
		  ◦ Product certification: CE / US FDA / BIS certified.
		  ◦ Quality Certification: ISO certified.
		  ◦ Should provide calibration certificates from NABL accredited agency every year during warranty & CMC period. Calibration cost will have to be borne by the supplier.
		• Equipment should be FDA / CE certified or equivalent standard of repute. It should be ISO 9001:2000 or other equivalent quality certification.
		• All electrical peripherals required for smooth functioning e.g. voltage stabilizer should be provided with the equipment.
		• Warranty: Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.

4.	**MUFFLE FURNACE**	• 1200 degree with 23 liter capacity or more • Double Shell case, Stainless Steel • High Purity insulation material with efficient low thermal insulation • Bench top model

Sl.No	Item	Specifications
		• Vertically lift break switch/side lift break with front loading • Door: positive break switch Inside • Chamber Size: 245-280 mm x 340-400 mm x 230-250 mm (WDH) • Maximum temperature: 1200^{o}C Standard continuous temperature 1050 ^{o}C or more • Heating Rate: The furnace should be fast heating type with maximum attainable temperature should reach in 110 mins or better • Temperature control: Should be microprocessor based & at least 8 segment programmable 3216P1 or equivalent controller with necessary safety features. Programmable Temperature controller with heating rate control from 10 deg. min-1 to 100 deg.min-1 preferable • Temperature Accuracy: ± 5^{o}C over the whole temperature range of operation and in the entire muffle • Safety: Over Temperature protection should be added • Gas purging: Gas purging facility (inert gas inlet and outlet) • Weight : less than 80 kg • The furnace should be CE certified with suitable power supply • Installation, training and commissioning: Vendor must ensure satisfactory installation and commissioning of the system at CFL, Kolkata. A detailed training on handling, operation and applications must be provided to at least 5 scientists. Installation services must include IQ/OQ/PQ • For validation vender should have its own capability with their own company trained service engineer to perform validation. No third part validation will be entertained. One validation at the time of installation should be done by company personnel. • Warranty: Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered. • Buy-back price for old Muffle furnace [Make: Heraeus Instrument, Germany, Model: M110, Year of Installation: 2000] may also be quoted
5.	**GAS CHROMATOGRAPHY WITH FID AND ECD DETECTORS**	• Pesticides residues and other Food & Water related applications as per FSSAI requirements • Gas chromatograph with capability of operating concurrently with two injectors or better and three detectors. The system should be quoted with all accessories required to make it fully operational and any other item required for stated applications be quoted as optional.

Sl.No	Item	Specifications
	Oven	• Upto 450 °C, Fast Oven with 120 °C/min ramp, ≥~~20~~≥7ramps • Cool-down time from 450 °C to 50°C within 5 minutes • Should be able to accommodate two or more injectors and three detectors • Automatic leak test of system through single key
	Pneumatic Controls	• 0-140 psi or better, all Electronic Pneumatic Controls with 0.1 psi precision
	Injector (2 or more)	• Should be capable of large volume injection Temperature ramped splitless, Split and Cold on-column modes ≥450 °C max. and ≥10 ramps. • Multimode/PTV with 250µL or better Injection Volume capability with complete solvent vaporizer system or Equivalent. • Injector must be able to operate with capillary & wide bore columns • Injector must be provided with Backflush system.
	Autosampler (Liquid and Headspace)	**Robust Liquid autosampler** capable of injecting ≥100 samples or better with syringe capacity of 0.5-100 µl • The type and volume of the syringe must be automatically detected by the system. • Must allow installation and automation of syringe featuring volumes from 0.5 to 100 µl. • Must be able to achieve combined multiple solvent rinsing with upto 4 different solvents. **Head space auto sampler** with a capacity ≥50 vials or better that support 10 & 20ml vial capacity with Pnuematic control • Incubation Oven Temperature Range 50 to 200 °C in 1 °C steps • Syringe Temperature 50 °C to 150 °C in 1 °C steps • Incubation Oven Capacity vials or better
	Detectors	• The GC must have complete integrated control of all parameters (no external control module) for the following detectors: FID, and ECD. • Detector must be independently controlled and operational for maximum sensitivity
	Flame Ionization Detector (FID	• Linear range : better than 10^7 • Minimum detectable amount with makeup gases : 1.5 pgC/sec • Operating temperature limits: 450°C with standard ceramic/quartz flame jet • Auto flame out detection. • Acquisition rate 50 Hz or more.
	Electron Capture Detector ECD	• Linear dynamic range : better than 10^4 • Complete with ^{63}Ni source and low voltage heaters.

Sl.No	Item	Specifications
		• Minimum detectable amount: Less than 10 fg of lindane. • Operating temperature limits : 400^{o}C
	Gas Supplies	• Required High purity Gas cylinders (2 No. Each)
	SOFTWARE AND HARDWARE (Single point control of Software & Hardware)	
	Software	Complete system and software configuration must be 21 CFR Part 11 compliant. Software: Windows Based software with multitasking and capable of performing the following functions: Control the MS, acquire, store, process and reproduce the data. It must be able to control all the devices from same software. Software should allow monitoring of one molecular ion and upto four confirmatory ions. Quantification software for batch process must confirm the analytes as per regulatory requirements in food and environmental sample analysis as per the applications specified.All Flow Controller i.e. Carrier flow, Make-up flow, Hydrogen flow, Air flow etc. value should set through Software by PC.Head Space Auto Sampler, Automation and event control from PC through same software.IQOQ of the system as well as software must be provided. Software update upto five years
	Communication Hardware:	Latest Factory set, branded system with 22-23" Full HD Monitor with Printer - B/W - duplex - laser - Legal, A4 - 1200 dpi x 1200 dpi - up to 21 ppm – capacity with Network Card and Bluetooth facility.
	IQOQPQ	IQOQPQ of instrument and Software should be provided along with document.
	Training	Technical and application training to the personnel at site immediately after installation as per terms & conditions of tender.
	Application Support	The Application support for stated applications required during method development and validations.
	Pre Installation Requirements (PIR)	Provide PIR of the system**.**
	OTHER REQUISITES FOR GC WITH ECD, FID	
	Automatic Change Over Manifold for each gas line	
	Complete Gas Purification Panel with fittings & installation of all gases	
	Renewable In Line Gas Purification System	
	Renewable gas purifier cartridge, Spare Set	
	Gas clean filters/Traps (6 No.)	
	Septa for injectors	Non stick, Low bleed, high puncture tolerance and Max. Temp 400 ^{o}C (*for each injector*). (400 No.)
	Liners	• Suitable Ultra Inert Injector Liner for SS & SSL (20 No.) • Suitable Injector Liner upto 10 µL (6 No.) • Suitable Injector Liner upto 250 µL (6 No.) • Suitable Injector Liner upto 500 µL (6 No.) • Liner O-Rings Max Temp 375 ^{o}C (100 No.)

Sl.No	Item	Specifications
		• **Liners types required as per the application**
	Ferrules and Nuts	50 No. (for each column end and other interfaces as applicable), 50 No. for GC with ECD, NPD, FID
	Columns for GC Applications	• Pesticide column (30m x 0.250mm x 0.25µm (HP-5MS / DB-1MS or equivalent) (02 no.) • Column for Fatty Acid Profiling with main concern of Trans Fatty Acid Application (02 No.) • Column for Cholesterol Application (02 No.)
	Vials, caps and tool for autosampler *(Only Compatible sizes should be supplied)*	• 2000 No. each Vial sets (1, 2 mL, Crimp type, Amber and Clear glass) • 200 No. Vials (10,20ml Crimp type with cap & septa) • 1000 No. 300/500 µL Recovery vials • 6000 No. Septa PTFE/Silicone (for 1, 2 mL Vials) • 6000 No. Septa PTFE/Silicone (for 10, 20 mL Headspace Vials) • Ergonomic Crimping Tools for different vial types • Ergonomic Decapping Tools for different vial types • 10 No. each Storage Racks for (for 1, 2 mL Vials) • Head Space vials 10,20 ml capacity (500no. each)
	Autosampler Syringe	10 µL (12 No.), 100 and 250 µL (04 No. each); Manual syringe-2µl, 5µl and 500 µl (04 No. each). Headspace syringe (02 no.10µl, 500µl,02 no. 1ml)
	Sample Preparation *(Water & Food)*	QuEChERS Kits for Pesticides and Herbicides in following Matrices: • Water (1000 No.) • Matrices with high fat (1000 No.) • Matrices with high Water content and (1000 No.) • Matrices with high pigmented (1000 No.)
	Tools and Kits	Septa Removing tool
		Tubing Cutter with rotating diamond blade for column
		Tubing Cutter for stainless steel tubing (1/16 & 1/8 inch tubing)
		Tubing Cutter for Plastic tubing with spare blade set
	Miscellaneous	Consumables required for each detector must be provided
	Warranty	Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.
	Buy Back	Buy back price for old Gas Chromatograph - Mass Spectrometer (GC / MS) With Headspace (HS) sampler, ECD, FID and Single Quadruple MS detector [Make: Perkin Elmer USA Model: Clarus® 500, Year of Installation: 2006 may also be quoted.
6.	**GAS CHROMATOGRAPHY WITH NPD AND THERMAL CONDUCTIVITIY DETECTOR(TCD) DETECTORS**	• Pesticides residues and other Food & Water related applications as per FSSAI requirements • Gas chromatograph with capability of operating concurrently with two injectors or better and three detectors. The system should be quoted with all accessories required to make it fully operational

Sl.No	Item	Specifications
		and any other item required for stated applications be quoted as optional.
	Oven	• Upto 450 °C, Fast Oven with 120 °C/min ramp, ~~≥20~~≥7ramps • Cool-down time from 450 °C to 50°C within 5 minutes • Should be able to accommodate two or more injectors and three detectors • Automatic leak test of system through single key
	Pneumatic Controls	• 0-140 psi or better, all Electronic Pneumatic Controls with 0.1 psi precision
	Injector (2 or more)	• Should be capable of large volume injection Temperature ramped split-less, Split and Cold on-column modes ≥450 °C max and ≥10 ramps. • Multimode/PTV with 250µL or better Injection Volume capability with complete solvent vaporizer system or Equivalent. • Injector must be able to operate with capillary & wide bore columns • Injector must be provided with Backflush system.
	Autosampler	**Robust Liquid autosampler** capable of injecting ≥100 samples or better with syringe capacity of 0.5-100 µl • The type and volume of the syringe must be automatically detected by the system. • Must allow installation and automation of syringe featuring volumes from 0.5 to 100 µl. • Must be able to achieve combined multiple solvent rinsing with upto 4 different solvents.
	Detectors	• The GC must have complete integrated control of all parameters (no external control module) for the following detectors: NPD, and TCD. • Detector must be independently controlled and operational for maximum sensitivity
	Nitrogen Phosphorus Detector (NPD)	• Minimum detectable amount: 100fg N/sec, 100fg P/sec • Linear dynamic range: better than 10^4 • Operating temperature limits: 450 °C with standard jet
	Thermal Conductivity Detector TCD	• Capillary-column compatible • Proven constant current design • Software protection to prevent filament burnout • Ideal for series operation • 1/8-in. fittings • PPC pneumatics - software flow control of reference gas • Operating temperature 100 °C to 350 °C in 1 °C increments

Sl.No	Item	Specifications
		• Sensitivity 9 µV/ppmnonane at 160 mA at the bridge with a detector temperature of 100 ˚C or 100 pgtridecane, /mL with He • Minimum detectable quantity Typically < 1 ppm nonane • Linear dynamic range: better than 10^5 +/- 5% • Operating temperature limits: 400 °C
	Gas Supplies	• Required High purity Gas cylinders (2 No. Each)
	SOFTWARE AND HARDWARE (Single point control of Software & Hardware)	
	Software	Complete system and software configuration must be 21 CFR Part 11 compliant. Software: Windows Based software with multitasking and capable of performing the following functions: Control the MS, acquire, store, process and reproduce the data. It must be able to control all the devices from same software. Software should allow monitoring of one molecular ion and upto four confirmatory ions. Quantification software for batch process must confirm the analytes as per regulatory requirements in food and environmental sample analysis as per the applications specified.All Flow Controller i.e. Carrier flow, Make-up flow, Hydrogen flow, Air flow etc. value should set through Software by PC.Head Space Auto Sampler, Automation and event control from PC through same software.IQOQ of the system as well as software must be provided.
		Software update upto five years
	Communication Hardware:	Latest Factory set, branded system with 22-23” Full HD Monitor with Printer - B/W - duplex - laser - Legal, A4 - 1200 dpi x 1200 dpi - up to 21 ppm – capacity with Network Card and Bluetooth facility.
	IQOQPQ	IQOQPQ of instrument and Software should be provided along with document.
	Training	Technical and application training to the personnel at site immediately after installation as per terms & conditions of tender.
	Application Support	The Application support for stated applications required during method development and validations.
	Pre Installation Requirements (PIR)	Provide PIR of the system.
	OTHER REQUISITES FOR GC WITH NPD, TCD	
	Automatic Change Over Manifold for each gas line	
	Complete Gas Purification Panel with fittings & installation of all gases	
	Renewable In Line Gas Purification System	
	Renewable gas purifier cartridge, Spare Set	
	Gas clean filters/Traps (6 No.)	
	Septa for injectors	Non stick, Low bleed, high puncture tolerance and Max. Temp 400 ºC (*for each injector*). (400 No.)
	Liners	• Suitable Ultra Inert Injector Liner for SS & SSL (20 No.)

Sl.No	Item	Specifications
		• Suitable Injector Liner upto 10 µL (6 No.) • Suitable Injector Liner upto 250 µL (6 No.) • Suitable Injector Liner upto 500 µL (6 No.) • Liner O-Rings Max Temp 375 ^{o}C (100 No.) • Liners types required as per the application
	Ferrules and Nuts	50 No. (for each column end and other interfaces as applicable), 50 No. for GC with ECD, NPD, FID
	Columns for GC Applications	• Pesticide column (30m x 0.250mm x 0.25µm (HP-5MS / DB-1MS or equivalent) (02 no.) • Column for Fatty Acid Profiling with main concern of Trans Fatty Acid Application (02 No.) • Column for Cholesterol Application (02 No.)
	Vials, caps and tool for autosampler *(Only Compatible sizes should be supplied)*	• 2000 No. each Vial sets (1, 2 mL, Crimp type, Amber and Clear glass) • 200 No. Vials (10,20ml Crimp type with cap & septa) • 1000 No. 300/500 µL Recovery vials • 6000 No. Septa PTFE/Silicone (for 1, 2 mL Vials) • Ergonomic Crimping Tools for different vial types • Ergonomic Decapping Tools for different vial types • 10 No. each Storage Racks for (for 1, 2 mL Vials)
	Autosampler Syringe	10 µL (12 No.), 100 and 250 µL (04 No. each); Manual syringe-2µl, 5µl and 500 µl (04 No. each).
	Sample Preparation *(Water & Food)*	QuEChERS Kits for Pesticides and Herbicides in following Matrices: • Water (1000 No.) • Matrices with high fat (1000 No.) • Matrices with high Water content and (1000 No.) • Matrices with high pigmented (1000 No.)
	Tools and Kits	Septa Removing tool
		Tubing Cutter with rotating diamond blade for column
		Tubing Cutter for stainless steel tubing (1/16 & 1/8 inch tubing)
		Tubing Cutter for Plastic tubing with spare blade set
	Miscellaneous	Consumables required for each detector must be provided
	Warranty	Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.
7.	**MICROWAVE DIGESTION SYSTEM**	A latest model of microwave digestion system should enable rapid digestion for different inorganic/organic samples like; Different types of FSSAI food and food products, Fish and Fishery products, tea, seasoning powder, biscuits etc.
	Application	A latest model of microwave digestion system should enable rapid digestion for different inorganic/organic samples like; Different types of FSSAI food and food products, Fish and Fishery products, tea, seasoning powder, biscuits etc•

