File No. 11023/19/2019-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 14th August, 2019

RFP No. 08/2019-20 EMAPNELMENT FOR SETTING UP OF BASIC FUNCTIONAL LABORATORY: CORRIGENDUM -03

Further to this office Tender Enquiry No. 08/2019-20 dated 30th May 2019, pre-Bid held on 12th June 2019 and Corrigendum -01 dated 04th July 2019 and Corrigendum-02 dated 06th August 2019, the following amendment are made in the *ibid* tender:

PART I – GENERAL INFORMATION AND INSTRUCTIONS

1. **Last date and time for depositing the Bids:** **30th August 2019 by 1500 Hrs.** The sealed quotations under two bid system (i.e. Technical Bid & Commercial Bid) in sealed covers should be deposited/reached by the due date and time. The responsibility to ensure this lies with the Bidder.

4. **Time and date for opening of Bids:** The tender box will be opened on **30th August 2019 at 1530 hrs**. (If due to any exigency, the due date for opening of the Technical-Bid is declared a closed holiday, then it will be opened on the next working day at the same time or on any other day/time, as intimated by this office).

PART II – ESSENTIAL DETAILS OF ITEMS/SERVICES REQUIRED

6. **Eligibility Criteria for Pre-Qualification of Bidders**. The firm/Bidder fulfilling the following eligibility criteria will be considered for opening of their Commercial Bids: -

(e) Bidder should have sufficient experience of setting up of Basic Laboratory(satisfactorily work completion Certificate to be attached). **At least one work order of Setting up of Basic Laboratory should have been completed in the Government sector.**

10. **Bid Form**

TECHNICAL BID FORM (B)

1. ANALYTICAL BALANCE

Sl. No.	Specifications	Requirement	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
1	Application	Required to measures mass to a high degree of precision with a **weighing** capacity typically 200 g and a readability of 0.1 mg and protected by a draft shield or an enclosure.		
2	Operational Requirements	• Microprocessor based single pan top loading analytical balance with high accuracy and precision.		

		• Reading of the weight by digital display • Balance with transparent case. • Weighing with automatic and manual start and provision for data interface.		
3	**Technical Specifications**	• Weigh accurately up to 3rd decimal place. • Fully automatic time and temperature controlled internal calibration and balance should be capable to adjust itself Auto zero setting. • Weighing capacity up to 200g Readability 0.1 mg Repeatability 1 mg or less. Setting time less than 03 secs.		
4	**Balance should have**	• Fast dismantling chamber for easy clean up		
5	**Environmental factors**	• Safety for electromagnetic compatibility. • The unit shall be capable of operating in ambient temperature of 20-30 deg C and relative humidity of 80%.		
6	**Accessories**	• All necessary accessories should be provided with unit.		
7	**Calibration certificate**	Certificate from a ISO 17025 accredited lab for 3 different weights.		
8	**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		
9	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: 2016 certification under ISO 9001: 2015 for 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		
10	Supplier/ Manufacturer	• Must be ISO certified for quality and their last audit report for ISO standard		

11	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;		
12	Recommendations or warnings	• Any warning signs would be adequately displayed		
13	Warranty	• Warranted for 03 years after satisfactory installation and working excluding consumable parts and accessories.		
14	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;		
15	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		

2. <u>DIGITAL BALANCE 500 GM</u>

Digital Precision Balance along with Standard Weight Box of E2 Class (1 Weight Box) traceable to National / International Standards should offer the followings features:

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification(Yes/No)	Specify Make and Model
1.	Design	Type – Top loading Precision Balance of 500gm Capacity		
2.	Range (weight)	0.001gm - 1200gm		
3.	Accuracy	0.01gm		
4.	Readability	0.001gm		
5.	Repeatability	0.001gm		
6.	Linearity	0.002gm		
7.	Response time	Less than 3 sec		
8.	Calibration	automatic/internal		

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification(Yes/No)	Specify Make and Model
9.	Display	Touch Screen		
10.	Stabilization Time	2 Seconds (typically).		
11.	Calibration certificate	From NABL accredited calibration laboratory should be supplied along with the eqp.		
12.	Specifications of Weight Box traceable to international standards (1 no)	1. 1 mg - 200 g, E2 2. Accuracy class acc. to OIML R111: E2 3. Nominal mass value: 1mg to 200g. Up to 500 mg as wire weights 4. Susceptibility: 0.002 – 0.004 5. Material: special steel, non-magnetizable, density 8.0 g/cm3, highly corrosion-resistant, knob weights highly polished and laser marked, in wooden case. 6. Dust Cover		
13.	Warranty	Minimum 03 years warranty		

3. <u>HOT AIR OVEN</u>

Hot air oven should offer the followings features:

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
1.	**External material**	304 Grade Stainless Steel body.		
2.	**Interior material**	Fully stainless steel.		
3.	**Inner chamber**	Stainless steel structure with adjustable minimum 2 shelves.		
4.	**Window**	Double layer glass observation window in front side.		
5.	**Type**	Bench Top type (Table top model).		
6.	**Minimum Dimension (W×D×H)**	1. Interior (mm) 400×360×420 2. Exterior (mm) 577×642×760		
7.	**Capacity**	60-70 Ltrs.		
8.	**Temp. Range**	Ambient +10°C to +250°C		
9.	**Temperature Accuracy**	±1°C		
10.	**Temperature Protection**	Automatic over temperature alarm based protection system.		
11.	**Timer function**	Choice of time (On/Off condition) for automatic setting.		

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
12.	**Temp. Control**	Microprocessor control with LCD/ LED display.		
13.	**Convection system**	Gentle drying and heating with superior temperature uniformity.		
14.	**Warranty**	Minimum 03 years warranty against all manufacturing defects.		

4. MUFFLE FURNACE

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
		1. 1200 degree with 23-liter capacity or more 2. Double Shell case, Stainless Steel 3. High Purity insulation material with efficient low thermal insulation 4. Bench top model 5. Vertically lift break switch/side lift break with front loading 6. Door: positive break switch Inside 7. Chamber Size: 245-280 mm x 340-400 mm x 230-250 mm (WDH) 8. Maximum temperature: 1200^{o}C Standard continuous temperature 1050 ^{o}C or more 9. Heating Rate: The furnace should be fast heating type with maximum attainable temperature should reach in 120 mins or better 10. 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 11. Temperature Accuracy: ± 5^{o}C over the whole temperature range of operation and in the entire muffle 12. Safety: Over Temperature protection should be added 13. Gas purging: Gas purging facility (inert gas inlet and outlet) 14. The furnace should be CE certified with suitable power supply 15. Installation, training and commissioning: Vendor must ensure satisfactory installation and commissioning of the system. 16. For validation vendor should have its own capability with their own company,to perform validation or a third party validation will be entertained. One validation at the time of installation should be done. 17. Warranty: Comprehensive warranty with spares for 03 years from the date of installation of the instrument should be covered.		