Sl.No	Item	Specifications
	General	The instrument should have a superior pressure venting so as to prevent any loss of volatile metals and should have homogeneous microwave field to avoid sample burning
	System	Microwave digestion system should have temperature and pressure controlling/monitoring system. The system should be software controlled. Different types of rotors available for the digestion of the different type samples should also be quoted. Necessary consumables and maintenance parts should also be quoted to run instrument trouble free
	Instrument	The system should be a stand alone work station and should have • The System should have the feature of simply choose a method and it automatically recognizes the vessel type, counts the vessels and determines all of the parameters necessary for a fast, complete digestion • Should have provision that user can set the desired parameters for digestion • Should have Automatic Microwave power application depending on the load • Auto sensing of temperature and pressure inside the vessel • Be capable of processing different amounts of samples (from 0.3 g up to 10g) in the same run assuring the same conditions of temperature and pressure
	Display	The Instrument should have the high-resolution, colour touch screen, acid resistant, LED/LCD screen should serve as controller and display. Should be provided training videos for sample preparation vessel assembly, system use, and maintenance. Should have Data management – Easy access to stored methods, real-time data and results of past runs. Should be able to display the detailed methods, graphs o f temperature and power against time and temperature of individual vessels.
	Interlocks	The system should have good interlocking system for safety and cavity door.
	Vessel	The system should be high throughput which can hold atleast 24 high pressure vessels. Must be supplied with digestion vessel racks and suitably handle different digestion volumes.
	System	The material of construction should be high purity TFM fluropolymer. Vessel should be capable of handling volumes between 10 ml and > 25 ml, if required. It should be operated for maximum temperature capacity of 250ºC or more and maximum pressure of 35 Bar or more. The system should be provided with temperature sensor (Thermocouple type/ Fiber optics/IR Sensor)

Sl.No	Item	Specifications
		which will measure real temperature of the vessels and control it. The vessels should have automatic venting and re-sealing system in case there is excess pressure development essential. After Digestion, vessels must be vent-able before uncapping the vessel for safety reasons. For ease of use, the vessels must not require the use of an energizing tool in order to reform seals prior to operation. Additional twelve numbers of vessels should be supplied along with the system.
	Microwave Power and output with uniform energy distribution	The Instrument should have single/dual magnetron 1500 W (or more of delivered energy, should provide the temperature needed (300 °C) for difficult samples and high-throughput vessel sets delivering unpulsed continuous power & precisely tuned wave guide. Disperses microwave energy uniformly throughout the cavity. No need for motor driven diffusers or attenuators. System software must automatically adjust the power delivery based upon sample load and pre-programmed control settings. Automatic Power control Technology delivers maximum energy to the sample, ensuring complete digestions. Controllable via microprocessor 230 V input, pulsed and unpulsed-essential 50 Hz, AC Operated. The Instrument should have “waveguide” between the magnetron (the microwave energy source) and the cavity. This waveguide fed system should provide maximum tuned transfer of microwave energy from the magnetron to the load in the microwave cavity. planes. This should result in uniform heating of the sample load.
	Microwave Cavity	The microwave cavity should be heavy duty and have sufficient space to mount and dismount vessels individually and all parts inside the cavity should be totally microwave transparent. The Cavity should be constructed with non magnetic Rugged high-grade 316 solid steel cavity. The vessel assembly during a run should be visible from outside The coating inside the cavity should be acid/ chemical. resistant special polymer coating like fluro-polymer / PTFE.
	Controls	The Instrument should have a) Reliable Temperature and b) Pressure controls independent of each other • Automatic temperature control system, temperature sensor should be protected properly from any chemical attack, sensor should monitor and control all vessels simultaneously-essential • Automatic Pressure control: should have a pressure sensor which has a total capability of up to 500psi automatically control the pressure. It should be possible to remove the pressure device at a high pressure. The Vessels should act as self-regulators of pressure
	Control	The control terminal should have high resolution LED/LCD Acid Resistant display. Touch screen which

Sl.No	Item	Specifications
		should have method storage capacity. All the features should be in built in the software. Should have provision for manual programming storage apart from pre-installed programme. Continuous display of temperature and power inside the reaction vessels is required.
	Safety	There has to be multiple levels of safety. A safe mechanism to tackle the unused or reflected microwave energy Capable of shutting off in the event of the A very loud noise or bang in the instrument. If the temperature of the vessel is near its highest tolerance limit. Have inbuilt exhaust system to cool the vessels and to drive away if any fumes in the cavity-essential
	Quality Standards	The manufacturer should be ISO 9001 certified for design and manufacture of microwave digestion system
	Certification required for sign off	• IQ/OQ compliance • Calibration certificates for titrator • GLP-validated software for controlling the system
	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.
	Warranty	Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered. This will include yearly calibration start-up / commissioning routine servicing, regular maintenance, preventive maintenance of equipment and components and break down repairs as and when occurring, ensuring that system does not remain out of service for a period more than 24 hours in case of major breakdowns and 6-8 hour in the case of minor breakdowns due to any unforeseen break down. The institution will provide Water / Electricity power, etc. for maintenance work. The successful tenderer shall keep the essential spares at site during the Contract Period to avoid the delay in attending faults / maintenance.
	Service contract clauses, including prices	List of all spares and accessories (including minor) with part numbers and price, required for maintenance and repairs in future after guarantee/warranty period should be attached.
	Operating manuals, service manuals, other manuals	Should provide 2 sets (hardcopy and soft-copy) of:- • User, technical and maintenance manuals to be supplied in English language along with machine diagrams; • List of equipment and procedures required for local calibration and routine maintenance; • Service and operation manuals (original and copy) to be provided; • Advanced maintenance tasks documentation;

Sl.No	Item	Specifications
		• Certificate of calibration and inspection
	Certificates Performance and safety standards (specific to the device type);Local and/or international	• Should be FDA/CE/BIS approved product. • Manufacturer and Supplier should have ISO 13485 certification under ISO 9001for quality standards. • Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements (or equivalent BIS Standard) • Certified to be compliant with IEC 61010-1, IEC 61010-2-40 for safety
	Supplier/ Manufacturer	• Must be ISO certified for quality
	Service Support Contact details (Hierarchy Wise; including a toll free/landline number)	• Contact details of manufacturer, supplier and local service agent to be provided; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer;
	Recommendations or warnings	• Any warning signs would be adequately displayed
	Buy Back	Microwave Digestion System [Make: CEM Corp., USA Model: MARS 5, Year of Installation: 2008.
8.	**DIGITAL BUTRYO REFRACTOMETER**	For checking purity and adulteration of fats and oils
	System	Automated Operating LCD screen directly without manual alignment, can connect PC with RS232 interface
	Display	The required data to be displayed on the screen, including: the date, temperature, refractive index, concentration, and amended in accordance with the current temperature
	Measurement Range (Automatic Temperature Controlled)	• Concentration 0;95% • Refractive Index 1.32422－1.7000
	Minimum Indication	Butyro 0.1% RI 0.00001
	Measurement Accuracy	Butyro ±0.5% (at 40˚C) RI ±0.0003 (at 40˚C)
	Precision (Reproducibilty	RI ± 0.00005 Butyro ± 0.05
	Measurement Temperature	• 10 to 50˚C
	Ambient Temperature Sample	• 10 to 40˚C
	Volume Measurement Time	Less than 5 sec
	Sample Volume	> 0.1 ml
	Calibration certificate	
	Accessories	Reference Material Oil minimum 10 ml

Sl.No	Item	Specifications
	Operation and training component	• The supplier will have to carry out successful Installation at the laboratory premises (where ever the system has to be installed) and provide on – site comprehensive training for a minimum of two scientific personnel operating the system till customer satisfaction
	Certificates Performance and safety standards (specific to the device type);Local and/or international	• Should be FDA/CE/BIS approved product. • Manufacturer and Supplier should have ISO 13485 certification under ISO 9001for quality standards. • Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements(or equivalent BIS Standard) • Certified to be compliant with IEC 61010-1, IEC 61010-2-40 for safety
	Supplier/ Manufacturer	• Must be ISO certified for quality
	Service Support Contact details (Hierarchy Wise; including a toll free/landline number)	• Contact details of manufacturer, supplier and local service agent to be provided; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer;
	Recommendations or warnings	• Any warning signs would be adequately displayed
	Warranty	Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.
	Service contract clauses, including prices	• List of all spares and accessories (including minor) with part numbers and price, required for maintenance and repairs in future after guarantee/warranty period should be attached;
	Operating manuals, service manuals, other manuals	Should provide 2 sets(hardcopy and soft-copy) of:- • User, technical and maintenance manuals to be supplied in English language along with machine diagrams; • List of equipment and procedures required for local calibration and routine maintenance; • Service and operation manuals (original and copy) to be provided; • Advanced maintenance tasks documentation; • Certificate of calibration and inspection
	Buy Back	Buy back price for old Refractometer [Make: Bellingham Stanley, U.K. Model: RFM 330, Year of Installation: 1996 may also be quoted.
9.	**Flash point apparatus**	• Instrument designed in strict accordance with the test method ASTM D93, Method A and B. • Microprocessor controlled unit with digital easy to read display of the results. • Ignition :-Electric ignition and should also provide an automatic reignition facility. • Thermal detection (with metal sample temperature probe) of the flash to eliminate interference from water or silicone containing compound.

Sl.No	Item	Specifications
		• Cooling : - Facility for built-in cooling connection. • Automatic correction for standard barometric pressure vis-à-vis with final result. • Unit should have diagnostic program to check every key component and assembly and calibration facility. • Unit should automatically determine flash point in strict compliance with the appropriate test method. • Heating should be microprocessor controlled at the specified rate; the ignitor is activated and dipped at precisely the correct temperature and frequency. • Safety device for fire protection with alarm. • Resistance check box for temperature calibration with calibration certificate. • The unit should be operable on 230v / 50 Hz. • The system should be ISO 9001 quality standard and supplied with operation manual. • Merely copying our specifications in the quotation shall not make the parties eligible for consideration of the quotation. A quotation has to be supported with the printed technical leaflet/literature of the quoted model of the item by the quoting party/manufacturer and the specifications mentioned in the quotation must be reflected/supported by the printed technical leaflet/literature. • Calibration : The firm must ensure that the equipment supplied is fully calibrated as per specification requirements and also source of future calibration at New Delhi & their frequency of calibration needed • Spares : Vendor should quote recommended spares for two years alongwith the equipment for smooth functioning of the equipment. • Spare Parts : Availability of spare parts of the equipment/instrument must be guaranteed for a period of at least seven years from the date of supply. • After Sales Services: It should be clearly mentioned in the quotation whether the after sales services during and after the completion of warranty shall be provided directly by the supplier or their authorized agent/ representative. Terms of the after sales services, if any, may be mentioned in the offer. However, in both the cases the original supplier shall be responsible for poor performance/services. • Inspection: The inspection of the system will be done by our technical expert in the presence of firm representative. • Users List : The list of users specifically for the same model/make of the quoted item (not the list of general users) along with the complete name,

Sl.No	Item	Specifications

		address & contract numbers of the user organizations/persons may be submitted with the quotation along with the performance certificates from all/some of them.
		• Training: Our Scientist/Technical persons should be trained by the supplier at the project site free of cost. NOTE:- Firms having equipment wherein single mother unit can be used for carrying out Flash Point by Abel Flash Point using interchangeable analyzer unit shall be considered, if otherwise found suitable vis-à-vis price factor & performance. Other specification requirement for Abel Flash Point apparatus is enclosed.
		• Certifications:
		  • Product certification: CE / US FDA / BIS certified.
		  • Quality Certification: ISO certified.
		  • Should provide calibration certificates from NIST traceable calibration solutions by any agency every year during warranty & CMC period. Calibration cost will have to be borne by the supplier.
		• Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.
		• Buy-back price for old Automated Pensky-Martens closed-cup flash point tester with sample changer measures the flash point of up to 12 samples automatically [Make: Petrotest, Germany Model: PMA-4, Year of Installation: 2004] may also be quoted.

10.	**Water Purification system**	Table top Water Purification System (Tap Water Feed) should be capable of produce water for use in HPLC solvents, Microbiology and reagent grade with the help of pre-treatment module; RO Module, DI Module, Storage tank, UV Oxidation Chamber, Polishing module and final membrane filter 0.22um
	Pre-treatment System	Should consists: • 5 micron,1 micron and Activated Carbon wrapped type depth filter • Pressure gauge with regulator • The unit should have automatic low/high pressure cut-off
	Reverse Osmosis with Electro Deionization Stage:	▪ Pre-treatment cartridge with auto-scaling compounds, 0.5 micron filter and activated carbon or better. ▪ Prefilter combination to protect the RO Membranes life or better. ▪ RO Module with high performance thin film composite membrane with salt retention rate up to 98%. The retention rate for dissolved organic compounds, particles & colloids & bacteria exceeds

Sl.No	Item	Specifications
		99% ▪ Deionization Module: Mixed bed resin module utilized for a reduction of the inlet conductivity. Used for inorganic applications. ▪ Conductivity measurement is to be done after RO, DI & Polishing module to monitor the performance of Individual cartridge. ▪ Should have suitable back wash programme before every operation or better
	Storage Tank:	• 30 L or better Storage Tank with UV Lamp, Air filter, CO2 Trap & Level Sensor. • The tank should made of pure water resistant Poly Ethylene material with an outlet to drain the tank totally and a pressure sensor for the tank level control • The storage tank should be 100% drainable.
	General requirements	▪ Online UV oxidation chamber: UV Light Energy at 185 nm & 254 nm wavelengths. ▪ TOC Measurement: Online continuous TOC measurement with Live Display. ▪ Sterile Filter with 0.22 µm or better with Autoclavable option for re-use ▪ System should meet reagent water quality standards including ASTM Type 1, CLSI and ISO 3696 Type I ▪ System should have flexible remote dispenser to dispense water whenever needed ▪ System should have built-in automatic self-cleaning mechanism to extend the life of cartridge ▪ Automatic flushing and recirculation in standby mode to maintain consistent peak water purity ▪ User can collect RO Quality water from the Storage tank & ultrapure water from flexible dispenser ▪ Should have cartridge change indicator ▪ The system should incorporate a fully comprehensive, graphic colour LCD display to provide system status, performance parameters, routine maintenance status and alarms of troubleshooting, tank level status and automatic warning of reordering of consumables and ▪ Provision for digital display to indicate status of operation, resistivity or conductivity, temperature and also alarm system in case of malfunctioning.
	Pure Water Specification: (Type-2) •	• Production Rate : 10 LPH or better • Conductivity : <2µs/cm at 298K (25°C) or better • pH at 298K (25°C) => 6.6 or effectively neutral • Total silica max 3ug/L or better
	The Ultrapure Product Water should of the following specifications: (Type-1)	• Flow Rate : 1.0 L/min or better • Should have conductivity @ 25 Deg C : 0.055 µs/cm or better • Should have resistivity @ 25 Deg C : 18.2 MΩ-cm or better

Sl.No	Item	Specifications
		• TOC : < 1 ppb or better • Bacteria : <1 cfu/ml or better • Particles >0.1µm : <1 per ml or better • pH at 298K (25°C) = > 6.6 or Effectively neutral
	Certification required for sign off	• IQ/OQ compliance • Calibration certificates for titrator
	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.
	Warranty	Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered. This will include yearly calibration start-up / commissioning routine servicing, regular maintenance, preventive maintenance of equipment and components and break down repairs as and when occurring, ensuring that system does not remain out of service for a period more than 24 hours in case of major breakdowns and 6-8 hour in the case of minor breakdowns due to any unforeseen break down. The institution will provide Water / Electricity power, etc. for maintenance work. The successful tenderer shall keep the essential spares at site during the Contract Period to avoid the delay in attending faults / maintenance.
	Service contract clauses, including prices	List of all spares and accessories (including minor) with part numbers and price, required for maintenance and repairs in future after guarantee/warranty period should be attached;
	Operating manuals, service manuals, other manuals	Should provide 2 sets(hardcopy and soft-copy) of:- • User, technical and maintenance manuals to be supplied in English language along with machine diagrams; • List of equipment and procedures required for local calibration and routine maintenance; • Service and operation manuals (original and copy) to be provided; • Advanced maintenance tasks documentation; • Certificate of calibration and inspection
	Certificates Performance and safety standards (specific to the device type);Local and/or international	• Should be FDA/CE/BIS approved product. • Manufacturer and Supplier should have ISO 13485 certification under ISO 9001for quality standards. • Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements (or equivalent BIS Standard) • Certified to be compliant with IEC 61010-1, IEC 61010-2-40 for safety
	Supplier/ Manufacturer	• Must be ISO certified for quality

Sl.No	Item	Specifications
	Service Support Contact details (Hierarchy Wise; including a toll free/landline number)	• Contact details of manufacturer, supplier and local service agent to be provided; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer;
	Recommendations or warnings	• Any warning signs would be adequately displayed
	Buy Back	Buy Back price for old Deionized water generation system [Make: Millipore**,** U.S.A Model: ELIX 3, 10 AND MILLI Q, Year of Installation: 2008 may also be quoted.

6. Revised Eligibility Criteria for Pre-Qualification of bidders:

(a) Average Annual financial turnover, during the last three years should not be less than Rs. One Crore. Documentary evidence duly attested by a Chartered Accountant/Company Secretary should be submitted alongwith the Technical Bid. Bidders should also enclose notary attested copy of IT returns filed for the last three financial years, notary attested audited copy of audited accounts, balance sheet, annual report etc.

Note : There is no change from para 6(b) to 6(j).

REVISED TECHNICAL BID FORM (B)

The bids of only the technically qualified bidders will be eligible for consideration for opening of financial bid. The technical bid of the bidders will be evaluated on the basis of specification of the offered model vis-à-vis the prescribed specification given below :

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification

1.	**ATOMIC ABSORPTION SPECTROPHOTMETER [GTA /FLAME / VGA]**	• Atomic Absorption Spectrophotometer (GTA/FLAME/VGA), Computer Controlled with built-in flame emission mode, Unit for Flame (Air Acetylene and nitrous oxide-acetylene), Graphite Tube Atomizer (GTA), Chiller / Water circulating unit, Auto samplers for GTA and flame
		• Wave length range 190 – 800 nm wave length
		• Sensitivity at least 0.9 abs for 5µg/ml aqueous copper standard solution with air – acetylene flame
		• Optics: Double Beam dual blazed / holographic Czerny turner Monochromator
		  • Focal length At least 250 mm focal length
		  • Resolution 1800 lines / mm
		  • Width Automatic bandwidth of 0.2 to 1.0 nm
		• Flame Atomizer: All titanium or equivalent burner with impact bead / Flow spoiler, premix Design
		  • Movement Automatic movement into the sample compartment
		  • Affect from Acids /Organic solvent Unaffected from attacks by acid solution or organic solvents (e.g. Methyl isobutyl Ketone i.e. MIBK
		  • Flame Alignment in liquid beam Fully automatic, optimized with motorized burner mount for vertical and horizontal burner adjustment		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		• Nebulizer High precision able to provide manually adjustable uptake rates material of the nebulizer and related Venturi should be inert to acid solutions and organic solvents such as MIBK • Flame Control Computer controlled ignition • Gas Control Computer controlled with oxidant and fuel gases monitoring to monitor constant fuel / oxidant ration ignition • Safety Function Interlocking system to prevent ignition • Essential Interlock Monitor Burner type as well as its presence in position, air selector, flame sensor, liquid trap level, gas supply pressure and air supply anywhere in the network of gas tubings in the system • Automatic Lamp Selection Function Computer controlled Hollow Cathode Lamp selection and alignment Lamp Holder At least 8 lamp holder with built in power supplies for hollow cathode lamps and electrode – less discharge lamps or equivalent Operating Parameter setting Automatic Setting • Read Out /Display Display facility for absorbance as well as concentration, Display of errors or error codes, absorbance range at least up to 2.0 Abs. • Scale Expansion Scale expansion at least up to 100x • Integration time Integration time should cover at least 0.2 to 50 seconds range • Measurement Measurements of mean, RSD and CV, Background		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification

		only mode, Integration of peak height and peak areas.
		• Accessories / Spares with Flame AA System
		  • Vapour Generation Assembly: Should be continuous flow based hydride / mercury vapour generator with option of using with or without a programmable auto sampler
		  • Precision Precision of better than or at least 1% at ppb levels of mercury, arsenic etc.
		  • Absorption Cell The absorption cell's material should have no effect of the high heat of the flame and the cell for the analysis of mercury should be of a closed cell design
		  • Flame Arrester Flame arrester should be provided in the tube which connects the assembly to the absorption cell
		  • Cell Design holder. The design of the cell holder should give a firm and easily adjustable (for alignment) mounting on the burner head.
		  • System accessories Complete with necessary reagent bottles, connectors etc.
		  • Hollow Cathode lamps 16 hollow cathode lamps. One lamp each for the elements: Arsenic, Antimony, Boron,		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		Calcium, Chromium, Cobalt, Copper, Iron, 19 Nickel, Lead, Manganese, Mercury, Selenium, Tin, Vanadium and Zinc. Equivalent coded lamps will also be acceptable. • Air Compressor with Air Filter or equivalent Air Service Unit Complete with pressure regulator quite in operation, necessary tubing and connectors and should meet the air supply requirements of AAS operation. Oil Free Pump Oil- free pump and moisture trap Corrosion Resistant Resistant to acidic vapour and the drain value (if any) should be made of stainless steel of equivalent corrosion resistant material • Gas Regulators Nitrous – oxide gas regulator Nitrous Oxide Gas regulator (two stage) with heater, with necessary tubings and connectors. Necessary transformer should be provided to transform this supply to the requirements of the heater. The heater should work on 230±10volts 50 Hz AC power supply. Acetylene Gas regulator Acetylene gas regulator (two stage) with necessary tubing and connectors. Nitrogen Gas regulator Nitrogen regulator (two stage) with necessary tunings and connectors. • Graphite Furnace System: • Graphite Tube: Atomizer Should be computer controlled fully enclosed		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		graphite tube system consisting of stabilized temperature / total pyrolytic graphite plate form. • Gas Supplies: Provision of two gas supplies (programme selectable) with independent control over the gas supply through the furnace. • Heating Rate: Heating rate of at least 2000°C per second Cooling Time • Cooling time: 20 seconds • Temperature Range: Temperature range ambient to 2600°C or more in 1°C increments Feed back system • Feed back system for furnace temperature control, interlocks for water, gas, temperature, furnace door, graphite tube damage and mains power. • Temp. Programming: At least eight steps temperature programming facility with flexibility of programme selection, ramp time, gases, gas flow and read trigger for 20 each temperature step. • Control: Computer controlled with appropriate provision for print out of the furnace and sample parameters • Display: Calibration data / graphs, temperature profiles, signal graphics and the instrument status. • Memory: Memory should be able to store at least ten non volatile programmes • Ciller / Cooling Water Re-circulation Unit: Refrigerating water circulation unit of		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification

		appropriate capacity. No discharge of water from this water circulation unit.
		• DATA WORK STATION
		  • Application Software:
		  • Programme facility with multitasking software
		  • Should provide complete control of instrument with instrument status display and its various accessories.
		  • Provide accurate and reproducible time averaged, integration, non – averaged integration, multi level calibration.
		  • Software should handle instrument linear absorbance reading, concentration, or emission intensity, integration time, built-in statistics, calibration equation control, slope of analytical curve using operator selective calibration standard
		  • Built-in interface for computer connection and use of optional accessories.
		  • Comprehensive quality control protocols facility including blank, multiple quality control standards, QA/QC audit trail and calibration failure.
		  • Computer System:		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		• Make: Reputed brand such as HP/Compaq/IBM/ Dell • Processor: Intel core 2 duo processor 3.00 GHz or above • RAM: 4 GB (upgradable up to 8 GB) HDD 500 GB ultra DMA or higher HDD (7200 RMP) • Monitor: 21" TFT – LCD Flat Colour • CD ROM: 52X CD-ROM • DVD-CDRW: 32X DVD-ROM and CDRW – combo Drive Max speed 48x24x48 • Ports: 2 serial, 1 parallel and 2 USB front 6 rear USB2 PS/2 Port, 1 VGA integrated Port 1line in/out port • Key Board: 104 keys • Mouse: Optical mouse with pad • Ethernet: 32 bit auto selectable 10/100 MBPS • Graphics: Internet ready with integrated graphics • Sound: Integrated sound card and inbuilt stereo speakers • Printer HP Laserjet Printer 1200 x 1200 dpi 12 PPM black • Operation Software: • Preloaded Windows XP Professional operating system with Licensed CD		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		• MS Office 2000 Standard with media, manual and Licensed CD • Preloaded Antivirus with latest version along with Licensed CD • ADDITIONAL ITEMS • Operation Kit: Manufacturers Standard Operation Kit including all required items, tubings, fittings for start up / regular operation of instrument. • Operation / maintenance: Manual Operation / maintenance Manual for each unit Analytical manual • Analytical manual: including applications for flame, VGA and graphite system Service Manual • Service manual: with one set of required tools for each system / unit • Trouble Shooting Charts, Spare parts Catalogue, Application Notes for trace metal analysis in food and water samples • Dust Cover One for each unit • Consumables: For three years operation for each of the following units: Flame AAS (basic unit, burner system) Vapour generation assembly Graphite Furnace Atomizer Auto sampler • Operation and Maintenance Training: Two weeks training to be provided to two scientist on software training, operation, maintenance and troubleshooting aspects of instrument.		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification

		• General Conditions of Supply
		  • The instrument and all its units should operate on 230 ±10 volts 50Hz power supply
		  • All the operation and maintenance manuals, circuit diagrams, application notes and application softwares to be supplied should be in English Language.
		  • The supplier / manufacturer should have Indian Agent to provide after sales service.
		  • The main unit and all the sub units of the instrument should be serviced by the Indian representative of supplier.
		  • The Bidder should be a manufacturer / authorized representative of a manufacturer, who must have designed, manufactured, tested and supplied two numbers of such equipment similar to the type specified in the past five years, which shall be in successful operation for at least 2 years as on the date of bid opening.
		  • The bidder should furnish the information on past supplies and their satisfactory performance.
		  • Bidders shall invariably furnish documentary evidence (client's certificate – at least two) in support of the satisfactory operation of the equipment as specified above.
		  • Notwithstanding anything stated above the purchaser reserves the right to assess the capability and capacity of		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		the bidder to perform the contract, should the circumstances warrant such an assessment in the overall interest of the purchaser. • Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.		

2.	**LOVIBOND TINTOMETER**	• Measuring principle: Visual, in terms of Lovibond® units
		• Modes: Transmittance, reflectance Range 0.1 - 79.9 Red, Yellow; 0.1 - 49.9 Blue; 0.1 - 3.9 Neutral
		• Resolution: 0.1 Lovibond® unit
		• Optical system: 11 glass-filled nylon racks containing a graduated range of Lovibond® colour glasses
		• Viewing system Fully adjustable, prismatic with integral blue filter for light standardization
		• Light source 2 x 12 Volt, 10 Watt tungsten halogen lamp Illuminant approximates to daylight
		• Path length Up to 153 mm (6”)
		• Power pack 12 Volt ac, switchable to suit 220/110 Volt supply Approvals CE Instrument housing Fabricated sheet steel with a tough, textured paint finish
		• Conformance filters and certified colour reference solutions representing a range of Lovibond® colours, for quick and simple quality control checks on instruments and operators.
		• Certifications:
		  • Product certification: CE / US FDA / BIS certified.
		  • Quality Certification: ISO certified.		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		• Should provide calibration certificates from NIST traceable agencies during warranty & CMC period. Calibration cost will have to be borne by the supplier. • DQ, IQ, OQ, PQ Documentation during installation. • For validation vender should having it own capability with their own company trained service engineer to perform validation. No third part validation will be entertained. One validation at the time of installation should be done by company personnel. • Warranty: Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.		