5. Fume Hood With Heavy Duty High Suction

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
Fume Hoods with floor mounted systems designed to meet the challenges when working with chemicals, chemical fumes and other flammable materials etc. with a high degree of efficiency. • **Exterior Design and Structure** Fume hoods should be designed such that automatic bypass airflow to the suction system with double walled construction to provide easy maintenance and access to concealed service fixtures and utilities like water, gas, vacuum and electricity connections. • **External Dimensions** (W x D x H) mm: 1500 x 900 x 2300 **Internal Dimensions** (W X D X H) mm 1200 x 750 x1200 **Outer body** should be made of Power Coated Electro Galvanized Steel (P.C.G.I). **Air Flow Type**: Constant Air Volume (CAV) type with automatic by pass. **Interior Construction and Liners**: Standard Model with thick Water/Heat/Fire Resistant Phenolic Resin Lamination **Work Surface (Worktop):** Work surface made of Granite. Support Base with storage cabinet. Detachable base storage cabinet to accommodate the fume hood at its top. The storage cabinet at base to store chemical or apparatus and fitted with exhaust port connected internally to, work in tandem with the main exhaust system. **Electric Supply Socket:** Two sockets to be located on the side panel for optimum convenience of using small electrical devices inside the cabinet **Front Counterbalanced Sash/ Shutter**: A vertical rising sash/ shutter consist of a thick toughened transparent glass/ window for a clear inside view. The sash should be counterbalanced for smooth and light weight operation for easier access to work zone and enhanced user safety. Sash (Shutter): Vertical rising movement with toughened transparent glass Sash (Window): Made of 6-8 mm thick toughened transparent glass **Apparatus Holding Grid**: Apparatus holding grid for easy clamping/ holding to various laboratory glassware's and accessories. **Sink With Water Tap Connection**: The worktop with a PP sink for drainage with a water tap for remote handling. **Service fixture**: Colour coded remote valves with degree nozzle (one set of water and one set for air/gas) Nitrogen Valve with degree nozzle and Vacuum Valve with degree nozzle **Baffle Arrangement**: Three point suction system (for light, normal & heavy fumes) with baffle to ensure smooth and immediate exhaust of fumes. **Exhaust Blower & Motor: Blower**: Centrifugal Type, Motor : 1.0 HP motor (3 phase, 50Hz, AC Supply) with phase MCB.			

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
	Direct Driven, totally enclosed fan-cooled (TEFC), Squirrel Cage Induction Motor **Interior Illumination**: Inner Chamber should be fitted with vapor proof incandescent lamp for clearer and brighter chamber vision **Manual and documentation:** All the manuals necessary for operating and servicing the equipment (including details of electronic circuits) will have to be provided along with the instrument. **Warranty Declaration**: Bidders must give the comprehensive on-site warranty for 03 years from the date of successful installation of Equipment against any manufacturing defects and also give the warranty declaration that "everything to be supplied by us hereunder shall be free from all defects and faults in material, workmanship and shall be of the highest quality and material of the type ordered, shall be in full conformity with the specification and shall be complete enough to carry out the experiments, as specified in the tender document.			

6. <u>pH METER</u>

pH / ORP Meter should offer the followings features:

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
1.	Benchtop GLP Model pH cum ORP meter with digital pH electrode having built-in temperature sensor with Clogging Prevention, glass body, and spherical tip.			
2.	pH Range	-2.000 to 16.000 pH		
3.	pH Resolution	0.001 pH, 0.01 pH		
4.	pH Accuracy (@25ºC/77ºF)	±0.01 pH, ±0.002 pH		
5.	pH Calibration 5 points (Standard mode)	1.68, 4.01 (3.00†), 6.86, 7.01, 9.18, 10.01, 12.45, and two custom buffers; 3 points (Basic mode) 4.01; 6.86; 7.01; 9.18; 10.01		
6.	pH Temperature Compensation ATC	-5.0 to 100.0ºC; 23.0 to 212.0°F		
7.	mV Range	±1000.0 mV; ±2000.0 mV		
8.	mV Resolution	0.1 mV		
9.	mV Accuracy	±0.2 mV (±999.9 mV); ±1 mV (±2000 mV)		

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
10.	Temperature Specifications	1. Temperature Range -20.0 to 120.0 ºC 2. Temperature Resolution 0.1 °C 3. Temperature Accuracy ±0.5 °C 4. °C/°F Yes		
11.	pH Electrode Diagnostics	Glass and reference junction diagnostics, out of calibration range , probe condition, response time		
12.	Logging	up to 1000 records organized in: Manual log-on-demand (Max. 200 logs), Manual log-on-stability (Max. 200 logs), Interval logging (Max. 600 samples; 100 lots)		
13.	Connectivity	1 micro USB port for charging and PC connectivity, 1 USB port for storage		
14.	Environment	0 to 50°C (32 to 122°F), RH max 95% non-condensing		
15.	Accessories	1. Cradle and Electrode Holder, 2. Compatible pH and ORP electrode with inbuilt temperature sensor 3. Buffer solutions for pH 4, 7 and 10 4. Cleaning solutions, battery Charger 5. Dust Cover		
16.	Warranty	03 years including probe		

7. TURBIDITY METER

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
Range: 0 - 1000 NTU **Automatic Range Selection:** 0.01 to 19.99 NTU, 20.0 to 99.9 NTU, 100 to 1000 NTU **Accuracy:** ± 2% of reading ± 1 digit for 0 – 500 NTU ±3%of reading ±1 digit for 501 – 1000 NTU **Response Time**: less than 6 seconds **Calibration:** 4 points **Calibration kit** set 3 sample vials			

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
	Resolution: 0.01 NTU (0 to 19.99 NTU), 0.1 NTU (20 to 99.9 NTU), 1 NTU (100 to 1000 NTU) **Display**: Digital LED **Connectivity:** RS232 interface **Light Source:**Infra Red Emitting diode Power supply 4 x 1.5V 'AAA' alkaline batteries Warranty period: 03 years		

8. CONDUCTIVITY AND TDS METER (DIGITAL) WITH ELECTRODE

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
	Range;- Conductivity:0-200 mS; TDS: 0-200ppt; **Temp.**:10-90 C. **Resolution:-** Temp.:0.1; **Conductivity** :0.01µs to 200.0m S/cm**TDS**:0.01 ppm to 0.1 ppt. **Accuracy:** T emp.: ± 0.5 °C; **Conductivity**: ±1% full-scale; **TDS**:±1% full-scale; Calibration: One point per range **Ready indicator** let you know when readings are stable Selectable cell constant **Auto-ranging across** 5 Conductivity and TDS ranges Up to 5-point push button calibration **Non-volatile memo**ry holds up to 100 data points **Integral electrode holder** **Warranty** 03 years on meter against manufacturing defect and 06 months for electrode.		

9. MAGNETIC STIRRER

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
	Work Plate Material-- Stainless steel with ceramic coated **Max. Stirring Quantity**: [H2O], 10----20 Litre **Speed and Temperature Display** –LCD/ DIGITAL **Heating Power in Watt**—>800 **Max. Work plate Heating Temperature[□C]**-- 340□C or better **RPM**--100- 1500 with speed accuracy ±2 % with digital display **RS232 Interface**—yes **External temperature sensor** PT1000 is available for hotplate model, real-time controls medium temperature. **PID temperature technology** precise controls heating process, rapidly reaches target temperature and enhances control accuracy. **Brushless DC motor** maintenance free and explosion proofed, accurately control speed **Separate safety circuits**, fixed safety temperature of 360 , Automatically stops heating once exceed secure temperature **HOT warning** indicates residual hotplate temperature. **LCD display** would show “Hot” when hotplate temperature over 50°C warning point, even if switched off **Electrical Requirements** –As per Indian Standard **Warranty**: 03 years onsite comprehensive warranty onsite full comprehensive free warranty.		