3.	**FLAME PHOTOMETER**	• Range Na+: 0 to 199.9 ppm, K+: 0 to 9.99 ppm, Li+: 0 to 9.99 ppm
		• Sensitivity 0.1 ppm Na+; K=100 units
		• Specificity less than 0.5% interference when concentrations are equal to test sample concentrations
		• Reproducibility less than 0.5% C.V.
		• Linearity less than 1%
		• Display dual display; 3-1/2-digit LED, 12.5 mm (1/2")
		• Fuel supply high-grade propane/butane mixture regulated at approximately 30 psi
		• Air supply 6 liters/min at 12 psi; oil and moisture free
		• Recorder output 0.05 to 5 V (switchable)
		• Certifications:
		  • Product certification: CE / US FDA / BIS certified.
		  • Quality Certification: ISO certified.		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		• Should provide calibration certificates from NABL accredited agency every year during warranty & CMC period. Calibration cost will have to be borne by the supplier. • Equipment should be FDA / CE certified or equivalent standard of repute. It should be ISO 9001:2000 or other equivalent quality certification. • All electrical peripherals required for smooth functioning e.g. voltage stabilizer should be provided with the equipment. • Warranty: Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.		
4.	**MUFFLE FURNACE**	• 1200 degree with 23 liter capacity or more • Double Shell case, Stainless Steel • High Purity insulation material with efficient low thermal insulation • Bench top model • Vertically lift break switch/side lift break with front loading • Door: positive break switch Inside • Chamber Size: 245-280 mm x 340-400 mm x 230-250 mm (WDH) • Maximum temperature: 1200 ^{o}C Standard continuous temperature 1050 ^{o}C or more • Heating Rate: The furnace should be fast heating type with maximum attainable temperature should reach in 110 mins or better • Temperature control: Should be microprocessor based & at least 8 segment programmable 3216P1 or equivalent controller with necessary safety features. Programmable Temperature controller with heating		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		rate control from 10 deg. min-1 to 100 deg.min-1 preferable • Temperature Accuracy: ± 5 ^{o}C over the whole temperature range of operation and in the entire muffle • Safety: Over Temperature protection should be added • Gas purging: Gas purging facility (inert gas inlet and outlet) • Weight : less than 80 kg • The furnace should be CE certified with suitable power supply • Installation, training and commissioning: Vendor must ensure satisfactory installation and commissioning of the system at CFL, Kolkata. A detailed training on handling, operation and applications must be provided to at least 5 scientists. Installation services must include IQ/OQ/PQ • For validation vender should have its own capability with their own company trained service engineer to perform validation. No third part validation will be entertained. One validation at the time of installation should be done by company personnel. • Warranty: Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.		
5.	**GAS CHROMATOGRAPHY WITH FID AND ECD DETECTORS**	• Pesticides residues and other Food & Water related applications as per FSSAI requirements • Gas chromatograph with capability of operating concurrently with two injectors or better and three detectors. The system should be quoted with all accessories required to make it fully operational and any other item required for stated applications be quoted as optional.		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
	Oven	• Upto 450 °C, Fast Oven with 120 °C/min ramp, ≥~~20~~≥7ramps • Cool-down time from 450 °C to 50°C within 5 minutes • Should be able to accommodate two or more injectors and three detectors • Automatic leak test of system through single key		
	Pneumatic Controls	• 0-140 psi or better, all Electronic Pneumatic Controls with 0.1 psi precision		
	Injector (2 or more)	• Should be capable of large volume injection Temperature ramped splitless, Split and Cold on-column modes ≥450 °C max. and ≥10 ramps. • Multimode/PTV with 250µL or better Injection Volume capability with complete solvent vaporizer system or Equivalent. • Injector must be able to operate with capillary & wide bore columns • Injector must be provided with Backflush system.		
	Autosampler (Liquid and Headspace)	**Robust Liquid autosampler** capable of injecting ≥100 samples or better with syringe capacity of 0.5-100 µl • The type and volume of the syringe must be automatically detected by the system. • Must allow installation and automation of syringe featuring volumes from 0.5 to 100 µl. • Must be able to achieve combined multiple solvent rinsing with upto 4 different solvents. **Head space auto sampler** with a capacity ≥50 vials or better that support 10 & 20ml vial capacity with Pnuematic control • Incubation Oven Temperature Range 50 to 200 °C in 1 °C steps • Syringe Temperature 50 °C to 150 °C in 1 °C steps		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		• Incubation Oven Capacity vials or better		
	Detectors	• The GC must have complete integrated control of all parameters (no external control module) for the following detectors: FID, and ECD. • Detector must be independently controlled and operational for maximum sensitivity		
	Flame Ionization Detector (FID	• Linear range : better than 10^7 • Minimum detectable amount with makeup gases : 1.5 pgC/sec • Operating temperature limits: 450^{o}C with standard ceramic/quartz flame jet • Auto flame out detection. • Acquisition rate 50 Hz or more.		
	Electron Capture Detector ECD	• Linear dynamic range : better than 10^4 • Complete with ^{63}Ni source and low voltage heaters. • Minimum detectable amount: Less than 10 fg of lindane. • Operating temperature limits : 400^{o}C		
	Gas Supplies	• Required High purity Gas cylinders (2 No. Each)		
	SOFTWARE AND HARDWARE (Single point control of Software & Hardware)			
	Software	Complete system and software configuration must be 21 CFR Part 11 compliant. Software: Windows Based software with multitasking and capable of performing the following functions: Control the MS, acquire, store, process and reproduce the data. It must be able to control all the devices from same software. Software should allow monitoring of one molecular ion and upto four confirmatory ions. Quantification software for batch process must confirm the analytes as per regulatory requirements in food and environmental sample analysis as per the applications specified.All Flow Controller i.e. Carrier		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		flow, Make-up flow, Hydrogen flow, Air flow etc. value should set through Software by PC.Head Space Auto Sampler, Automation and event control from PC through same software.IQOQ of the system as well as software must be provided. Software update upto five years		
	Communication Hardware:	Latest Factory set, branded system with 22-23" Full HD Monitor with Printer - B/W - duplex - laser - Legal, A4 - 1200 dpi x 1200 dpi - up to 21 ppm – capacity with Network Card and Bluetooth facility.		
	IQOQPQ	IQOQPQ of instrument and Software should be provided along with document.		
	Training	Technical and application training to the personnel at site immediately after installation as per terms & conditions of tender.		
	Application Support	The Application support for stated applications required during method development and validations.		
	Pre Installation Requirements (PIR)	Provide PIR of the system**.**		
	OTHER REQUISITES FOR GC WITH ECD, FID			
	Automatic Change Over Manifold for each gas line			
	Complete Gas Purification Panel with fittings & installation of all gases			
	Renewable In Line Gas Purification System			
	Renewable gas purifier cartridge, Spare Set			
	Gas clean filters/Traps (6 No.)			
	Septa for injectors	Non stick, Low bleed, high puncture tolerance and Max. Temp 400 ^{o}C (*for each injector*). (400 No.)		
	Liners	• Suitable Ultra Inert Injector Liner for SS & SSL (20 No.) • Suitable Injector Liner upto 10 µL (6 No.) • Suitable Injector Liner upto 250 µL (6 No.) • Suitable Injector Liner upto 500 µL (6 No.)		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		• Liner O-Rings Max Temp 375 ^{o}C (100 No.) • **Liners types required as per the application**		
	Ferrules and Nuts	50 No. (for each column end and other interfaces as applicable), 50 No. for GC with ECD, NPD, FID		
	Columns for GC Applications	• Pesticide column (30m x 0.250mm x 0.25µm (HP-5MS / DB-1MS or equivalent) (02 no.) • Column for Fatty Acid Profiling with main concern of Trans Fatty Acid Application (02 No.) • Column for Cholesterol Application (02 No.)		
	Vials, caps and tool for autosampler *(Only Compatible sizes should be supplied)*	• 2000 No. each Vial sets (1, 2 mL, Crimp type, Amber and Clear glass) • 200 No. Vials (10,20ml Crimp type with cap & septa) • 1000 No. 300/500 µL Recovery vials • 6000 No. Septa PTFE/Silicone (for 1, 2 mL Vials) • 6000 No. Septa PTFE/Silicone (for 10, 20 mL Headspace Vials) • Ergonomic Crimping Tools for different vial types • Ergonomic Decapping Tools for different vial types • 10 No. each Storage Racks for (for 1, 2 mL Vials) • Head Space vials 10,20 ml capacity (500no. each)		
	Autosampler Syringe	10 µL (12 No.), 100 and 250 µL (04 No. each); Manual syringe-2µl, 5µl and 500 µl (04 No. each). Headspace syringe (02 no.10µl, 500µl,02 no. 1ml)		
	Sample Preparation *(Water & Food)*	QuEChERS Kits for Pesticides and Herbicides in following Matrices: • Water (1000 No.) • Matrices with high fat (1000 No.) • Matrices with high Water content and (1000 No.)		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		• Matrices with high pigmented (1000 No.)		
	Tools and Kits	Septa Removing tool		
		Tubing Cutter with rotating diamond blade for column		
		Tubing Cutter for stainless steel tubing (1/16 & 1/8 inch tubing)		
		Tubing Cutter for Plastic tubing with spare blade set		
	Miscellaneous	Consumables required for each detector must be provided		
	Warranty	Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.		
6.	**GAS CHROMATOGRAPHY WITH NPD AND THERMAL CONDUCTIVITIY DETECTOR(TCD) DETECTORS**	• Pesticides residues and other Food & Water related applications as per FSSAI requirements • Gas chromatograph with capability of operating concurrently with two injectors or better and three detectors. The system should be quoted with all accessories required to make it fully operational and any other item required for stated applications be quoted as optional.		
	Oven	• Upto 450 ^{o}C, Fast Oven with 120 ^{o}C/min ramp, ~~≥20~~≥7ramps • Cool-down time from 450 ^{o}C to 50^{o}C within 5 minutes • Should be able to accommodate two or more injectors and three detectors • Automatic leak test of system through single key		
	Pneumatic Controls	• 0-140 psi or better, all Electronic Pneumatic Controls with 0.1 psi precision		
	Injector (2 or more)	• Should be capable of large volume injection Temperature ramped split-less, Split and Cold on-column modes ≥450 ^{O}C max and ≥10 ramps.		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		• Multimode/PTV with 250µL or better Injection Volume capability with complete solvent vaporizer system or Equivalent. • Injector must be able to operate with capillary & wide bore columns • Injector must be provided with Backflush system.		
	Autosampler	**Robust Liquid autosampler** capable of injecting ≥100 samples or better with syringe capacity of 0.5-100 µl • The type and volume of the syringe must be automatically detected by the system. • Must allow installation and automation of syringe featuring volumes from 0.5 to 100 µl. • Must be able to achieve combined multiple solvent rinsing with upto 4 different solvents.		
	Detectors	• The GC must have complete integrated control of all parameters (no external control module) for the following detectors: NPD, and TCD. • Detector must be independently controlled and operational for maximum sensitivity		
	Nitrogen Phosphorus Detector (NPD)	• Minimum detectable amount: 100fg N/sec, 100fg P/sec • Linear dynamic range: better than 10^4 • Operating temperature limits: 450 °C with standard jet		
	Thermal Conductivity Detector TCD	• Capillary-column compatible • Proven constant current design • Software protection to prevent filament burnout • Ideal for series operation • 1/8-in. fittings • PPC pneumatics - software flow control of reference gas • Operating temperature 100 ˚C to 350 ˚C in 1 ˚C increments		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		• Sensitivity 9 µV/ppmnonane at 160 mA at the bridge with a detector temperature of 100 ˚C or 100 pgtridecane, /mL with He • Minimum detectable quantity Typically < 1 ppm nonane • Linear dynamic range: better than 10^5 +/- 5% • Operating temperature limits: 400 °C		
	Gas Supplies	• Required High purity Gas cylinders (2 No. Each)		
	SOFTWARE AND HARDWARE (Single point control of Software & Hardware)			
	Software	Complete system and software configuration must be 21 CFR Part 11 compliant. Software: Windows Based software with multitasking and capable of performing the following functions: Control the MS, acquire, store, process and reproduce the data. It must be able to control all the devices from same software. Software should allow monitoring of one molecular ion and upto four confirmatory ions. Quantification software for batch process must confirm the analytes as per regulatory requirements in food and environmental sample analysis as per the applications specified.All Flow Controller i.e. Carrier flow, Make-up flow, Hydrogen flow, Air flow etc. value should set through Software by PC.Head Space Auto Sampler, Automation and event control from PC through same software.IQOQ of the system as well as software must be provided.		
		Software update upto five years		
	Communication Hardware:	Latest Factory set, branded system with 22-23” Full HD Monitor with Printer - B/W - duplex - laser - Legal, A4 - 1200 dpi x 1200 dpi - up to 21 ppm – capacity with Network Card and Bluetooth facility.		
	IQOQPQ	IQOQPQ of instrument and Software should be provided along with document.		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
	Training	Technical and application training to the personnel at site immediately after installation as per terms & conditions of tender.		
	Application Support	The Application support for stated applications required during method development and validations.		
	Pre Installation Requirements (PIR)	Provide PIR of the system.		
	OTHER REQUISITES FOR GC WITH NPD, TCD			
	Automatic Change Over Manifold for each gas line			
	Complete Gas Purification Panel with fittings & installation of all gases			
	Renewable In Line Gas Purification System			
	Renewable gas purifier cartridge, Spare Set			
	Gas clean filters/Traps (6 No.)			
	Septa for injectors	Non stick, Low bleed, high puncture tolerance and Max. Temp 400 ^{o}C (*for each injector*). (400 No.)		
	Liners	• Suitable Ultra Inert Injector Liner for SS & SSL (20 No.) • Suitable Injector Liner upto 10 µL (6 No.) • Suitable Injector Liner upto 250 µL (6 No.) • Suitable Injector Liner upto 500 µL (6 No.) • Liner O-Rings Max Temp 375 ^{o}C (100 No.) • Liners types required as per the application		
	Ferrules and Nuts	50 No. (for each column end and other interfaces as applicable), 50 No. for GC with ECD, NPD, FID		
	Columns for GC Applications	• Pesticide column (30m x 0.250mm x 0.25µm (HP-5MS / DB-1MS or equivalent) (02 no.) • Column for Fatty Acid Profiling with main concern of Trans Fatty Acid Application (02 No.) • Column for Cholesterol Application (02 No.)		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
	Vials, caps and tool for autosampler *(Only Compatible sizes should be supplied)*	• 2000 No. each Vial sets (1, 2 mL, Crimp type, Amber and Clear glass) • 200 No. Vials (10,20ml Crimp type with cap & septa) • 1000 No. 300/500 µL Recovery vials • 6000 No. Septa PTFE/Silicone (for 1, 2 mL Vials) • Ergonomic Crimping Tools for different vial types • Ergonomic Decapping Tools for different vial types • 10 No. each Storage Racks for (for 1, 2 mL Vials)		
	Autosampler Syringe	10 µL (12 No.), 100 and 250 µL (04 No. each); Manual syringe-2µl, 5µl and 500 µl (04 No. each).		
	Sample Preparation *(Water & Food)*	QuEChERS Kits for Pesticides and Herbicides in following Matrices: • Water (1000 No.) • Matrices with high fat (1000 No.) • Matrices with high Water content and (1000 No.) • Matrices with high pigmented (1000 No.)		
	Tools and Kits	Septa Removing tool		
		Tubing Cutter with rotating diamond blade for column		
		Tubing Cutter for stainless steel tubing (1/16 & 1/8 inch tubing)		
		Tubing Cutter for Plastic tubing with spare blade set		
	Miscellaneous	Consumables required for each detector must be provided		
	Warranty	Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.		
7.	**MICROWAVE DIGESTION SYSTEM**	A latest model of microwave digestion system should enable rapid digestion for different inorganic/organic samples like; Different types of FSSAI food and food products, Fish and Fishery products, tea, seasoning powder, biscuits etc.		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
	Application	A latest model of microwave digestion system should enable rapid digestion for different inorganic/organic samples like; Different types of FSSAI food and food products, Fish and Fishery products, tea, seasoning powder, biscuits etc•		
	General	The instrument should have a superior pressure venting so as to prevent any loss of volatile metals and should have homogeneous microwave field to avoid sample burning		
	System	Microwave digestion system should have temperature and pressure controlling/monitoring system. The system should be software controlled. Different types of rotors available for the digestion of the different type samples should also be quoted. Necessary consumables and maintenance parts should also be quoted to run instrument trouble free		
	Instrument	The system should be a stand alone work station and should have • The System should have the feature of simply choose a method and it automatically recognizes the vessel type, counts the vessels and determines all of the parameters necessary for a fast, complete digestion • Should have provision that user can set the desired parameters for digestion • Should have Automatic Microwave power application depending on the load • Auto sensing of temperature and pressure inside the vessel • Be capable of processing different amounts of samples (from 0.3 g up to 10g) in the same run assuring the same conditions of temperature and pressure		
	Display	The Instrument should have the high-resolution, colour touch screen, acid		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		resistant, LED/LCD screen should serve as controller and display. Should be provided training videos for sample preparation vessel assembly, system use, and maintenance. Should have Data management – Easy access to stored methods, real-time data and results of past runs. Should be able to display the detailed methods, graphs o f temperature and power against time and temperature of individual vessels.		
	Interlocks	The system should have good interlocking system for safety and cavity door.		
	Vessel	The system should be high throughput which can hold atleast 24 high pressure vessels. Must be supplied with digestion vessel racks and suitably handle different digestion volumes.		
	System	The material of construction should be high purity TFM fluropolymer. Vessel should be capable of hanlding volumes between 10 ml and > 25 ml, if required. It should be operated for maximum temperature capacity of 250ºC or more and maximum pressure of 35 Bar or more. The system should be provided with temperature sensor (Thermocouple type/ Fiber optics/IR Sensor) which will measure real temperature of the vessels and control it. The vessels should have automatic venting and re-sealing system in case there is excess pressure development essential. After Digestion, vessels must be vent-able before uncapping the vessel for safety reasons. For ease of use, the vessels must not require the use of an energizing tool in order to reform seals prior to operation. Additional twelve numbers of vessels should be supplied along with the system.		
	Microwave Power and output	The Instrument should have single/dual magnetron 1500 W (or more of delivered energy, should provide the temperature		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
	with uniform energy distribution	needed (300 °C) for difficult samples and high-throughput vessel sets delivering unpulsed continuous power & precisely tuned wave guide. Disperses microwave energy uniformly throughout the cavity. No need for motor driven diffusers or attenuators. System software must automatically adjust the power delivery based upon sample load and pre-programmed control settings. Automatic Power control Technology delivers maximum energy to the sample, ensuring complete digestions. Controllable via microprocessor 230 V input, pulsed and unpulsed-essential 50 Hz, AC Operated. The Instrument should have “waveguide” between the magnetron (the microwave energy source) and the cavity. This waveguide fed system should provide maximum tuned transfer of microwave energy from the magnetron to the load in the microwave cavity. planes. This should result in uniform heating of the sample load.		
	Microwave Cavity	The microwave cavity should be heavy duty and have sufficient space to mount and dismount vessels individually and all parts inside the cavity should be totally microwave transparent. The Cavity should be constructed with non magnetic Rugged high-grade 316 solid steel cavity. The vessel assembly during a run should be visible from outside The coating inside the cavity should be acid/ chemical. resistant special polymer coating like fluro-polymer / PTFE.		
	Controls	The Instrument should have a) Reliable Temperature and b) Pressure controls independent of each other • Automatic temperature control system, temperature sensor should be protected properly from any chemical attack, sensor should monitor and control all vessels simultaneously-essential		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		• Automatic Pressure control: should have a pressure sensor which has a total capability of up to 500psi automatically control the pressure. It should be possible to remove the pressure device at a high pressure. The Vessels should act as self-regulators of pressure		
	Control	The control terminal should have high resolution LED/LCD Acid Resistant display. Touch screen which should have method storage capacity. All the features should be in built in the software. Should have provision for manual programming storage apart from pre-installed programme. Continuous display of temperature and power inside the reaction vessels is required.		
	Safety	There has to be multiple levels of safety. A safe mechanism to tackle the unused or reflected microwave energy Capable of shutting off in the event of the A very loud noise or bang in the instrument. If the temperature of the vessel is near its highest tolerance limit. Have inbuilt exhaust system to cool the vessels and to drive away if any fumes in the cavity-essential		
	Quality Standards	The manufacturer should be ISO 9001 certified for design and manufacture of microwave digestion system		
	Certification required for sign off	• IQ/OQ compliance • Calibration certificates for titrator • GLP-validated software for controlling the system		
	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		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		support services till customer satisfaction with the system.		
	Warranty	Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered. This will include yearly calibration start-up / commissioning routine servicing, regular maintenance, preventive maintenance of equipment and components and break down repairs as and when occurring, ensuring that system does not remain out of service for a period more than 24 hours in case of major breakdowns and 6-8 hour in the case of minor breakdowns due to any unforeseen break down. The institution will provide Water / Electricity power, etc. for maintenance work. The successful tenderer shall keep the essential spares at site during the Contract Period to avoid the delay in attending faults / maintenance.		
	Service contract clauses, including prices	List of all spares and accessories (including minor) with part numbers and price, required for maintenance and repairs in future after guarantee/warranty period should be attached.		
	Operating manuals, service manuals, other manuals	Should provide 2 sets (hardcopy and soft-copy) of:- • User, technical and maintenance manuals to be supplied in English language along with machine diagrams; • List of equipment and procedures required for local calibration and routine maintenance; • Service and operation manuals (original and copy) to be provided; • Advanced maintenance tasks documentation; • Certificate of calibration and inspection		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
	Certificates Performance and safety standards (specific to the device type);Local and/or international	• Should be FDA/CE/BIS approved product. • Manufacturer and Supplier should have ISO 13485 certification under ISO 9001for quality standards. • Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements (or equivalent BIS Standard) • Certified to be compliant with IEC 61010-1, IEC 61010-2-40 for safety		
	Supplier/ Manufacturer	• Must be ISO certified for quality		
	Service Support Contact details (Hierarchy Wise; including a toll free/landline number)	• Contact details of manufacturer, supplier and local service agent to be provided; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer;		
	Recommendations or warnings	• Any warning signs would be adequately displayed		
8.	**DIGITAL BUTRYO REFRACTOMETER**	For checking purity and adulteration of fats and oils		
	System	Automated Operating LCD screen directly without manual alignment, can connect PC with RS232 interface		
	Display	The required data to be displayed on the screen, including: the date, temperature, refractive index, concentration, and amended in accordance with the current temperature		
	Measurement Range (Automatic Temperature Controlled)	• Concentration 0;95% • Refractive Index 1.32422－1.7000		
	Minimum Indication	Butyro 0.1% RI 0.00001		
	Measurement Accuracy	Butyro ±0.5% (at 40˚C) RI ±0.0003 (at 40˚C)		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
	Precision (Reproducibilty	RI ± 0.00005 Butyro ± 0.05		
	Measurement Temperature	• 10 to 50˚C		
	Ambient Temperature Sample	• 10 to 40˚C		
	Volume Measurement Time	Less than 5 sec		
	Sample Volume	> 0.1 ml		
	Calibration certificate			
	Accessories	Reference Material Oil minimum 10 ml		
	Operation and training component	• The supplier will have to carry out successful Installation at the laboratory premises (where ever the system has to be installed) and provide on – site comprehensive training for a minimum of two scientific personnel operating the system till customer satisfaction		
	Certificates Performance and safety standards (specific to the device type);Local and/or international	• Should be FDA/CE/BIS approved product. • Manufacturer and Supplier should have ISO 13485 certification under ISO 9001for quality standards. • Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements(or equivalent BIS Standard) • Certified to be compliant with IEC 61010-1, IEC 61010-2-40 for safety		
	Supplier/ Manufacturer	• Must be ISO certified for quality		
	Service Support Contact details (Hierarchy Wise; including a toll free/landline number)	• Contact details of manufacturer, supplier and local service agent to be provided; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer;		
	Recommendations or warnings	• Any warning signs would be adequately displayed		
	Warranty	Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
	Service contract clauses, including prices	• List of all spares and accessories (including minor) with part numbers and price, required for maintenance and repairs in future after guarantee/warranty period should be attached;		
	Operating manuals, service manuals, other manuals	Should provide 2 sets(hardcopy and soft-copy) of:- • User, technical and maintenance manuals to be supplied in English language along with machine diagrams; • List of equipment and procedures required for local calibration and routine maintenance; • Service and operation manuals (original and copy) to be provided; • Advanced maintenance tasks documentation; • Certificate of calibration and inspection		
9.	**Flash point apparatus**	• Instrument designed in strict accordance with the test method ASTM D93, Method A and B. • Microprocessor controlled unit with digital easy to read display of the results. • Ignition :-Electric ignition and should also provide an automatic reignition facility. • Thermal detection (with metal sample temperature probe) of the flash to eliminate interference from water or silicone containing compound. • Cooling : - Facility for built-in cooling connection. • Automatic correction for standard barometric pressure vis-à-vis with final result. • Unit should have diagnostic program to check every key component and assembly and calibration facility.		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		• Unit should automatically determine flash point in strict compliance with the appropriate test method. • Heating should be microprocessor controlled at the specified rate; the ignitor is activated and dipped at precisely the correct temperature and frequency. • Safety device for fire protection with alarm. • Resistance check box for temperature calibration with calibration certificate. • The unit should be operable on 230v / 50 Hz. • The system should be ISO 9001 quality standard and supplied with operation manual. • Merely copying our specifications in the quotation shall not make the parties eligible for consideration of the quotation. A quotation has to be supported with the printed technical leaflet/literature of the quoted model of the item by the quoting party/manufacturer and the specifications mentioned in the quotation must be reflected/supported by the printed technical leaflet/literature. • Calibration : The firm must ensure that the equipment supplied is fully calibrated as per specification requirements and also source of future calibration at New Delhi & their frequency of calibration needed • Spares : Vendor should quote recommended spares for two years alongwith the equipment for smooth functioning of the equipment. • Spare Parts : Availability of spare parts of the equipment/instrument must be guaranteed for a period of at least seven years from the date of supply.		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification

		• After Sales Services: It should be clearly mentioned in the quotation whether the after sales services during and after the completion of warranty shall be provided directly by the supplier or their authorized agent/ representative. Terms of the after sales services, if any, may be mentioned in the offer. However, in both the cases the original supplier shall be responsible for poor performance/services.
		• Inspection: The inspection of the system will be done by our technical expert in the presence of firm representative.
		• Users List : The list of users specifically for the same model/make of the quoted item (not the list of general users) along with the complete name, address & contract numbers of the user organizations/persons may be submitted with the quotation along with the performance certificates from all/some of them.
		• Training: Our Scientist/Technical persons should be trained by the supplier at the project site free of cost. NOTE:- Firms having equipment wherein single mother unit can be used for carrying out Flash Point by Abel Flash Point using interchangeable analyzer unit shall be considered, if otherwise found suitable vis-à-vis price factor & performance. Other specification requirement for Abel Flash Point apparatus is enclosed.
		• Certifications:
		  • Product certification: CE / US FDA / BIS certified.
		  • Quality Certification: ISO certified.
		  • Should provide calibration certificates from NIST		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		traceable calibration solutions by any agency every year during warranty & CMC period. Calibration cost will have to be borne by the supplier. • Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered. • Buy-back price for old Automated Pensky-Martens closed-cup flash point tester with sample changer measures the flash point of up to 12 samples automatically [Make: Petrotest, Germany Model: PMA-4, Year of Installation: 2004] may also be quoted.		
10.	**Water Purification system**	Table top Water Purification System (Tap Water Feed) should be capable of produce water for use in HPLC solvents, Microbiology and reagent grade with the help of pre-treatment module; RO Module, DI Module, Storage tank, UV Oxidation Chamber, Polishing module and final membrane filter 0.22um		
	Pre-treatment System	Should consists: • 5 micron,1 micron and Activated Carbon wrapped type depth filter • Pressure gauge with regulator • The unit should have automatic low/high pressure cut-off		
	Reverse Osmosis with Electro Deionization Stage:	▪ Pre-treatment cartridge with auto-scaling compounds, 0.5 micron filter and activated carbon or better. ▪ Prefilter combination to protect the RO Membranes life or better. ▪ RO Module with high performance thin film composite membrane with salt retention rate up to 98%. The retention rate for dissolved organic compounds, particles & colloids & bacteria exceeds 99% ▪ Deionization Module: Mixed bed		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		resin module utilized for a reduction of the inlet conductivity. Used for inorganic applications. ▪ Conductivity measurement is to be done after RO, DI & Polishing module to monitor the performance of Individual cartridge. ▪ Should have suitable back wash programme before every operation or better		
	Storage Tank:	• 30 L or better Storage Tank with UV Lamp, Air filter, CO2 Trap & Level Sensor. • The tank should made of pure water resistant Poly Ethylene material with an outlet to drain the tank totally and a pressure sensor for the tank level control • The storage tank should be 100% drainable.		
	General requirements	▪ Online UV oxidation chamber: UV Light Energy at 185 nm & 254 nm wavelengths. ▪ TOC Measurement: Online continuous TOC measurement with Live Display. ▪ Sterile Filter with 0.22 µm or better with Autoclavable option for re-use ▪ System should meet reagent water quality standards including ASTM Type 1, CLSI and ISO 3696 Type I ▪ System should have flexible remote dispenser to dispense water whenever needed ▪ System should have built-in automatic self-cleaning mechanism to extend the life of cartridge ▪ Automatic flushing and recirculation in standby mode to maintain consistent peak water purity ▪ User can collect RO Quality water from the Storage tank & ultrapure water from flexible dispenser ▪ Should have cartridge change indicator ▪ The system should incorporate a fully		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
		comprehensive, graphic colour LCD display to provide system status, performance parameters, routine maintenance status and alarms of troubleshooting, tank level status and automatic warning of reordering of consumables and ▪ Provision for digital display to indicate status of operation, resistivity or conductivity, temperature and also alarm system in case of malfunctioning.		
	Pure Water Specification: (Type-2) •	• Production Rate : 10 LPH or better • Conductivity : <2µs/cm at 298K (25°C) or better • pH at 298K (25°C) => 6.6 or effectively neutral • Total silica max 3ug/L or better		
	The Ultrapure Product Water should of the following specifications: (Type-1)	• Flow Rate : 1.0 L/min or better • Should have conductivity @ 25 Deg C : 0.055 µs/cm or better • Should have resistivity @ 25 Deg C : 18.2 MΩ-cm or better • TOC : < 1 ppb or better • Bacteria : <1 cfu/ml or better • Particles >0.1µm : <1 per ml or better • pH at 298K (25°C) = > 6.6 or Effectively neutral		
	Certification required for sign off	• IQ/OQ compliance • Calibration certificates for titrator		
	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.		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
	Warranty	Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered. This will include yearly calibration start-up / commissioning routine servicing, regular maintenance, preventive maintenance of equipment and components and break down repairs as and when occurring, ensuring that system does not remain out of service for a period more than 24 hours in case of major breakdowns and 6-8 hour in the case of minor breakdowns due to any unforeseen break down. The institution will provide Water / Electricity power, etc. for maintenance work. The successful tenderer shall keep the essential spares at site during the Contract Period to avoid the delay in attending faults / maintenance.		
	Service contract clauses, including prices	List of all spares and accessories (including minor) with part numbers and price, required for maintenance and repairs in future after guarantee/warranty period should be attached;		
	Operating manuals, service manuals, other manuals	Should provide 2 sets(hardcopy and soft-copy) of:- • User, technical and maintenance manuals to be supplied in English language along with machine diagrams; • List of equipment and procedures required for local calibration and routine maintenance; • Service and operation manuals (original and copy) to be provided; • Advanced maintenance tasks documentation; • Certificate of calibration and inspection		
	Certificates Performance and safety standards (specific to the device	• Should be FDA/CE/BIS approved product. • Manufacturer and Supplier should have ISO 13485		

Sl.No	Item	Specifications	Please Specify whether the quoted model meets the specification (Yes/No)	Name of the Model and its Specification
	type);Local and/or international	certification under ISO 9001for quality standards. • Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements (or equivalent BIS Standard) • Certified to be compliant with IEC 61010-1, IEC 61010-2-40 for safety		
	Supplier/ Manufacturer	• Must be ISO certified for quality		
	Service Support Contact details (Hierarchy Wise; including a toll free/landline number)	• Contact details of manufacturer, supplier and local service agent to be provided; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer;		
	Recommendations or warnings	• Any warning signs would be adequately displayed		

Note : List of Installations of the quoted Model or a comparable model of equivalent sensitivity preferably in food analysis sector in India (Attach Performance certificate from the organizations where the quoted model or a comparable model of equivalent sensitivity has already been installed)

(d) Part IV- Special Conditions of RFP is **revised** as under:

14 (b) <u>Response time</u>: The response time of the Seller should not exceed 72 hours from the time the breakdown intimation is provided by the Buyer.

(e) Part V- Evaluation Criteria and Price Bid issue is **revised** as under:

2. **Revised Price Bid Format :**The Revised Price Bid Format is given below and Bidders are required to fill this up correctly with full details, as required under Part-II of RFP :-

(a) Basic cost of the item/items:

Cost Details

Sl.No	Item	Specifications	Price in INR

1.	**ATOMIC ABSORPTION SPECTROPHOTMETER [GTA /FLAME / VGA]**	• Atomic Absorption Spectrophotometer (GTA/FLAME/VGA), Computer Controlled with built-in flame emission mode, Unit for Flame (Air Acetylene and nitrous oxide- acetylene), Graphite Tube Atomizer (GTA), Chiller / Water circulating unit, Auto samplers for GTA and flame
		• Wave length range 190 – 800 nm wave length
		• Sensitivity at least 0.9 abs for 5µg/ml aqueous copper standard solution with air – acetylene flame
		• Optics: Double Beam dual blazed / holographic Czerny turner Monochromator
		  • Focal length At least 250 mm focal length
		  • Resolution 1800 lines / mm
		  • Width Automatic bandwidth of 0.2 to 1.0 nm
		• Flame Atomizer: All titanium or equivalent burner with impact bead / Flow spoiler, premix Design
		  • Movement Automatic movement into the sample compartment
		  • Affect from Acids /Organic solvent Unaffected from attacks by acid solution or organic solvents (e.g. Methyl isobutyl Ketone i.e. MIBK
		  • Flame Alignment in liquid beam Fully automatic, optimized with motorized burner mount for vertical and horizontal burner adjustment
		  • Nebulizer High precision able to provide manually adjustable uptake rates material of the nebulizer and related Venturi should be inert to acid solutions and organic solvents such as MIBK
		• Flame Control Computer controlled ignition
		• Gas Control Computer controlled with oxidant and fuel gases monitoring to monitor constant fuel / oxidant ration ignition	

Sl.No	Item	Specifications	Price in INR

		• Safety Function Interlocking system to prevent ignition
		• Essential Interlock Monitor Burner type as well as its presence in position, air selector, flame sensor, liquid trap level, gas supply pressure and air supply anywhere in the network of gas tubings in the system
		• Automatic Lamp Selection Function Computer controlled Hollow Cathode Lamp selection and alignment Lamp Holder At least 8 lamp holder with built in power supplies for hollow cathode lamps and electrode – less discharge lamps or equivalent Operating Parameter setting Automatic Setting
		• Read Out /Display Display facility for absorbance as well as concentration, Display of errors or error codes, absorbance range at least up to 2.0 Abs.
		  • Scale Expansion Scale expansion at least up to 100x
		  • Integration time Integration time should cover at least 0.2 to 50 seconds range
		  • Measurement Measurements of mean, RSD and CV, Background only mode, Integration of peak height and peak areas.
		• Accessories / Spares with Flame AA System
		  • Vapour Generation Assembly: Should be continuous flow based hydride / mercury vapour generator with option of using with or without a programmable auto sampler
		  • Precision Precision of better than or at least 1% at ppb levels of mercury, arsenic etc.
		  • Absorption Cell The absorption cell's material should have no effect of the high heat of the flame and the cell for the analysis of mercury should be of a closed cell design
		  • Flame Arrester Flame arrester should be provided in the tube which connects the assembly to the absorption cell
		  • Cell Design holder. The design of the cell holder should give a firm and easily adjustable (for alignment) mounting on the burner head.	

Sl.No	Item	Specifications	Price in INR
		• System accessories Complete with necessary reagent bottles, connectors etc. • Hollow Cathode lamps 16 hollow cathode lamps. One lamp each for the elements: Arsenic, Antimony, Boron, Calcium, Chromium, Cobalt, Copper, Iron, 19 Nickel, Lead, Manganese, Mercury, Selenium, Tin, Vanadium and Zinc. Equivalent coded lamps will also be acceptable. • Air Compressor with Air Filter or equivalent Air Service Unit Complete with pressure regulator quite in operation, necessary tubing and connectors and should meet the air supply requirements of AAS operation. Oil Free Pump Oil- free pump and moisture trap Corrosion Resistant Resistant to acidic vapour and the drain value (if any) should be made of stainless steel of equivalent corrosion resistant material • Gas Regulators Nitrous – oxide gas regulator Nitrous Oxide Gas regulator (two stage) with heater, with necessary tubings and connectors. Necessary transformer should be provided to transform this supply to the requirements of the heater. The heater should work on 230±10volts 50 Hz AC power supply. Acetylene Gas regulator Acetylene gas regulator (two stage) with necessary tubing and connectors. Nitrogen Gas regulator Nitrogen regulator (two stage) with necessary tunings and connectors. • Graphite Furnace System: • Graphite Tube: Atomizer Should be computer controlled fully enclosed graphite tube system consisting of stabilized temperature / total pyrolytic graphite plate form. • Gas Supplies: Provision of two gas supplies (programme selectable) with independent control over the gas supply through the furnace. • Heating Rate: Heating rate of at least 2000°C per second Cooling Time • Cooling time: 20 seconds	

Sl.No	Item	Specifications	Price in INR
		• Temperature Range: Temperature range ambient to 2600°C or more in 1°C increments Feed back system • Feed back system for furnace temperature control, interlocks for water, gas, temperature, furnace door, graphite tube damage and mains power. • Temp. Programming: At least eight steps temperature programming facility with flexibility of programme selection, ramp time, gases, gas flow and read trigger for 20 each temperature step. • Control: Computer controlled with appropriate provision for print out of the furnace and sample parameters • Display: Calibration data / graphs, temperature profiles, signal graphics and the instrument status. • Memory: Memory should be able to store at least ten non volatile programmes • Ciller / Cooling Water Re-circulation Unit: Refrigerating water circulation unit of appropriate capacity. No discharge of water from this water circulation unit. • DATA WORK STATION • Application Software: • Programme facility with multitasking software • Should provide complete control of instrument with instrument status display and its various accessories. • Provide accurate and reproducible time averaged, integration, non – averaged integration, multi level calibration. • Software should handle instrument linear absorbance reading, concentration, or emission intensity, integration time, built-in statistics, calibration equation control, slope of analytical curve using operator selective calibration standard • Built-in interface for computer connection and use of optional accessories. • Comprehensive quality control protocols facility including blank, multiple quality control standards,	

Sl.No	Item	Specifications	Price in INR

		QA/QC audit trail and calibration failure.
		• Computer System:
		  • Make: Reputed brand such as HP/Compaq/IBM/ Dell
		  • Processor: Intel core 2 duo processor 3.00 GHz or above
		  • RAM: 4 GB (upgradable up to 8 GB) HDD 500 GB ultra DMA or higher HDD (7200 RMP)
		  • Monitor: 21” TFT – LCD Flat Colour
		  • CD ROM: 52X CD- ROM
		  • DVD-CDRW: 32X DVD-ROM and CDRW – combo Drive Max speed 48x24x48
		  • Ports: 2 serial, 1 parallel and 2 USB front 6 rear USB2 PS/2 Port, 1 VGA integrated Port 1line in/out port
		  • Key Board: 104 keys
		  • Mouse: Optical mouse with pad
		  • Ethernet: 32 bit auto selectable 10/100 MBPS
		  • Graphics: Internet ready with integrated graphics
		  • Sound: Integrated sound card and inbuilt stereo speakers
		  • Printer HP Laserjet Printer 1200 x 1200 dpi 12 PPM black
		• Operation Software:
		  • Preloaded Windows XP Professional operating system with Licensed CD
		  • MS Office 2000 Standard with media, manual and Licensed CD
		  • Preloaded Antivirus with latest version along with Licensed CD
		• ADDITIONAL ITEMS
		  • Operation Kit: Manufacturers Standard Operation Kit including all required items, tubings, fittings for start up / regular operation of instrument.
		  • Operation / maintenance: Manual Operation / maintenance Manual for each unit Analytical manual
		  • Analytical manual: including applications for flame, VGA and graphite system Service Manual
		  • Service manual: with one set of required tools for each system / unit	

Sl.No	Item	Specifications	Price in INR
		• Trouble Shooting Charts, Spare parts Catalogue, Application Notes for trace metal analysis in food and water samples • Dust Cover One for each unit • Consumables: For three years operation for each of the following units: Flame AAS (basic unit, burner system) Vapour generation assembly Graphite Furnace Atomizer Auto sampler • Operation and Maintenance Training: Two weeks training to be provided to two scientist on software training, operation, maintenance and troubleshooting aspects of instrument. • General Conditions of Supply • The instrument and all its units should operate on 230 ±10 volts 50Hz power supply • All the operation and maintenance manuals, circuit diagrams, application notes and application softwares to be supplied should be in English Language. • The supplier / manufacturer should have Indian Agent to provide after sales service. • The main unit and all the sub units of the instrument should be serviced by the Indian representative of supplier. • The Bidder should be a manufacturer / authorized representative of a manufacturer, who must have designed, manufactured, tested and supplied two numbers of such equipment similar to the type specified in the past five years, which shall be in successful operation for at least 2 years as on the date of bid opening. • The bidder should furnish the information on past supplies and their satisfactory performance. • Bidders shall invariably furnish documentary evidence (client's certificate – at least two) in support of the satisfactory operation of the equipment as specified above. • Notwithstanding anything stated above the purchaser reserves the right to assess the capability and capacity of the bidder to perform the contract, should the circumstances warrant such an	

Sl.No	Item	Specifications	Price in INR
		assessment in the overall interest of the purchaser. • Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.	

2.	**LOVIBOND TINTOMETER**	• Measuring principle: Visual, in terms of Lovibond® units
		• Modes: Transmittance, reflectance Range 0.1 - 79.9 Red, Yellow; 0.1 - 49.9 Blue; 0.1 - 3.9 Neutral
		• Resolution: 0.1 Lovibond® unit
		• Optical system: 11 glass-filled nylon racks containing a graduated range of Lovibond® colour glasses
		• Viewing system Fully adjustable, prismatic with integral blue filter for light standardization
		• Light source 2 x 12 Volt, 10 Watt tungsten halogen lamp Illuminant approximates to daylight
		• Path length Up to 153 mm (6”)
		• Power pack 12 Volt ac, switchable to suit 220/110 Volt supply Approvals CE Instrument housing Fabricated sheet steel with a tough, textured paint finish
		• Conformance filters and certified colour reference solutions representing a range of Lovibond® colours, for quick and simple quality control checks on instruments and operators.
		• Certifications:
		  • Product certification: CE / US FDA / BIS certified.
		  • Quality Certification: ISO certified.
		  • Should provide calibration certificates from NIST traceable agencies during warranty & CMC period. Calibration cost will have to be borne by the supplier.
		• DQ, IQ, OQ, PQ Documentation during installation.
		• For validation vender should having it own capability with their own company trained service engineer to perform validation. No third part validation will be entertained. One validation at the time of installation should be done by company personnel.
		• Warranty: Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.	

3.	**FLAME PHOTOMETER**	• Range Na+: 0 to 199.9 ppm, K+: 0 to 9.99 ppm, Li+: 0 to 9.99 ppm • Sensitivity 0.1 ppm Na+; K=100 units	

Sl.No	Item	Specifications	Price in INR

		• Specificity less than 0.5% interference when concentrations are equal to test sample concentrations
		• Reproducibility less than 0.5% C.V.
		• Linearity less than 1%
		• Display dual display; 3-1/2-digit LED, 12.5 mm (1/2")
		• Fuel supply high-grade propane/butane mixture regulated at approximately 30 psi
		• Air supply 6 liters/min at 12 psi; oil and moisture free
		• Recorder output 0.05 to 5 V (switchable)
		• Certifications:
		  • Product certification: CE / US FDA / BIS certified.
		  • Quality Certification: ISO certified.
		  • Should provide calibration certificates from NABL accredited agency every year during warranty & CMC period. Calibration cost will have to be borne by the supplier.
		• Equipment should be FDA / CE certified or equivalent standard of repute. It should be ISO 9001:2000 or other equivalent quality certification.
		• All electrical peripherals required for smooth functioning e.g. voltage stabilizer should be provided with the equipment.
		• Warranty: Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.	

4.	**MUFFLE FURNACE**	• 1200 degree with 23 liter capacity or more • Double Shell case, Stainless Steel • High Purity insulation material with efficient low thermal insulation • Bench top model • Vertically lift break switch/side lift break with front loading • Door: positive break switch Inside • Chamber Size: 245-280 mm x 340-400 mm x 230-250 mm (WDH) • Maximum temperature: 1200 ^{o}C Standard continuous temperature 1050 ^{o}C or more • Heating Rate: The furnace should be fast heating type with maximum attainable temperature should reach in 110 mins or better • Temperature control: Should be microprocessor based & at least 8 segment programmable 3216P1 or equivalent controller with necessary safety features. Programmable	

Sl.No	Item	Specifications	Price in INR
		Temperature controller with heating rate control from 10 deg. min-1 to 100 deg.min-1 preferable • Temperature Accuracy: ± 5 ^{o}C over the whole temperature range of operation and in the entire muffle • Safety: Over Temperature protection should be added • Gas purging: Gas purging facility (inert gas inlet and outlet) • Weight : less than 80 kg • The furnace should be CE certified with suitable power supply • Installation, training and commissioning: Vendor must ensure satisfactory installation and commissioning of the system at CFL, Kolkata. A detailed training on handling, operation and applications must be provided to at least 5 scientists. Installation services must include IQ/OQ/PQ • For validation vender should have its own capability with their own company trained service engineer to perform validation. No third part validation will be entertained. One validation at the time of installation should be done by company personnel. • Warranty: Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.	
5.	**GAS CHROMATOGRAPHY WITH FID AND ECD DETECTORS**	• Pesticides residues and other Food & Water related applications as per FSSAI requirements • Gas chromatograph with capability of operating concurrently with two injectors or better and three detectors. The system should be quoted with all accessories required to make it fully operational and any other item required for stated applications be quoted as optional.	
	Oven	• Upto 450 ^{o}C, Fast Oven with 120 ^{o}C/min ramp, ~~≥20~~≥7ramps • Cool-down time from 450 ^{o}C to 50^{o}C within 5 minutes • Should be able to accommodate two or more injectors and three detectors • Automatic leak test of system through single key	
	Pneumatic Controls	• 0-140 psi or better, all Electronic Pneumatic Controls with 0.1 psi precision	
	Injector (2 or more)	• Should be capable of large volume injection Temperature ramped splitless, Split and Cold on-column modes ≥450 ^{O}C max. and ≥10 ramps.	

Sl.No	Item	Specifications	Price in INR
		• Multimode/PTV with 250µL or better Injection Volume capability with complete solvent vaporizer system or Equivalent. • Injector must be able to operate with capillary & wide bore columns • Injector must be provided with Backflush system.	
	Autosampler (Liquid and Headspace)	**Robust Liquid autosampler** capable of injecting ≥100 samples or better with syringe capacity of 0.5-100 µl • The type and volume of the syringe must be automatically detected by the system. • Must allow installation and automation of syringe featuring volumes from 0.5 to 100 µl. • Must be able to achieve combined multiple solvent rinsing with upto 4 different solvents. **Head space auto sampler** with a capacity ≥50 vials or better that support 10 & 20ml vial capacity with Pnuematic control • Incubation Oven Temperature Range 50 to 200 °C in 1 °C steps • Syringe Temperature 50 °C to 150 °C in 1 °C steps • Incubation Oven Capacity vials or better	
	Detectors	• The GC must have complete integrated control of all parameters (no external control module) for the following detectors: FID, and ECD. • Detector must be independently controlled and operational for maximum sensitivity	
	Flame Ionization Detector (FID	• Linear range : better than 10^7 • Minimum detectable amount with makeup gases : 1.5 pgC/sec • Operating temperature limits: 450^{o}C with standard ceramic/quartz flame jet • Auto flame out detection. • Acquisition rate 50 Hz or more.	
	Electron Capture Detector ECD	• Linear dynamic range : better than 10^4 • Complete with ^{63}Ni source and low voltage heaters. • Minimum detectable amount: Less than 10 fg of lindane. • Operating temperature limits : 400^{o}C	
	Gas Supplies	• Required High purity Gas cylinders (2 No. Each)	
	SOFTWARE AND HARDWARE (Single point control of Software & Hardware)		
	Software	Complete system and software configuration must be 21 CFR Part 11 compliant. Software: Windows Based software with multitasking and capable of performing the following functions: Control the MS, acquire, store, process and reproduce the data. It	

Sl.No	Item	Specifications	Price in INR
		must be able to control all the devices from same software. Software should allow monitoring of one molecular ion and upto four confirmatory ions. Quantification software for batch process must confirm the analytes as per regulatory requirements in food and environmental sample analysis as per the applications specified.All Flow Controller i.e. Carrier flow, Make-up flow, Hydrogen flow, Air flow etc. value should set through Software by PC.Head Space Auto Sampler, Automation and event control from PC through same software.IQOQ of the system as well as software must be provided. Software update upto five years	
	Communication Hardware:	Latest Factory set, branded system with 22-23" Full HD Monitor with Printer - B/W - duplex - laser - Legal, A4 - 1200 dpi x 1200 dpi - up to 21 ppm – capacity with Network Card and Bluetooth facility.	
	IQOQPQ	IQOQPQ of instrument and Software should be provided along with document.	
	Training	Technical and application training to the personnel at site immediately after installation as per terms & conditions of tender.	
	Application Support	The Application support for stated applications required during method development and validations.	
	Pre Installation Requirements (PIR)	Provide PIR of the system**.**	
	OTHER REQUISITES FOR GC WITH ECD, FID		
	Automatic Change Over Manifold for each gas line		
	Complete Gas Purification Panel with fittings & installation of all gases		
	Renewable In Line Gas Purification System		
	Renewable gas purifier cartridge, Spare Set		
	Gas clean filters/Traps (6 No.)		
	Septa for injectors	Non stick, Low bleed, high puncture tolerance and Max. Temp 400 ^{o}C (*for each injector*). (400 No.)	
	Liners	• Suitable Ultra Inert Injector Liner for SS & SSL (20 No.) • Suitable Injector Liner upto 10 µL (6 No.) • Suitable Injector Liner upto 250 µL (6 No.) • Suitable Injector Liner upto 500 µL (6 No.) • Liner O-Rings Max Temp 375 ^{o}C (100 No.) • **Liners types required as per the application**	
	Ferrules and Nuts	50 No. (for each column end and other interfaces as applicable), 50 No. for GC with ECD, NPD, FID	
	Columns for GC Applications	• Pesticide column (30m x 0.250mm x 0.25µm (HP-5MS / DB-1MS or equivalent) (02 no.) • Column for Fatty Acid Profiling with main concern of Trans Fatty Acid Application (02 No.)	