10. VORTEX MIXER

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
1. Speed range of 0-3000 rpm. 2. Movement: Orbital type movement. 3. Heavy metal base with rubber feet. 4. Variable speed control. 5. Choice of continuous operation and touch activated operation. 6. Low speed operation should be possible in touch activated operation. 7. Eppendorf tubes. 8. Low noise operation type 9. 200-240Vac 50Hz power supply 10. **Warranty** 03 years			

11. Hot Plate

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
Hot Plate with: Glass ceramic heating top Ideal for heating samples and concentrated acids Max. heating plate temperature upto 400°C Should include a separate Temperature Control Unit with PTFE or any acid resistant cord connection Heating area approx. 200x200 mm Heating plate dimension approx. 300x300 mm Accessories to be include if any Warranty: 03 years			

12. WATER BATH

Shaking water bath should offer the followings features:

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
1.	Temperature Range	Working temperature range from +5°C to+99.9 °C		
2.	Display	Bright LED-Display with cutting-edge microprocessor technology with PID temperature control		
3.	Capacity	Bath volume ~18-20 liters (one)		
4.	Power	Power switch integrated in keypad		
5.	Temperature Stability / Uniformity @ 37°C	High temperature stability of ±0.5 °C		
6.	Adjustable shaking frequencies	Adjustable shaking frequencies from Minimum 20 to 180 RPM		
7.	Maintenance	Convenient bath drains to easily clean and maintain bath		
8.	Top cover	Lift-up bath cover		
9.	Accessories	1. Stainless Steel Basket for 20 Bottles 0.25 l / 0.5 l - 2 nos 2. Stainless Steel / Polypropylene Test tube rack, for 15-21 tubes of 23-25 mm, 25 -60 tubes of 12-16 diameter(each) 1nos. 3. All electrical peripherals required for smooth functioning e.g. voltage stabilizer should be provided with the equipment. 4. Dust Cover		
10.	Alarms	Audible alarms for Dry-running protection and over temperature		
11.	Timers	Optimize scheduling with auto-on and auto-off timers		
12.	Warranty	03 years warranty against all manufacturing defects.		

13. FLASH POINT APPARATUS

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
• 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. • 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.			

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model

• Inspection: The inspection of the system will be done by our technical expert in the presence of firm representative.
• 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 03 years from the date of installation of the instrument should be covered.			

14. LABORATORY REFRIGERATOR

Laboratory Refrigerators should offer the followings features:

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
1.	Design	1. Vertical with wheels 2. Frost free, CFC free, Automatic Defrost 3. 4 – 5 Height adjustable shelves 4. Internal LED Lighting 5. Single Triple-Pane Glass Door with ergonomic handle Key Lock 6. Automatic door closing 7. Fan forced air circulation to ensure stable & uniform preservation environment.		
2.	Controller	1. Microprocessor Temp. Control Controller with 0.1ºC resolution 2. Controller to Display data about the unit and used to control temperature 3. Control panel should be at eye level with Digital Temperature display & Alarms		
3.	Construction	Electro-galvanized steel with white, oven baked epoxy-polyester, anti-microbial, powder-coated finish.		

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
4.	Capacity	300 - 350 Liters		
5.	Temperature	1. Range: +2□C to +8□C 2. Uniformity: ±3°C		
6.	Alarm	Open door, High/Low temperature, Clogged condenser filter		
7.	Warranty	Comprehensive warranty of 03 years		

15. VERTICAL DEEP FREEZER (-30 °C)

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
Interior: Full stainless steel which can be easily cleaned and eliminates any possibility of contamination **Cooling Type:** Direct cooling **Capacity**: 250 L or higher with a combination of sealed 5-7 pullout drawers / shelves of different sizes e. that can be adjusted for storage flexibility **Temp Range** : - 10 ~ - 30 °C **LED Display** for temperature and temperature history which can be downloaded via a USB port **Refrigerant** : CFC – Free **Easy to read**, LED control panel and alarm status with integrated diagnostics **Acoustic Safety alarms:** Should be equipped with for High/low temperature, door ajar and malfunction alarms **Built in Voltage stabilizer**/battery back-up for 48h or moreCastors for easy movability **Optional Accessories**: RACKS FOR 50 MM BOXES (INCL.DIVIDERS), RACKS FOR 75 MM BOXES (INCL. DIVIDERS) Comprehensive Warranty: 03 Years			

16. VACCUM OVEN WITH DIGITAL PID CONTROLLER AND VACUUM SYSTEM

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
Useful volume : 300 × 300 × 300 mm **Shell Construction**: High quality fabrication of S.S body with double wall arrangement and M.S panel board with neat powder coat painting **Door**: Specially designed SS door and inner door			

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
Insulation: Alumina fiber insulation **Skin Temperature**: Maintained just above ambient **Number of Trays**: Two SS Trays Heating elements: Heater provided around the chamber **Operation**: Single phase / AC Power: 2.5 KV Maximum Temperature: 200ºC Temperature control: PID programmable temperature indicator Accuracy: ±1ºC Indications: Main indicator and Output indicator Control Switches: Mains on, output on and output power selection Vacuum: Min 10-1 Torr Vacuum Indication: Analog Dial Gauge Vacuum pump: Vacuum pump oil free Timer: Special timer for vacuum system			

17. AUTOMATED FAT ANALYZER

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
• Must be capable of quantitative separation of total fats from food. • Must be based on official 'RANDALL' method accepted by AOAC. • The system must have capability to perform un-attended operation and must be programmable. • Sample Positions: ≥ 6 • Measuring Range: 0.1 – 100 % fat • Sample Volume (size): 0.5 to 15 gm • Accuracy: ± 1% • Solvent Recovery: ≥ 90% • Temperature: 100 – 280°C or more • Should be provided with suitable solvent recovery system. • The following safety features must be inherently available in the supplied system • Automatic door lock and sealing during extraction. • Automatic over- temp. control/protection facility. • Equivalent or ATEX classified components for internal exposed valves, IP 65 for other • internal electronics, IP55 for Liquid and Dust protection, Pressurized electronics cabinet. • All material in contact with solvents can be PTFE or suitable high-grade material. • The system should be CE & ISO 9001 certified. • The system should be supplied with at least 12 glass/aluminum extraction cups (preferably ≥ 150 ml.), 24 dozen of suitable cellulose thimbles (preferably 33 Ø x 80 mm) or Filter Bags, at least 6 viton seals, 1 sample tray, 1 boiling stones, 1 cup stand and 1 recovery flask. • The bidder should quote for all required accessories, spares, etc. required for the standalone operation of the system. • Comprehensive Warranty: 03 years from date of satisfactory functioning			

18. AUTOMATED FIBRE ANALYZER

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
• The system must be closed and microprocessor controlled, capable of performing all operations • extraction, rinsing & filtration of samples for analysis of crude fiber, acid detergent fiber, neutral detergent fiber, etc. • Should have agitate/heat Switch & temperature/timer/clock controller for process parameter input and results readout. • System should be based on either crucibles or filter bag technology. • Should have possibility of analyzing 6/12/24 samples at a time • Sample size: ≤ 1 gm. • Measuring range: 0.1 to 100% • Reproducibility: ±1% • In case of fiber bag system 1000 filter bags should be quoted along with the system. • In case of crucible-based system, the following accessories must be essentially quoted for (i) Cold extractor (ii) 24 Crucibles of P2 porosity (iii) Crucible stand for 6/12 crucibles (iv) 2 crucible holders (v) 2 nos. each of acid tank, alkali tank, NDS tank, ADS tank • In case of crucible-based system the following accessories must be essentially quoted for (i) Heat sealer for filter bags; marker acetone resident block. (ii) 12 nos. of glass spacer; drip tray; complete fiber bag incineration module along with 12 nos. of quartz crucible; tubing connection set; automatic alpha amylase dosing unit; and 12 place sample carousels. • The bidder should quote for all required accessories, spares, etc. required for the standalone operation of the system. • The equipment along with all its components and accessories must have 03 years comprehensive warranty.		