Sl.No	Item	Specifications	Price in INR
		• Column for Cholesterol Application (02 No.)	
	Vials, caps and tool for autosampler *(Only Compatible sizes should be supplied)*	• 2000 No. each Vial sets (1, 2 mL, Crimp type, Amber and Clear glass) • 200 No. Vials (10,20ml Crimp type with cap & septa) • 1000 No. 300/500 µL Recovery vials • 6000 No. Septa PTFE/Silicone (for 1, 2 mL Vials) • 6000 No. Septa PTFE/Silicone (for 10, 20 mL Headspace Vials) • Ergonomic Crimping Tools for different vial types • Ergonomic Decapping Tools for different vial types • 10 No. each Storage Racks for (for 1, 2 mL Vials) • Head Space vials 10,20 ml capacity (500no. each)	
	Autosampler Syringe	10 µL (12 No.), 100 and 250 µL (04 No. each); Manual syringe-2µl, 5µl and 500 µl (04 No. each). Headspace syringe (02 no.10µl, 500µl,02 no. 1ml)	
	Sample Preparation *(Water & Food)*	QuEChERS Kits for Pesticides and Herbicides in following Matrices: • Water (1000 No.) • Matrices with high fat (1000 No.) • Matrices with high Water content and (1000 No.) • Matrices with high pigmented (1000 No.)	
	Tools and Kits	Septa Removing tool	
		Tubing Cutter with rotating diamond blade for column	
		Tubing Cutter for stainless steel tubing (1/16 & 1/8 inch tubing)	
		Tubing Cutter for Plastic tubing with spare blade set	
	Miscellaneous	Consumables required for each detector must be provided	
	Warranty	Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.	
6.	**GAS CHROMATOGRAPHY WITH NPD AND THERMAL CONDUCTIVITIY DETECTOR (TCD)**	• Pesticides residues and other Food & Water related applications as per FSSAI requirements • Gas chromatograph with capability of operating concurrently with two injectors or better and three detectors. The system should be quoted with all accessories required to make it fully operational and any other item required for stated applications be quoted as optional.	

Sl.No	Item	Specifications	Price in INR
	DETECTORS		
	Oven	• Upto 450 ^{o}C, Fast Oven with 120 ^{o}C/min ramp, ~~≥20~~≥7ramps • Cool-down time from 450 ^{o}C to 50^{o}C within 5 minutes • Should be able to accommodate two or more injectors and three detectors • Automatic leak test of system through single key	
	Pneumatic Controls	• 0-140 psi or better, all Electronic Pneumatic Controls with 0.1 psi precision	
	Injector (2 or more)	• Should be capable of large volume injection Temperature ramped split-less, Split and Cold on-column modes ≥450 ^{O}C max and ≥10 ramps. • Multimode/PTV with 250µL or better Injection Volume capability with complete solvent vaporizer system or Equivalent. • Injector must be able to operate with capillary & wide bore columns • Injector must be provided with Backflush system.	
	Autosampler	**Robust Liquid autosampler** capable of injecting ≥100 samples or better with syringe capacity of 0.5-100 µl • The type and volume of the syringe must be automatically detected by the system. • Must allow installation and automation of syringe featuring volumes from 0.5 to 100 µl. • Must be able to achieve combined multiple solvent rinsing with upto 4 different solvents.	
	Detectors	• The GC must have complete integrated control of all parameters (no external control module) for the following detectors: NPD, and TCD. • Detector must be independently controlled and operational for maximum sensitivity	
	Nitrogen Phosphorus Detector (NPD)	• Minimum detectable amount: 100fg N/sec, 100fg P/sec • Linear dynamic range: better than 10^4 • Operating temperature limits: 450 °C with standard jet	
	Thermal Conductivity Detector TCD	• Capillary-column compatible • Proven constant current design • Software protection to prevent filament burnout • Ideal for series operation • 1/8-in. fittings • PPC pneumatics - software flow control of reference gas	

Sl.No	Item	Specifications	Price in INR
		• Operating temperature 100 ˚C to 350 ˚C in 1 ˚C increments • Sensitivity 9 µV/ppmnonane at 160 mA at the bridge with a detector temperature of 100 ˚C or 100 pgtridecane, /mL with He • Minimum detectable quantity Typically < 1 ppm nonane • Linear dynamic range: better than 10^5 +/- 5% • Operating temperature limits: 400 °C	
	Gas Supplies	• Required High purity Gas cylinders (2 No. Each)	
	SOFTWARE AND HARDWARE (Single point control of Software & Hardware)		
	Software	Complete system and software configuration must be 21 CFR Part 11 compliant. Software: Windows Based software with multitasking and capable of performing the following functions: Control the MS, acquire, store, process and reproduce the data. It must be able to control all the devices from same software. Software should allow monitoring of one molecular ion and upto four confirmatory ions. Quantification software for batch process must confirm the analytes as per regulatory requirements in food and environmental sample analysis as per the applications specified.All Flow Controller i.e. Carrier flow, Make-up flow, Hydrogen flow, Air flow etc. value should set through Software by PC.Head Space Auto Sampler, Automation and event control from PC through same software.IQOQ of the system as well as software must be provided.	
		Software update upto five years	
	Communication Hardware:	Latest Factory set, branded system with 22-23” Full HD Monitor with Printer - B/W - duplex - laser - Legal, A4 - 1200 dpi x 1200 dpi - up to 21 ppm – capacity with Network Card and Bluetooth facility.	
	IQOQPQ	IQOQPQ of instrument and Software should be provided along with document.	
	Training	Technical and application training to the personnel at site immediately after installation as per terms & conditions of tender.	
	Application Support	The Application support for stated applications required during method development and validations.	
	Pre Installation Requirements (PIR)	Provide PIR of the system.	
	OTHER REQUISITES FOR GC WITH NPD, TCD		
	Automatic Change Over Manifold for each gas line		
	Complete Gas Purification Panel with fittings & installation of all gases		
	Renewable In Line Gas Purification System		

Sl.No	Item	Specifications	Price in INR
	Renewable gas purifier cartridge, Spare Set		
	Gas clean filters/Traps (6 No.)		
	Septa for injectors	Non stick, Low bleed, high puncture tolerance and Max. Temp 400 ^{o}C (*for each injector*). (400 No.)	
	Liners	• Suitable Ultra Inert Injector Liner for SS & SSL (20 No.) • Suitable Injector Liner upto 10 µL (6 No.) • Suitable Injector Liner upto 250 µL (6 No.) • Suitable Injector Liner upto 500 µL (6 No.) • Liner O-Rings Max Temp 375 ^{o}C (100 No.) • Liners types required as per the application	
	Ferrules and Nuts	50 No. (for each column end and other interfaces as applicable), 50 No. for GC with ECD, NPD, FID	
	Columns for GC Applications	• Pesticide column (30m x 0.250mm x 0.25µm (HP-5MS / DB-1MS or equivalent) (02 no.) • Column for Fatty Acid Profiling with main concern of Trans Fatty Acid Application (02 No.) • Column for Cholesterol Application (02 No.)	
	Vials, caps and tool for autosampler *(Only Compatible sizes should be supplied)*	• 2000 No. each Vial sets (1, 2 mL, Crimp type, Amber and Clear glass) • 200 No. Vials (10,20ml Crimp type with cap & septa) • 1000 No. 300/500 µL Recovery vials • 6000 No. Septa PTFE/Silicone (for 1, 2 mL Vials) • Ergonomic Crimping Tools for different vial types • Ergonomic Decapping Tools for different vial types • 10 No. each Storage Racks for (for 1, 2 mL Vials)	
	Autosampler Syringe	10 µL (12 No.), 100 and 250 µL (04 No. each); Manual syringe-2µl, 5µl and 500 µl (04 No. each).	
	Sample Preparation *(Water & Food)*	QuEChERS Kits for Pesticides and Herbicides in following Matrices: • Water (1000 No.) • Matrices with high fat (1000 No.) • Matrices with high Water content and (1000 No.) • Matrices with high pigmented (1000 No.)	
	Tools and Kits	Septa Removing tool	
		Tubing Cutter with rotating diamond blade for column	
		Tubing Cutter for stainless steel tubing (1/16 & 1/8 inch tubing)	
		Tubing Cutter for Plastic tubing with spare blade set	
	Miscellaneous	Consumables required for each detector must be provided	

Sl.No	Item	Specifications	Price in INR
	Warranty	Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.	
7.	**MICROWAVE DIGESTION SYSTEM**	A latest model of microwave digestion system should enable rapid digestion for different inorganic/organic samples like; Different types of FSSAI food and food products, Fish and Fishery products, tea, seasoning powder, biscuits etc.	
	Application	A latest model of microwave digestion system should enable rapid digestion for different inorganic/organic samples like; Different types of FSSAI food and food products, Fish and Fishery products, tea, seasoning powder, biscuits etc•	
	General	The instrument should have a superior pressure venting so as to prevent any loss of volatile metals and should have homogeneous microwave field to avoid sample burning	
	System	Microwave digestion system should have temperature and pressure controlling/monitoring system. The system should be software controlled. Different types of rotors available for the digestion of the different type samples should also be quoted. Necessary consumables and maintenance parts should also be quoted to run instrument trouble free	
	Instrument	The system should be a stand alone work station and should have • The System should have the feature of simply choose a method and it automatically recognizes the vessel type, counts the vessels and determines all of the parameters necessary for a fast, complete digestion • Should have provision that user can set the desired parameters for digestion • Should have Automatic Microwave power application depending on the load • Auto sensing of temperature and pressure inside the vessel • Be capable of processing different amounts of samples (from 0.3 g up to 10g) in the same run assuring the same conditions of temperature and pressure	
	Display	The Instrument should have the high-resolution, colour touch screen, acid resistant, LED/LCD screen should serve as controller and display. Should be provided training videos for sample preparation vessel assembly, system use, and maintenance. Should have Data management – Easy access to stored methods, real-time data and results of past runs. Should be able to display the detailed methods, graphs o f temperature and	

Sl.No	Item	Specifications	Price in INR
		power against time and temperature of individual vessels.	
	Interlocks	The system should have good interlocking system for safety and cavity door.	
	Vessel	The system should be high throughput which can hold atleast 24 high pressure vessels. Must be supplied with digestion vessel racks and suitably handle different digestion volumes.	
	System	The material of construction should be high purity TFM fluropolymer. Vessel should be capable of hanlding volumes between 10 ml and > 25 ml, if required. It should be operated for maximum temperature capacity of 250ºC or more and maximum pressure of 35 Bar or more. The system should be provided with temperature sensor (Thermocouple type/ Fiber optics/IR Sensor) which will measure real temperature of the vessels and control it. The vessels should have automatic venting and re-sealing system in case there is excess pressure development essential. After Digestion, vessels must be vent-able before uncapping the vessel for safety reasons. For ease of use, the vessels must not require the use of an energizing tool in order to reform seals prior to operation. Additional twelve numbers of vessels should be supplied along with the system.	
	Microwave Power and output with uniform energy distribution	The Instrument should have single/dual magnetron 1500 W (or more of delivered energy, should provide the temperature needed (300 °C) for difficult samples and high-throughput vessel sets delivering unpulsed continuous power & precisely tuned wave guide. Disperses microwave energy uniformly throughout the cavity. No need for motor driven diffusers or attenuators. System software must automatically adjust the power delivery based upon sample load and pre-programmed control settings. Automatic Power control Technology delivers maximum energy to the sample, ensuring complete digestions. Controllable via microprocessor 230 V input, pulsed and unpulsed-essential 50 Hz, AC Operated. The Instrument should have “waveguide” between the magnetron (the microwave energy source) and the cavity. This waveguide fed system should provide maximum tuned transfer of microwave energy from the magnetron to the load in the microwave cavity. planes. This should result in uniform heating of the sample load.	
	Microwave Cavity	The microwave cavity should be heavy duty and have sufficient space to mount and dismount vessels individually and all parts inside the cavity should be totally microwave transparent. The	

Sl.No	Item	Specifications	Price in INR
		Cavity should be constructed with non magnetic Rugged high-grade 316 solid steel cavity. The vessel assembly during a run should be visible from outside The coating inside the cavity should be acid/ chemical. resistant special polymer coating like fluro-polymer / PTFE.	
	Controls	The Instrument should have a) Reliable Temperature and b) Pressure controls independent of each other • Automatic temperature control system, temperature sensor should be protected properly from any chemical attack, sensor should monitor and control all vessels simultaneously-essential • Automatic Pressure control: should have a pressure sensor which has a total capability of up to 500psi automatically control the pressure. It should be possible to remove the pressure device at a high pressure. The Vessels should act as self-regulators of pressure	
	Control	The control terminal should have high resolution LED/LCD Acid Resistant display. Touch screen which should have method storage capacity. All the features should be in built in the software. Should have provision for manual programming storage apart from pre-installed programme. Continuous display of temperature and power inside the reaction vessels is required.	
	Safety	There has to be multiple levels of safety. A safe mechanism to tackle the unused or reflected microwave energy Capable of shutting off in the event of the A very loud noise or bang in the instrument. If the temperature of the vessel is near its highest tolerance limit. Have inbuilt exhaust system to cool the vessels and to drive away if any fumes in the cavity-essential	
	Quality Standards	The manufacturer should be ISO 9001 certified for design and manufacture of microwave digestion system	
	Certification required for sign off	• IQ/OQ compliance • Calibration certificates for titrator • GLP-validated software for controlling the system	
	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.	

Sl.No	Item	Specifications	Price in INR
	Warranty	Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered. This will include yearly calibration start-up / commissioning routine servicing, regular maintenance, preventive maintenance of equipment and components and break down repairs as and when occurring, ensuring that system does not remain out of service for a period more than 24 hours in case of major breakdowns and 6-8 hour in the case of minor breakdowns due to any unforeseen break down. The institution will provide Water / Electricity power, etc. for maintenance work. The successful tenderer shall keep the essential spares at site during the Contract Period to avoid the delay in attending faults / maintenance.	
	Service contract clauses, including prices	List of all spares and accessories (including minor) with part numbers and price, required for maintenance and repairs in future after guarantee/warranty period should be attached.	
	Operating manuals, service manuals, other manuals	Should provide 2 sets (hardcopy and soft-copy) of:- • User, technical and maintenance manuals to be supplied in English language along with machine diagrams; • List of equipment and procedures required for local calibration and routine maintenance; • Service and operation manuals (original and copy) to be provided; • Advanced maintenance tasks documentation; • Certificate of calibration and inspection	
	Certificates Performance and safety standards (specific to the device type);Local and/or international	• Should be FDA/CE/BIS approved product. • Manufacturer and Supplier should have ISO 13485 certification under ISO 9001for quality standards. • Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements (or equivalent BIS Standard) • Certified to be compliant with IEC 61010-1, IEC 61010-2-40 for safety	
	Supplier/ Manufacturer	• Must be ISO certified for quality	
	Service Support Contact details (Hierarchy Wise; including a toll	• Contact details of manufacturer, supplier and local service agent to be provided; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer;	

Sl.No	Item	Specifications	Price in INR
	free/landline number)		
	Recommendations or warnings	• Any warning signs would be adequately displayed	
8.	**DIGITAL BUTRYO REFRACTOMETER**	For checking purity and adulteration of fats and oils	
	System	Automated Operating LCD screen directly without manual alignment, can connect PC with RS232 interface	
	Display	The required data to be displayed on the screen, including: the date, temperature, refractive index, concentration, and amended in accordance with the current temperature	
	Measurement Range (Automatic Temperature Controlled)	• Concentration 0;95% • Refractive Index 1.32422—1.7000	
	Minimum Indication	Butyro 0.1% RI 0.00001	
	Measurement Accuracy	Butyro ±0.5% (at 40˚C) RI ±0.0003 (at 40˚C)	
	Precision (Reproducibilty	RI ± 0.00005 Butyro ± 0.05	
	Measurement Temperature	• 10 to 50˚C	
	Ambient Temperature Sample	• 10 to 40˚C	
	Volume Measurement Time	Less than 5 sec	
	Sample Volume	> 0.1 ml	
	Calibration certificate		
	Accessories	Reference Material Oil minimum 10 ml	
	Operation and training component	• The supplier will have to carry out successful Installation at the laboratory premises (where ever the system has to be installed) and provide on – site comprehensive training for a minimum of two scientific personnel operating the system till customer satisfaction	
	Certificates Performance and safety	• Should be FDA/CE/BIS approved product.	

Sl.No	Item	Specifications	Price in INR
	standards (specific to the device type);Local and/or international	• Manufacturer and Supplier should have ISO 13485 certification under ISO 9001for quality standards. • Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements(or equivalent BIS Standard) • Certified to be compliant with IEC 61010-1, IEC 61010-2-40 for safety	
	Supplier/ Manufacturer	• Must be ISO certified for quality	
	Service Support Contact details (Hierarchy Wise; including a toll free/landline number)	• Contact details of manufacturer, supplier and local service agent to be provided; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer;	
	Recommendations or warnings	• Any warning signs would be adequately displayed	
	Warranty	Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.	
	Service contract clauses, including prices	• List of all spares and accessories (including minor) with part numbers and price, required for maintenance and repairs in future after guarantee/warranty period should be attached;	
	Operating manuals, service manuals, other manuals	Should provide 2 sets(hardcopy and soft-copy) of:- • User, technical and maintenance manuals to be supplied in English language along with machine diagrams; • List of equipment and procedures required for local calibration and routine maintenance; • Service and operation manuals (original and copy) to be provided; • Advanced maintenance tasks documentation; • Certificate of calibration and inspection	
9.	**Flash point apparatus**	• Instrument designed in strict accordance with the test method ASTM D93, Method A and B. • Microprocessor controlled unit with digital easy to read display of the results. • Ignition :-Electric ignition and should also provide an automatic reignition facility.	

Sl.No	Item	Specifications	Price in INR
		• Thermal detection (with metal sample temperature probe) of the flash to eliminate interference from water or silicone containing compound. • Cooling : - Facility for built-in cooling connection. • Automatic correction for standard barometric pressure vis-à-vis with final result. • Unit should have diagnostic program to check every key component and assembly and calibration facility. • Unit should automatically determine flash point in strict compliance with the appropriate test method. • Heating should be microprocessor controlled at the specified rate; the ignitor is activated and dipped at precisely the correct temperature and frequency. • Safety device for fire protection with alarm. • Resistance check box for temperature calibration with calibration certificate. • The unit should be operable on 230v / 50 Hz. • The system should be ISO 9001 quality standard and supplied with operation manual. • Merely copying our specifications in the quotation shall not make the parties eligible for consideration of the quotation. A quotation has to be supported with the printed technical leaflet/literature of the quoted model of the item by the quoting party/manufacturer and the specifications mentioned in the quotation must be reflected/supported by the printed technical leaflet/literature. • Calibration : The firm must ensure that the equipment supplied is fully calibrated as per specification requirements and also source of future calibration at New Delhi & their frequency of calibration needed • Spares : Vendor should quote recommended spares for two years alongwith the equipment for smooth functioning of the equipment. • Spare Parts : Availability of spare parts of the equipment/instrument must be guaranteed for a period of at least seven years from the date of supply. • After Sales Services: It should be clearly mentioned in the quotation whether the after sales services during and after the completion of warranty shall be provided directly by the supplier or their authorized agent/ representative. Terms of the after sales services, if any, may be mentioned in the offer.	

Sl.No	Item	Specifications	Price in INR

		However, in both the cases the original supplier shall be responsible for poor performance/services.
		• Inspection: The inspection of the system will be done by our technical expert in the presence of firm representative.
		• Users List : The list of users specifically for the same model/make of the quoted item (not the list of general users) along with the complete name, address & contract numbers of the user organizations/persons may be submitted with the quotation along with the performance certificates from all/some of them.
		• Training: Our Scientist/Technical persons should be trained by the supplier at the project site free of cost. NOTE:- Firms having equipment wherein single mother unit can be used for carrying out Flash Point by Abel Flash Point using interchangeable analyzer unit shall be considered, if otherwise found suitable vis-à-vis price factor & performance. Other specification requirement for Abel Flash Point apparatus is enclosed.
		• Certifications:
		  • Product certification: CE / US FDA / BIS certified.
		  • Quality Certification: ISO certified.
		  • Should provide calibration certificates from NIST traceable calibration solutions by any agency every year during warranty & CMC period. Calibration cost will have to be borne by the supplier.
		• Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered.
		• Buy-back price for old Automated Pensky-Martens closed-cup flash point tester with sample changer measures the flash point of up to 12 samples automatically [Make: Petrotest, Germany Model: PMA-4, Year of Installation: 2004] may also be quoted.	

10.	**Water Purification system**	Table top Water Purification System (Tap Water Feed) should be capable of produce water for use in HPLC solvents, Microbiology and reagent grade with the help of pre-treatment module; RO Module, DI Module, Storage tank, UV Oxidation Chamber, Polishing module and final membrane filter 0.22um	
	Pre-treatment System	Should consists: • 5 micron,1 micron and Activated Carbon wrapped type depth filter • Pressure gauge with regulator	

Sl.No	Item	Specifications	Price in INR
		• The unit should have automatic low/high pressure cut-off	
	Reverse Osmosis with Electro Deionization Stage:	▪ Pre-treatment cartridge with auto-scaling compounds, 0.5 micron filter and activated carbon or better. ▪ Prefilter combination to protect the RO Membranes life or better. ▪ RO Module with high performance thin film composite membrane with salt retention rate up to 98%. The retention rate for dissolved organic compounds, particles & colloids & bacteria exceeds 99% ▪ Deionization Module: Mixed bed resin module utilized for a reduction of the inlet conductivity. Used for inorganic applications. ▪ Conductivity measurement is to be done after RO, DI & Polishing module to monitor the performance of Individual cartridge. ▪ Should have suitable back wash programme before every operation or better	
	Storage Tank:	• 30 L or better Storage Tank with UV Lamp, Air filter, CO2 Trap & Level Sensor. • The tank should made of pure water resistant Poly Ethylene material with an outlet to drain the tank totally and a pressure sensor for the tank level control • The storage tank should be 100% drainable.	
	General requirements	▪ Online UV oxidation chamber: UV Light Energy at 185 nm & 254 nm wavelengths. ▪ TOC Measurement: Online continuous TOC measurement with Live Display. ▪ Sterile Filter with 0.22 µm or better with Autoclavable option for re-use ▪ System should meet reagent water quality standards including ASTM Type 1, CLSI and ISO 3696 Type I ▪ System should have flexible remote dispenser to dispense water whenever needed ▪ System should have built-in automatic self-cleaning mechanism to extend the life of cartridge ▪ Automatic flushing and recirculation in standby mode to maintain consistent peak water purity ▪ User can collect RO Quality water from the Storage tank & ultrapure water from flexible dispenser ▪ Should have cartridge change indicator ▪ The system should incorporate a fully comprehensive, graphic colour LCD display to provide system status, performance parameters, routine maintenance status and alarms of	

Sl.No	Item	Specifications	Price in INR
		troubleshooting, tank level status and automatic warning of reordering of consumables and ▪ Provision for digital display to indicate status of operation, resistivity or conductivity, temperature and also alarm system in case of malfunctioning.	
	Pure Water Specification: (Type-2)	• Production Rate : 10 LPH or better • Conductivity : <2µs/cm at 298K (25°C) or better • pH at 298K (25°C) => 6.6 or effectively neutral • Total silica max 3ug/L or better	
	The Ultrapure Product Water should of the following specifications: (Type-1)	• Flow Rate : 1.0 L/min or better • Should have conductivity @ 25 Deg C : 0.055 µs/cm or better • Should have resistivity @ 25 Deg C : 18.2 MΩ-cm or better • TOC : < 1 ppb or better • Bacteria : <1 cfu/ml or better • Particles >0.1µm : <1 per ml or better • pH at 298K (25°C) = > 6.6 or Effectively neutral	
	Certification required for sign off	• IQ/OQ compliance • Calibration certificates for titrator	
	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.	
	Warranty	Comprehensive warranty with spares for five years from the date of installation of the instrument should be covered. This will include yearly calibration start-up / commissioning routine servicing, regular maintenance, preventive maintenance of equipment and components and break down repairs as and when occurring, ensuring that system does not remain out of service for a period more than 24 hours in case of major breakdowns and 6-8 hour in the case of minor breakdowns due to any unforeseen break down. The institution will provide Water / Electricity power, etc. for maintenance work. The successful tenderer shall keep the essential spares at site during the Contract Period to avoid the delay in attending faults / maintenance.	
	Service contract clauses, including prices	List of all spares and accessories (including minor) with part numbers and price, required for maintenance and repairs in future after guarantee/warranty period should be attached;	
	Operating manuals,	Should provide 2 sets(hardcopy and soft-copy) of:-	

Sl.No	Item	Specifications	Price in INR
	service manuals, other manuals	• User, technical and maintenance manuals to be supplied in English language along with machine diagrams; • List of equipment and procedures required for local calibration and routine maintenance; • Service and operation manuals (original and copy) to be provided; • Advanced maintenance tasks documentation; • Certificate of calibration and inspection	
	Certificates Performance and safety standards (specific to the device type);Local and/or international	• Should be FDA/CE/BIS approved product. • Manufacturer and Supplier should have ISO 13485 certification under ISO 9001for quality standards. • Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements (or equivalent BIS Standard) • Certified to be compliant with IEC 61010-1, IEC 61010-2-40 for safety	
	Supplier/ Manufacturer	• Must be ISO certified for quality	
	Service Support Contact details (Hierarchy Wise; including a toll free/landline number)	• Contact details of manufacturer, supplier and local service agent to be provided; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer;	
	Recommendations or warnings	• Any warning signs would be adequately displayed	
	GROSS TOTAL (A)		
	BUY BACK		
1.	Buy-back price for old Atomic Absorption Spectrophotometer [Make: GBC Scientific Equipments, Australia, Model: Avanta PM and System AVANTA ULTRA Z1 & PAL4000 Auto-sampler Year of Installation: 2001].		
2.	Buy-back price for old Digital Lovibond Tintometer [Make: Tintometer Ltd., U.K. Model: PFX 995 Year of Installation: 2003].		
3.	Buy-back price for old Muffle furnace [Make: Heraeus Instrument, Germany Model: M110, Year of Installation: 2000].		
4.	Buy back price for old Gas Chromatograph – Mass Spectrometer (GC / MS) With Headspace (HS) sampler, ECD, FID and Single Quadruple MS detector [Make: Perkin Elmer USA Model: Clarus® 500, Year of Installation: 2006.		
5.	Buy Back Price for old Microwave Digestion System [Make: CEM Corp., USA Model: MARS 5, Year of Installation: 2008.		
6.	Buy back price for old Refractometer [Make: Bellingham Stanley, U.K. Model: RFM 330, Year of Installation: 1996.		

Sl.No	Item	Specifications	Price in INR
7.	Buy-back price for old Automated Pensky-Martens closed-cup flash point tester with sample changer measures the flash point of up to 12 samples automatically [Make: Petrotest, Germany Model: PMA-4, Year of Installation: 2004].		
8.	Buy Back price for old Deionized water generation system [Make: Millipore**,** U.S.A Model: ELIX 3, 10 AND MILLI Q, Year of Installation: 2008.		
	Buy Back Total (B)		
	Net Amount (A-B)		

Note1:

(a) The financial bid has to be filled necessarily in the format given above and has to be signed by the authorized representative of the bidder with full name designation and seal on each page. The above quote should include Clearing and Transportation charges and cost of necessary civil/electrical work required for installation of equipments to be carried out by the successful bidder.

(b) The bidder has to quote price for all the items mentioned above. In case bidder fails to quote price for all the items his bid will not be considered for evaluation. Consortium is allowed as a single entity or a subsidiary

(c) Price quoted should be valid for minimum 06 months from the last date of submission of the bids.

(d) Explanatory notes, if so desired, can be separately submitted along with the financial bid but financial bid in the above format is required to be submitted.

(e) Equipment delivery time will be 90 days from the date of issue of Supply order.

(f) Please indicate separately any duties, taxes.

Note 2 : The rate may be quoted in foreign currency and/or in Indian currency, however, for comparison/evaluation purpose the bills selling market rate of exchange established by RBI for similar transaction as on date of opening of price bid shall be used to convert foreign currencies to the Indian rupees.

Note 3 : Determination of L-1 will be done based on Net amount after Buy Back adjustment (not including levies, taxes and duties levied by Central/State/Local governments such as excise duty, GST, Octroi/entry tax, etc. on final product) of all items/requirements as mentioned above.

Signature of tenderer_____
Name in Block letter _____
Date _____
Capacity in which Signed_____

Sd/-

(Umesh Kumar Jain)
Joint Director(QA)

Revised Annexure: II

CERTIFICATE OF GUARANTEE/WARRANTY

i. I/We certify that the standard guarantee/warranty shall be for a period of 05 years starting from the date of satisfactory installation, commissioning and handing over of the equipment and of the works conducted therewith covered under the Supply order in working order. During the guarantee/warranty period. I/we shall provide free "after sale service" and the replacement of any part(s) of the equipment or rectification of defects of work of the equipment will be free of cost. The replacement of the parts shall be arranged by us, at our own cost and responsibility. We undertake that the above guarantee/warranty shall begin only from the date of satisfactory and faultless functioning of the equipment at **CFL, Kolkata** premises. The benefit of change in dates of the guarantee/warranty period shall be in the interest of the user/your organization.

ii. During the warranty period, we shall provide at least **02 preventive maintenance service per year**.

iii. Uptime Guarantee: During the guarantee/warranty period, we will be responsible to maintain the equipment in good working conditions for a period 328 days (i.e. 90**% uptime**) in a block of 365 days, for 05 years.

   a. All the complaints will be attended by us within 03 working days of receipt of the complaint in our office.
   b. In case there is delay of more than 03 days in attending to a complaint from our side then you can count the number of days in excess of the permissible response time in the downtime. The above said response time of 03 days for attending to a complaint by us will not be counted in the downtime.
   c. **Penalty**: We shall pay a penalty equivalent to **0.5 %** of the order value of the equipment for every week or part thereof delay in rectifying the defect.

Note: The right to accept the reason (s) for delay and consider reduction or waive off the penalty for the same shall be at the sole discretion of Director, CFL, Kolkata

iv. We undertake that all the spares/consumables related to equipment & exclusively supplied by manufacturer/supplier of the equipment shall be covered under warranty. Nothing shall be payable on account of these items during warranty by the Buyer.

v. We certify that the equipment being/quoted is the latest model and that spares for the equipment will be available for a period of at least 10 years and we also guarantee that we will keep the organization informed of any up date of the equipment over a period of 5 years.

vi. We guarantee that in case we fail to carry out the maintenance within the stipulated period, **Director**, **CFL, Kolkata** reserves the right to get the maintenance work carried out at our risk, cost and responsibility. All the expenses including excess payment for repairs/maintenance shall be adjusted against the Performance Bank Guarantee. In case the expenses exceed the amount of Performance Bank Guarantee, the same shall be recoverable from us with/without interest in accordance with the circumstances.

vii. We shall try to repair the equipment at **CFL, Kolkata** premises itself. However, the equipment will be taken to our site on our own expenses in case it is not possible to repair the same at **CFL, Kolkata**. We shall take the entire responsibility for the safe custody and transportation of the equipment taken out for repairs till the equipment is rehabilitated to the **CFL, Kolkata** after repairs Any loss of equipment or its accessories under its charge on account of theft, fire or any other reasons shall be at our sole risk and responsibility which will be

compensated to the Buyer for such losses at the order value for the damaged/lost equipment/part, including accessories.

viii. We undertake to perform Quality check after every major repair/breakdown/taking the equipment for repair out of **CFL, Kolkata** premises.

ix. In case of extended guarantee/warrantee, we undertake to carry out annual calibration/IPV of the equipment.

x. We guarantee that we will supply spare parts if and when required on agreed basis for an agreed price. The agreed basis could be an agreed discount on the published catalogue price.

xi. We guarantee to the effect that before going out of production of spare parts, we will give adequate advance notice to you so that you may undertake to procure the balance of the life time requirements of spare parts.

xii. We guarantee the entire unit against defects of manufacture, workmanship and poor quality of components.

xiii. We undertake to provide PM kit as per requirement to meet uptime guarantee condition.

1. Authorized signatory
(with seal)

Date

Place

2. Authorized signatory

NOTE:

1. This should be submitted on the letter head of the bidder company/firm.