19. AUTOMATED KJELDHAL ANALYZER

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
The automated nitrogen analyzer should consist of Distillation unit with built in colorimetric titration; Digester and Scrubber units. The detailed required specification is as under: **A. Digester** • Tube holding capacity: ≥ 20 • Temperature: ambient to 450˚C • Temperature Stability: + 1°C • Digestion Time range: 1 - 999 minutes or more • Should have programmable time & temperature ramping and audible alarms. • Should be provided with automatic motorized lifting of tubes from the heating unit. • Bidder must supply exhaust unit, rack, stand, lid, 40 nos. of digestion tubes ≥ 250 ml. and all other required accessories for standalone operation of the digester. **B. Scrubber system** • The material of construction of the scrubber should be of high endurance materials like borosilicate glass or high-quality stainless steel. • Must have possibility of cleaning as per GLP i.e. having condensation, neutralization, adsorption and redox reactions. • Suction should be regulated/adjustable to achieve efficient digestion. • All supplied reagent containers must be ≥ 2 lts. capacity and must be made of high-quality borosilicate glass. **C. Automatic Distillation and Titration Unit** • Should be completely programmable for all controls like cooling water, dilution water, sodium hydroxide, receiver solution, automatic calculation, automatic emptying of tube, • titration vessel, etc. • Should have built-in colorimetric titration system and allow use of a wide range of • indicators. • Should have possibility for bypassing automatic titration system to allow manual titration. • Should have ≥ 7” color touch screen LED/LCD/VFD display • Nitrogen measurement range: 0.1 - 200 mg or more. • Recovery: ≥ 99.5%. • Should be provided with burette having ≥ 30 ml volume and must have possibility of automatic refilling during analysis. • Minimum dispensing volume: 2 - 3 µl. • Reproducibility: + 1% of RSD.			

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
	• The system should be able to store the recorded data and must have facility for downloading the same using an USB port or through Wi-Fi. • Additionally, it should be possible for transferring weights and retrieving data using suitable software which is compliant to traceability. • The system should have safety sensors and audible warning systems. • Should be provided with exchangeable splash head to reduce carry-over effects. • The system should be provided with suitable password protection to prevent tampering of programmes and data. • The system must be compliant to ISO 17025, GLP, AOAC, ISO, IDF. • The system shall have the possibility to track performance of the system and warns if analysis results changes over time. It is desirable to have component traceability feature in the system for effective maintenance of the system. • The instrument shall be delivered with a Verification Test document that certifies that instrument has been performance tested in factory (confirming analysis performance). • The systems should be supplied with Kjeltabs (5000 nos.), 4 tanks of ≥ 20 lts. along with level sensors for each of them. • Warranty: The equipment along with all its accessories must have 03years comprehensive warranty. • The bidder to quote for any required accessory, spares, etc. required for the standalone operation of the system.		

20. SPECIFICATIONS FOR FLAME PHOTOMETER

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
• 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			

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model

• 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 03 years from the date of installation of the instrument should be covered.			

21. <u>LOVIBOND TINTOMETER</u>

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
• 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 graduatedrange ofLovibond® colour glasses • Viewing system Fully adjustable, prismatic with integral blue filter for lightstandardization • 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 CEInstrument housing Fabricated sheet steel with a tough, textured paint finish			

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
• 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. • IQ, OQ will be done by vendor and will assist during PQ. • For validation vendor should have its own capability with their own company, to perform validation or a third party validation will be entertained. One validation at the time of installation should be done. • Warranty: Comprehensive warranty with spares for 03 years from the date of installation of the instrument should be covered.			

22. <u>COOLING CENTRIFUGE</u>

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model

A Multi-functional, general purpose e High speed refrigerated bench top centrifuge for sedimentation of samples with easy lift and safety lid
Specifications
• Temperature operation range: 4 to 40ºC
• Maximum speed**:** 15000 rpm/20000 RCF or better
• Should have LCD display
• Should have low access height
• CFC free refrigerant
• Should have maintenance free brushless drive motor
• Should have automatic rotor recognition facility
• Automatic imbalance detection
• Should have motorized lid lock system
• Fixed Angle Rotors for:
  • 50 ml Falcon tube
  • 15 ml Falcon tube
  • 1.5-2.0 mL Eppendorf tubes and adaptors for 0.2 and 0.5 mL tubes/ Eppendorf
• Other items (rotors/adapters) required for improving the applicability/system performance should to be quoted as optional.
• Optimum safety according to national and international regulations (IEC 1010)			

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
• Warranty: The equipment along with all its accessories must have 03years comprehensive warranty. • The bidder to quote for any required accessory, spares, etc. required for the standalone operation of the system.			

23. <u>NITROGEN EVAPORATOR</u>

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model

• Holds Test Tubes with Suitable Racks (with up to 30 ml capacity) for handling 1ml to 30ml solvents
• Uses Nitrogen Gas as Evaporator with Efficient Nitrogen Consumption.
• Closed system with exhaust facility and Evaporation process driven bygas vortex shearing Action.
• Temperature controlled Water Bath.
• Temperature
  • Accuracy: +/-1°C
  • Temperature range: Ambient to 99 °C
• Each manifold row will work independently.
• Accommodates 50 sample tubes of different volumes and each 10-position row can work independently
• Gas flow: 140 L/min.
• Pressure Regulator range: 0-30 psi adjustable
• Solvents that can be evaporated include acetone, acetonitrile, dichloromethane, ethyl acetate, methanol etc
• Display: LED/LCD Display
• Keypad: Feather touch operation
• Operating Voltage: 220V,50Hz
• Time range: 1 to 99 min Operation: Simultaneous automated concentration of multiple samples and unattended operation, automatic gas shut off and operational diagnostics.
• Pressure display in Digital with Bar/PSI/KPA unit selection
• The evaporator directs the gas flow into the sample tubes at a precise angle. Facility to record and print test records via computer
• System should be CE certified.
• Real time data and data storage facility via computer or USB
• Following accessories should provided
  • Evaporation tubes- 500 Nos
  • Gas connection tubes – 20 m.
  • Power cable – 1No
  • Fuse -10 Nos
• Warranty: The equipment along with all its accessories must have 03years comprehensive warranty.			

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
• The bidder to quote for any required accessory, spares, etc. required for the standalone operation of the system.			

24. MICROFILTRATION ASSEMBLY

Sl. No.	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
1.	Application	Used for the collection and preparation of samples, mobile phases, and buffers to obtain the highest quality results from downstream analysis		
2.	All-Glass Filter Holder	With borosilicate glass funnel and base, anodized aluminum spring clamp, silicone stopper, coarse-frit glass filter support and PTFE-faced funnel and base for 1. 47 mm disc filters 2. 25 mm filters		
3.	Stainless Steel Vacuum Filter Holders	Analytical Filter Holders For 47 mm disc filter.		
4.	Filtering Flasks	Side arm connects to vacuum source with 3/8in. I.D. hose. 1 L and 4 L flasks accept no. 8 perforated stopper. 125 mL flask accepts no. 5 stopper.		
5.	Filter Forceps	Highly polished stainless steel forceps blades with beveled, un-serrated tips to prevent damaging the membrane filter.		
6.	Oil less vacuum pump	flow rates of up to 37 L/min		
7.	Membrane Filters	Filters 47mm and 25 mm for a) Aqueous solvents b) Hydrophobic solvents		

25. AUTOTITRATORS

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
	• Auto- titrator should be microprocessor controlled • Should be PC compatible • Should have memory storage of 50 programmes • Should able to change the burette/piston quickly • Should have GLP compliant selectable report formats • Should have quick method and reprocessing of results • Should be able to modify to perform as a Karl Fischer Titrator with KF conversion accessories. • Should perform acidimetry, alkalimetry, redox, precipitation, complexometry and non-aqueous titrations. • Should provide all required electrodes for performing the above titration • Key board should be soft touch and alphanumeric • Display should be LCD • Calibration should be automatic and two point calibration for user entered buffer values. • Power input to be 220V/230V 50 Hz ac supply • The unit shall be capable of operating in ambient temperature in the range of 10- 45ºC and relative humidity of 5 to 80% • Should comply to USP and DIN standards • Warranty: The equipment along with all its accessories must have 03years comprehensive warranty. • The bidder to quote for any required accessory, spares, etc. required for the standalone operation of the system.		

26. <u>WATER PURIFICATION SYSTEM</u>

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
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, EDI 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 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 DegC : 0.055 µs/cm or better • Should have resistivity @ 25 DegC : 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 03 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 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		

27. DIGITAL BUTRYO REFRACTOMETER

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
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 Control through Peltier	• Concentration 0;95% • Refractive Index 1.32422—1.7000		
Minimum Indication	Butyro 0.1% RI 0.0001		
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 volume 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 03 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		

28. NITROGEN GENERATOR

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
• Flow rate : 250 ml/min • Purity : Better than 99.999% • Delivery pressure: 80 PSI or above • Method of Purifications : Pressure Swing Adsorption Technology • N2 purity :< 0.05 ppm Total Hydrocarbons • External Air Compressor: suitable air compressor for inlet of feed air with necessary drier & filters & 5 mtr pipeline between air compressor & generator should be included. • Air quality of the external air compressor - ISO8573 - 1:2010 Class 1.4.1(clean dry air to enhance the life of the nitrogen generator. • Sound level Nitrogen generator should have silent operations with max 25 dB and external compressors should be less than < 80db.			

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
• Fittings: 1/4'' Swagelok for outlet N2 and Inlet Air (if compressor is not installed) • Power consumptions (watt): ≤ 500 W • Power requirements: 230 V / 50 Hz – 230V/60Hz • Warranty: The equipment along with all its accessories must have 03 years comprehensive warranty. • Should have company owned service engineers. • The bidder to quote for any required accessory, spares, etc. required for the standalone operation of the system.			

29. <u>UV/VIS SPECTROPHOTOMETER</u>

UV-Visible Spectrophotometer should offer the followings features:

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
1.	Wavelength Range (nm)	190-1100		
2.	Wavelength Accuracy (nm)	0.8 or better		
3.	Light Source	Xenon flash lamp Preferred/Deuterium and Tungsten Halogen lamp		
4.	Detector	Photo Multiplier Tube/Silicon Photo Diode		
5.	Sample holder	Should have reference and sample curette positions.		
6.	Wavelength Repeatability (nm):	0.2 or better		
7.	Spectral Bandwidth (nm)	0.5 to 2.0 or better		
8.	Photometric Mode	Absorbance, Transmittance (%) , intensity		
9.	Detector	Should have reference and sample curette positions.		
10.	Scan/Skew Speed	Min 2500 nm/min or better		
11.	Photometric Accuracy	± 0.005 Abs at 1 Abs		
12.	Interface	USB preferred or LAN		
13.	Accessories	1. Curettes: glass 6 nos. and quartz 4 nos. of variable capacities for liquid samples 2. Optional: Magnetic stirring controller, stirring head and magnetic stirring bar for 10 mm path length curette stirring capability to single cell		

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
		and multi cell holders for low viscosity liquids 3. Dust Cover		
14.	Computer System	High Speed branded computer system with laser jet printer		
15.	Software	Window based complete multitasking software. Compatible software for data acquisition and data analysis in all the spectrophotometric wavelengths and modes 18. Minimum One Years		
16.	Warranty	Comprehensive for 03 years (more on lamp) and option for up gradation to be specified		
17.	Scope of supply	The instrument should supply with Basic instrument, 1 Inch matched Glass sample cell, basic user manual, a multi adapter for round and rectangular vials, CD with manual and procedure manual in .pdf format. Power cords		

30. <u>MICROWAVE DIGESTION SYSTEM</u>

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.

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
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 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 at least 16 or more 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 fluro polymer. 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) 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 (minimum 250°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 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 03 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 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		

31. <u>FT IR WITH ATR & LIQUID CELL</u>

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
• Operation of instrument on 220-240 V / 50/60 Hz • Wave number measurement range of at least 7,800 to 500 cm^{-1} • Wave number accuracy – within ± 0.01 cm^{-1} • Resolution - ≤ 0.5 cm^{-1} • Signal to noise ratio – (≤ 5 cm^{-1}, ≤ 1 min scan) ≥ 30,000 : 1 • Optical system – Single / Double beam • Sealed and desiccated optics • Temperature controlled and moisture / humidity resistant KBr optics • Light– high intensity long life ceramic source • Standard interferometers and detectors • Instrument alignment and performance to be immune to minor mechanical disturbances • Reliable calibration mechanism • Auto subtraction of CO2 and H2O absorptions • Provision for investigation of both solid and liquid samples • Standard sample cell holders for both liquid and solid samples			

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
• Variable temperature Sample cells / Jackets for solid samples – 2 nos • Variable temperature Sample Cells / Jackets (KBr windows) for liquid samples – 5 nos • Variable path length accessories (spacers) for liquid samples – 0.02 mm, 0.05 mm, 0.1 mm, 0.5 mm, 1 mm (2 sets of accessories for each path length) • Single / multiple (horizontal) reflection Attenuated Total Reflectance (ATR) with ZnSe prism – as a demountable integrated unit (minimum range of 7800 – 550 cm^{-1}) • Variable temperature Cell Holder with temperature controller with one NaCl external window and one KBr external window – for studying both solids and liquid samples, Heatable with temperature range: minimum -90 to +150 °C • Heatable cells with KBr windows for liquid samples – 2 nos • Heatable Spacers (2 sets as mentioned above) for variable path length • Heatable cells with KBr windows for solid samples – 2 nos • Suitable high quality vacuum pump (preferably oil free) for variable temperature cell • All essential accessories • Compatible Computer + Monitor + accessories – with latest RAM, suitable software and Windows installed • USB operational • Laser Printer • Compatible software for multiple users • Suitable capacity UPS with 30 min backup • Complete installation and demonstration • Warranty: The equipment along with all its accessories must have 03years comprehensive warranty. • The bidder to quote for any required accessory, spares, etc. required for the standalone operation of the system.		

32. <u>AAS(GTA/FLAME/VGA)</u>

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
• 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			

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model

• Optics: Double Beam dual blazed / holographic Czerny turner Monochromator/EchleyMonochromator and prism or equivalent
  • 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 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.			

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
• 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, 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 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 • Temperature Range: Temperature range ambient to 2600°C or more in 1°C increments Feed back system		

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
• 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 volatileprogrammes • 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, 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			

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
• 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 • 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 • 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, 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.		

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
• 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 (installation report) 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 03 years from the date ofinstallation of the instrument should be covered.			

33. <u>ICP-MS</u>

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
ICP-MS should be compact, fully automated and computer controlled, capable of doing elemental analysis accurately & precisely for Rare Earth Elements (REE) and Platinum Group Elements (PGE) in higher concentration, trace and ultra-trace (ppm, ppb, & ppt) levels and isotope ratios in diverse range of food matrices 1. The system should have a. Computer controlled fully automatic ICP-MS system b. Simultaneous multi-elemental analysis in ppm, ppb and ppt levels with required sensitivity and stability of diverse range of food and water samples c. The system should be a space saving, compact model that can fit into allocated lab space with all the sub- systems and accessories. d. Corrosion-resistant exteriors should be provided e. Model number of the equipment proposed to be supplied to be clearly mentioned **<u>2. Sample Introduction system</u>** The system should have a. Nebulizer: Concentric Micro mist Nebulizer or Cyclonic glass spray chamber with low sample flow rate			

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
b. Spray Chamber: Peltier cooled spray chamber with an operating temp range from -10°C - +20°C to handle wide range of organic solvents c. System should come with Ar gas or liquid or combination of Ar and liquid dilution capability to handle samples containing TDS of ≥25% . d. Peristaltic pump: Low pulsation high precision peristaltic pump with minimum of **03 or more** separate channels which can be controlled through the software. e. The system should have at least two or more dedicated gas channels to use varied collision/ reactions gases like He,O2,NH3,etc for effective removal of interferences in challenging sample matrices **3.0 Plasma** 3.1 RF Generator: a. Computer controlled Radio Frequency Generator (Solid State): operating between 27 or 34 MHz Impedance Matching: Auto-tuning to get maximum coupling efficiency b. **RF range from 600-1600 watts (or more) variable capability for efficient and superior ionization when changed from aqueous samples to organic samples with automatic impedance matching.** 3.2 Torch: Easy mountable single piece quartz torch with shield torch or better technology a. Torch movement should allow for complete computer-control and auto tunable in x-y-z directions with independent movements in the three directions. b. Provision for Auto-alignment of the torch after routine maintenance with a reproducibility better than 0.1 mm in x-y-z directions 3.3 Plasma Gas Control: Controllers (AFMC) or equivalent PC controller for control plasma, auxiliary make up, carrier gases, Gases used should be controlled with mass flow controller or equivalent and fully computer controlled. **4. Ion Extraction Interface** The system should have a. Standard sample and skimmer cones with suitable orifice diameters to suit all application and to prevent clogging and minimize signal drift. It should be easily mountable and dismountable. b. Scope of supply of standard (Nickel) and optional (Platinum) cones should be clearly specified. (for any alternate material, bidder would need to prove sensitivity) c. Lens/ extraction cones or equivalent should be easy to maintain. 5. Ion Focusing System The system should have • Ion focusing system with efficient mechanism for removing all neutrals and photons from the Ion path. • Cell offering three modes of operation: Standard Mode, Collision Cell Mode and Reaction. Should have the flexibility to run all three modes in single run.			

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
• Switching of reaction and collision gases will be through software and automated. Unit will have the flexibility of applying both (collision, and reaction) gases using single method for removal of interferences. Mass Cut off facility or equivalent technology should be there to remove unwanted polyatomic interferences formed due to free atoms. • A reaction cell should be provided for poly atomic interference removal with Helium, Oxygen, Hydrogen & NH3/CH4 mode. • Vendor should attach international published application notes for Arsenic analysis as per FSSR (2011), EU/USFDA where O2 or any other suitable gas is used to remove interference for ArCl which demonstrates mass shift mode. • Reaction cell assembly and octopole/ hexapole/quadrapole assembly (if requires cleaning any time in lifetime) should be quoted. 6. **Three Quadrupole** Assembly The system should have a. Quadrupole Mass Analyzer: A quadrupole mass analyzer to provide effective ion transmission, superior resolution and abundance sensitivity. b. Mass range: 5-260 amu or above c. RF Frequency : Fully Digital RF generator with frequency 2-3 MHz d. Abundance sensitivity: e. Low Mass Side: ≤ 5 x 10-7 f. High Mass side: ≤ 1 x 10-7 or <0.5ppm at m-1(m=133Cs) in the mass range 2-225u. g. Scan Speed: Greater than >3000 amu/s h. Mass stability: < ± 0.05 amu over 8 hours of continuous operation. i. Resolution: Variable from 0.5 u to 1.0 u or better, user definable **7. Ion Detector Assembly** The system should have a. Solid State dual stage dynode discrete over 9 orders of 10 orders or more magnitude of linear dynamic range in a single continuous scan b. Should be unique log amplifier circuit, features a high-speed analog mode for transient signals and a true nine orders dynamic range. c. Minimum dwell time / integration time of 100 µs (in both pulse count and analog modes. d. Dual-stage detector assembly should come as a standard with the system. **8. Vacuum System** The system should have a. Efficient Vacuum system with turbo molecular pump and single external rotary pump for fast pump down and simple maintenance.			

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
b. In the event of vacuum failure, the entire vacuum system is to be automatically back-filled by inert gas to preserve the cleanliness of the system or an alternate system. **9. Performance Specifications** Guaranteed sensitivity specifications will be considered (To be demonstrated during Demo): Typical sensitivity values will not be considered a. Should be able to analyze Sn, Ni, Cu, Zn, Ba, Sb, Ni, B, Ag, Mg, Ca, Na, As, Cd, Cr, Hg, Pb, Se, Fe (but not limited to these elements) at a concentration of 0.05ppb with RSD of <5% at standard conditions. b. Oxide ratio (%) CeO/Ce< 3 % c. Double charged ratio < 3 % • Isotope-ratio Precision: 1%RSD **10. Water Chiller** The system should have a suitable re-circulating chiller changer of internationally reputed company for plasma component cooling. **11. Auto Sampler** The system should have a. Highly effective auto sampler compatible with operation along with ICP- MS without user intervention. b. Auto sampler with minimum 150 -200 vials holding capacity with 500 nos. of 15 ml capacity tubes (as consumable). c. Programmable complete with inert PTFE coated probe with PTFE inner tubing. d. All accessories, racks, bottles, tubing assembly, waste container, dust cover etc. **12. System Controller and Operating System** The system should have a. Software control for automatic data acquisition and processing. b. Mass spectrometer tuning and calibration auto and manual c. Data Validation (IQ/OQ/PQ for Software) d. Self-diagnostics with option to set routine maintenance check alerts to raise alarms when preventive maintenance is due. e. Multi element analysis capability f. Isotope ratio and dilution g. Cool Plasma or other facility to eliminate polyatomic interferences. h. Remote diagnostics i. Software should control plasma, MS and other accessories like auto sampler j. The system software shall support the following calibration curve fit modes for Quantitative analysis: k. Linear least squares. l. Weighted linear least Squares m. Linear forced-through-zero least squares. n. Quantitative analysis including external calibration, additions calibrations, method of standard additions, isotope ratios and isotope dilution's and semi quantitative analysis.		

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
o. On-line help with quick steps to reference entire instrument user manual. **13. Computer** a. Minimum Intel core i5/i7 processor, 2.0 Ghz or more, 19″or more LCD/TFT Monitor, 500 GB HDD, DVD Read/Write, 4 GB RAM,4 USB Port or higher configuration for use with the above system to be provided. b. Reputed Branded colour Laser jet printer and automatic back to back should be provided 14. Multi vessel Microwave digestion system The system should be provided with a suitable microwave digestion system of 20- 25 **(min 16 vessels)** samples processing capacity in one batch. Rotors and tubes for digestion of large samples and smaller samples (mgs) along with proper fume hood system. The specification along with the model should be provided at the time of tendering. 15. Exhaust unit Exhaust unit for the ICP-MS has to be supplied along with the System 16. Standards with minimum expiry of one year a. Specially pure Analytical NIST traceable single element standard solutions(Minimum pack or 100ml each whichever is lower) for Sn, Ni, Cu, Zn, Ba, Sb, Ni, B, Ag, Mg, Ca, Na, As, Cd, Cr, Hg, Pb, Se, Fe should be supplied b. Multi element Calibration NIST traceable standards for ICP-MS - one set 17. Power Supply The system should have UPS (minimum 20 KVA) of suitable rating with voltage regulation, spike protection and minimum 60 minutes back up for the supplied equipment. 18. Accessories (to be quoted independently) The following Items, but not limited to, has to be supplied along with the equipment a. Peristaltic pump tubing-sample intake – 100 No's b. Peristaltic pump tubing-Drain – 100 No's c. Tubing – Auto Sampler to Peristaltic Pump – 25 No's d. Micro mist nebulizer – 5 No's e. Plasma Torch – 5 No's f. Ni Sampling Cone – 4 No's and Pt Sampling Cone – 2 No's f. Ni Skimmer Cone – 4 No's and Pt Skimmer Cone – 2 No's g. Off axis lens – 5 nos(If required by the system) h. Ion lens – 5 Nos(If required by the system) i. Hyper skimmer cones/extraction system for HF digested sample. (If required by the system) j. Vacuum Pump oils – 5 years of operation k. Argon Gas Cylinders-6 l. Gas cylinder for Collision cell gases – Helium-1 m. Gas cylinder for Reaction cell gases -Oxygen, Hydrogen & Ammonia/CH4 (>99.99 % mixed or pure as per system			

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
requirement), whichever is applicable for individual system for elimination of interference species along with n. 3 stage Gas pressure regulators for each cylinder. o. Gas purification panel for Argon, Oxygen, Helium & Hydrogen with appropriate plumbing. p. Optional: Any other accessory as felt required for the proper functioning of the equipment. 19. Additional items a. Consumables for Five years operation of the system for main ICP unit, spare torches, nebulizer, tunings, and moisture trap are required to be quoted. b. Bidders should quote a startup package for 100 samples. In addition, the bidders should give a list of recommended consumables along with their source and budgetary prices. c. Operation kit comprising all required items pump tubings, transfer tubings, work coils etc. for startup/regular operation of instrument. d. Firm should also quote all essential pre-installation requirements and utility requirement for ICP-MS. e. Give the Detection limits (DL) chart for Sn, Ni, Cu, Zn, Ba, Sb, Ni, B, Ag, Mg, Ca, Na, As, Cd, Cr, Hg, Pb, Se, Fe (but not limited to these elements. Provide for as many elements as vendor can) and give the conditions at which the DLs are measured. f. Operation and maintenance manual for each unit in both hard copy and soft copy. g. Service manual with set of required tools for each system/unit. h. The system should have Server connectivity and should be capable of 21 CFR Part 11 and food safety compliance. The necessary validations will have to be carried out by the equipment suppliers. i. Methods library for all food matrixes, related software's and user manuals to be provided. PLEASE PROVIDE MAINTENANCE CHART FOR ALL OF THE COMPONENTS IN ICPMS SYSTEM. 20. Operation and maintenance & Training Component • The supplier will have to carry out successful installation at our laboratory premises and provide on – site comprehensive training for scientific personnel operating the system and support services till customer satisfaction with the system. • One trained personnel should be provided by instrument suppliers for four years who will be responsible for the working of the instrument and assist in standardization of. sample preparation, method validation, operation of instrument and data interpretation. The personnel will not claim to be an employee of the University. The personnel will work under Head of the Department. He will also be responsible for providing training of the instrument to the laboratory staff. 21. IQ/OQ/PQ • IQ/OQ/PQ of the system is required			

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
22. Warranty a. Comprehensive Warranty of 03 years starting from date of satisfactory and faultless functioning of the equipment for 60 days. b. Annual calibration of the equipment shall be a part of the CMC. It shall also be mandatory to perform calibration after every major repair/breakdown. c. The vendor should have available for ten years guaranteed parts and CMC service d. The supplier or his authorized agent should have after sales and service centre near f our laboratory location where the equipment is to be supplied. e. Current user's / performance list with contact details (Customer Contact Name, contact no, mail ID and complete address) and date of installation to be provided for Minimum 5 installations of the model quoted or a comparable model of equivalent sensitivity in the country, preferably in Food sector along with the f. Onsite technical performance evaluation of the quoted model of the equipment will be carried out for those who qualify in the technical bid. 23. Preinstallation requirements • Provide all pre-installation requirements			

34. <u>UPLC WITH PDA, RID AND FLD</u>

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
1	A complete UPHPLC System	A complete UHPLC System with Pump, PDA, FLD and RI detector. All units must be from the same manufacturer. Technical bids with compatible modules from another manufacturer will not be evaluated		
2	Pump	Solvent Delivery - High pressure quaternary solvent delivery system with single pump capable of switching between four solvents. • Flow rate range between 0.05 to 2.000 mL/min or better, in 0.001 mL increments • Flow rate accuracy ±1% of the set flow rate (0.500-2.00 mL/min) • Flow rate precision 0.075% RSD or +/- 0.02 min RSD, 6		

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
		replicates, based on RT (0.500 – 2.000 mL/min or higher precision • Operating Pressure 15,000 psi or better at 1.0 ml/min • Automatic Rinsing Kit • Gradient Mixer & Reservoir Tray with preprogrammed and programmable Gradient curves (including linear, step, concave, and convex (4 • Gradient Composition Accuracy +/- 0.5% absolute (full scale) • It must have a leak sensor as safety feature • Effective System Delay Volume < 400ul, independent of system backpressure (with standard mixer) • Plunger Seal Wash Integral, active, programmable		
3	Vacuum Degassing unit	Online Degassing Unit should have minimum 4 number of flow lines/channels		
4	Auto sampler capacity with sample cooler	• Auto sampler Injection • Injection Volume Range 0.1 – 20 uL, in 0.1 uL increments. • Sample Carryover < 0.005% or < 2.0 nL, whichever is greater (with dual wash). • Injection volume setting minimum should be 0.1 µl & Sample loss during injection is 0% • Sample Delivery Precision < 0.3% RSD, full loop, 3 x overfill, 5-20 uL (default wash/purge conditions, degassed methanol: water 60:40 pre-mix, 1 mL/min, 6 replicates, proplyparaben mix, 254nm) • The injection precision should be less than 1% RSD • Injector Linearity >0.999 coefficient of deviation (from		

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
		2-10 uL, partial loop mode using 20 uL loop w/air gaps) • Number of samples to be processed automatically random access up to 100 numbers for >1.5ml vials.		
5	Columns	• Analytical Columns – 2 • C18 Analytical column (2.1 mm ID x 150 mm length, particle size < 2µm) • Amino (NH2) Analytical column (2.1 mm ID x 150 mm length, particle size <3µm) • Suitable Guard column and holders of 2 numbers required		
6	Column oven	• Column Temperature Control 5 deg. C below ambient to 80 deg. C, 1 deg. C increments. • Column Tracking & Storage Device should be provided • Column Oven to house two or more columns • Safety measures: Solvent sensor, temperature fuse, temperature upper limit cut off. • Temperature accuracy/precision: ±0.5˚C • The Oven Compartment: Should hold two or more analytical columns should have option for the record of column information like number of injections and the composition of the last mobile phase used through column management device.		
7	Photo Diode Array Detector	• Wavelength range: 190 to 800 nm or better • No. of diodes: 512 or higher • Light Source: Deuterium • Wavelength accuracy: ± 1 nm • Drift should be less than 1 x 10^{-3}/10^{-4} AU/hour, at 254 nm		

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
		• Noise level: ± 0.6 x10^{-5} AU or better • Linearity: More than or equal to 2 AU (ASTM method) • Optical resolution: 1.2 nm or better • Long Life Deuterium lamp (> 2000 hrs). • Flow cell volume: 2-5µL or lower • Simultaneous Multi wavelength measurement at minimum four points. • Suitable peak purity software • Auto threshold for peak purity		
8	Fluorescence Detector	• Light source: Xenon lamp Longer Life (> 2000 hrs). • Excitation Wavelength range: 200 nm to 800 nm or better • Emission Wavelength Range: 210-850 nm or better • Dual wavelength simultaneous monitoring possible • Spectral bandwidth: 20 nm • Wavelength accuracy: ± 3 nm or better • Wavelength repeatability: ± 0.25 nm or better • Signal to Noise ratio for Water Raman peak should be > 1000. • Pressure resistance approx 2 to 2.5 MPa • Flow cell volume: 2-15µL		
9	Refractive Index Detector	• RI Range: 1.00 to 1.75. RIU • Measurement range • Noise level should be < 3 x 10-9 RIU • Drift: 2 x 10^{-7} RIU/h • Compatible with flow rates 0f 0.5-2.00 mL/min • Flow cell volume: 9 µL or lower • Leak sensors • Temperature control 30-45 °C or better		

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
		• Automatic purge and automatic solvent recycle valves should be available		
10	Data management system or software	• With software facility for evaluation of data, control and operation of entire system. • System security to be provided by the software and not by the operating system • Software should contain a structurally validated, embedded oracle/SQL relational database • User accounts, user privileges and audit trails are maintained by the software database and not by the operating system • Compliance with cGMP/GLP & 21 CFR part 11 Electronic signature & Electronic Record rules • Software should have its own built in report publisher • Data that has been reviewed and approved may be locked to prevent further manipulations • Software should offer extensive custom calculation capabilities (Concentration, calibration curve, peak soothing, peak subtraction etc.) eliminating the need for external applications to meet the laboratory need.		
11	Computer & printer	• Processor type: Intel Core i7 Processor, 8 GB RAM • Memory size: 1 TB HD, CD-ROM or DVD + RW drive, USB port. • Operating system; Windows 10 Professional (64 bit) or most recent with license. • Monitor type: Wide Screen Monitor (Minimum 21") • Suitable colour laser printer with speed at 35 pages per minute.		

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
		• Software supports for the equipment.		
12	Power requirement	• Power: 120-240 V AC, 50/60 Hz. • A suitable UPS of total rating more than the power consumed by the instrument. Suitable for minimum 60 minutes back up. It must support the whole instrument with computer.		
13	Accessories	1. Sample Vials 100 numbers with 1.5 ml or greater. 2. Ultrasonic bath 3. Stainless Steel Ultra Sonic bath with the capacity of 5 L or more, 4. Time setting (min) 1-30min or continuous operation with LED and Push button (Should be IP 33 Protection class) for sonication of spare parts as well as solvents. 5. Mobile Phase Filter Assembly 6. Mobile phase filter assembly (2 L) for aqueous and organic solvent 7. Aqueous and organic solvent compatible membranes 0.22 microns 100 numbers each 8. Oil free vacuum pump (1 no.) with 4 bar pressures or better should be Neoprene diaphragm based. 9. Fittings, Frits, ferules and Tubing's 10. Tubing cutter (2 no.) 11. Solvent bottles (12 no. each 1000 ml capacity) 12. Solvent filters (Glass & SS both, 08 no. each) 13. Compatible Manual syringes -10µl, 20, (02 no. each) 14. Standards for HPLC Calibration for PDA, RI and Fluorescence detector 15. Spare lamps for each detector		

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
		16. Consumables required for each detector must be provided 17. List of Spares/ consumables required for the smooth functioning of equipment		
14	Installation and Training	Site Training for 5-10 working days on operation and troubleshooting should be part of the installation and commissioning of the system.		
15	Warranty	• The complete instrument and accessories should be under warranty for a period of three years from the date of installation. • Annual calibration of the equipment shall be a part of the Warranty. It shall also be mandatory to perform calibration after every major repair/breakdown. • Onsite performance evaluation of the equipment will be carried out for those who qualify in the technical bid		
16	Compliance Statement	• The supplier must submit technical brochures and proper application notes adequately explaining and confirming the availability of the features in the model of the equipment being quoted. • The supplier must submit a table indicating the compliance of the features of the model of the equipment being quoted with those given in the indent. • Features not matching – must be clearly indicated. • Additional features and features in the quoted equipment which are better than those in the indent – may be clearly explained. • Bids submitted without Technical specifications manuals of each module quoted will not be evaluated for technical compliance.		

Sl. No	Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
		• All pre-installation requirements must be attached		

35. <u>SPECIFICATIONS FOR GC WITH NPD, ECD and FID</u>

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.

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
Oven	• Upto 450 ^{o}C, Fast Oven with 120 ^{o}C/min ramps 8 or more • Cool-down time from 450 ^{o}C to 50 ^{o}C within 3 minutes or better • Should be able to accommodate two or more injectors and two or more detectors • Automatic leak test of system		
Pneumatic Controls	0-100 or better 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 two or more ramps. • Multimode/PTV with 150µL 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 10-50 µL/0.1 to 50 µL • The type and volume of the syringe must be user selectable by the system.		

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
	• Must be able to achieve combined multiple solvent rinsing with upto 4 different solvents. **Head space autosampler** with a capacity ≥30 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 06 vials or better		
Detectors	• The GC must have complete integrated control of all parameters (no external control module) for the following detectors: FID, NPD and ECD. • Detector must be independently controlled and operational for maximum sensitivity		
Flame Ionization Detector	• Linear range : better than 10^7 • Minimum detectable amount with makeup gases : 3 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	• 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/<0.05pg perchloroethylene. • Operating temperature limits : 400^{o}C		
Nitrogen Phosphorus Detector	• Minimum detectable amount: 5.10^{-13} gN/sec and 5.10^{-14} gP/sec • Linear dynamic range: better than 10^4 • Operating temperature limits: 400 °C or better with standard jet		

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
Gas Supplies	• Required High purity Gas cylinders (2 No. Each)		
Columns for Fast GC MS and GC Applications	• Pesticide column (30m x 0.250mm x 0.25µm (HP-5MS / DB-1MS or equivalent) (04 no.) • Column for Fatty Acid Profiling with main concern of Trans Fatty Acid Application (02 No.) • Column for Cholesterol Application (02 No.)		
SOFTWARE AND HARDWARE (Single point control of Software & Hardware)	•		
Library	NIST Traceable Library for pesticides and other compounds (>800 compounds or better).		
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 GC, acquire, store, process and reproduce the data. It must be able to control all the devices from same software. 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.		

Specifications	Requirements	Please Specify whether the quoted model/items meets the specification (Yes/No)	Specify Make and Model
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		

PART IV- SPECIAL CONDITIONS OF RFP

4. **Payment Terms:** The payment will be made as per the following terms on production of the requisite documents:

S.N.	Amount to be paid, INR	Condition(s) for release
Part A		
1	80 % of the cost of equipment	On satisfactory installation and commissioning of the equipments
2	Balance 20% of the cost of equipment	On successful demonstration of the equipments and subsequent training
Part B		
1.	100% of the total cost of civil and electrical works	Running Bill after certification by Civil/Electrical Empaneled Engineer of FSSAI
Part C		
1.	Manpower	The payment in respect of manpower will be released on half yearly basis, after it becomes due.

Sd/-
(Umesh Kumar Jain)
Joint Director(QA)