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Food Safety and Standards Authority of India

(A Statutory Authority established under the Food Safety & Standards Act, 2006)

Quality Assurance Division

FDA Bhavan, Kotla Road, New Delhi-110 002

Dated, the 21st October, 2020

Notice Inviting Public Comments on Draft Specifications for Equipment Used in Chemical Analysis of Food

FSSAI is in process of finalizing the specifications of the equipment required to carry out the Chemical Analysis of Foods under the Food Safety Standards Rules and Regulations, 2011.

2. In this regard, a draft document on "Specifications for Equipment used in Chemical Analysis of Food" is attached for seeking the public comments.

3. Accordingly, the public/stakeholders may furnish their comments/suggestions within a period of 15 days of the publication of this notice on the website to FSSAI through email (labs@fssai.gov.in).

Jyotsana Singh
21.10.2020

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Food Analyst, QA

TECHNICAL SPECIFICATIONS FOR EQUIPMENT USED IN CHEMICAL ANALYSIS OF FOOD

SUMMARY

Food safety is a major concern among consumers and it starts with testing in the laboratory. Food testing is applicable to both safety and quality, and quality control in food manufacture. Central to food testing are 1) instruments which include standard lab equipment like pH meters, analytical balances, spectrophotometers, refractometers, titrators, moisture analyzers and 2) high-end techniques like High Performance Liquid Chromatography, Gas chromatography coupled with Mass spectroscopy. The key driver for the food analyst is to decide on equipment appropriate for the analysis is regulatory compliance. The key specifications of equipment used in a food testing laboratory to meet and comply with the Food Safety and Standards Rules and Regulations (2011) are compiled. The document is divided in to two parts, Part A and Part B. Part A lists all the primary analytical instruments. Part B lists the auxiliary equipment that support the analytical measurements. The list of equipment and specifications and indicative and can be suitably modified in accordance with laboratory's need or for the measuremen

FOOD SAFETY AND STANDARDS AUTHORITY OF INDIA

Inspiring Trust, Assuring Safe & Nutritious Food

Ministry of Health and Family Welfare, Government of India

Table of Contents

LIST OF ABBREVIATIONS

Abbreviation	Expansion
AAS	Atomic Absorption Spectroscopy
AMC	Annual Maintenance Contract
ATEX	ATmosphere EXplosible
AU	Absorbance Units
CCD	charge-coupled device
CI	Chemical Ionisation
CMC	Comprehensive Maintenance Contract
ECD	Electron Capture
EI	Electron Ionization
FLD	Fluorescence Detector
FT-IR	Fourier Transform-Infra Red
FVD	Vacuum Fluorescent Display
GC	Gas Chromatography
GLP	Good Laboratory Practice
HPLC	High Performance Liquid Chromatography
HPTLC	High Performance Thin Layer Chromatography
ICP	Inductively Couple Plasma
IQ	Installation Qualification.
LC	Liquid Chromatography
LCD	Liquid Crystal Display
LED	Light-Emitting Diodes
MRM	Multiple Reaction Monitoring
MS	Mass Spectrometry
NABL	National Accreditation Board of calibrating and Testing Laboratories
NIST	National Institute of Standards and Technology
NPD	Nitrogen Phosphorus Detector
NTU	Nephelometric Turbidity Units
OQ	Operational Qualification
OS	Operating System
PDA	Photo Diode array
PIR	Pre-installation Requirement
PM	Preventive Maintenance
ppb	Parts per billion
ppm	Parts per million
PQ	Performance Qualification
PTFE	Polytetrafluoroethylene
PUF	Polyurethane Foam
RI	Refractive Index
RID	Refractive Index Detector
RIU	Refractive Index Units
rpm	Revolutions per minute
RSD	Relative Standard Deviation
SRM	Single Reaction Monitoring
VOC	Volatile Organic Compounds

PART A: PRIMARY ANALYTICAL EQUIPMENT

1.ANALYTICAL BALANCE

(Capacity Max 200 g) **Application**: An analytical balance is used to measure mass to a high degree of precision and accuracy. It is most often found in a laboratory setting and is used for accurate weighing. Balances should be housed in a draft-free location on a vibration free bench. Some modern balances have built-in calibration masses to maintain accuracy.	
Specification	**Requirement**
Capacity	200 g/ 210 g/ 220 g
Least count	0.0001 g (.01mg)
Readability	0.01 mg (0.00001 gm) / 0.1 mg (0.0001 gm)
Repeatability (Standard deviation)	0.03 mg
Linearity	±0.2 mg or better
Response time	Less than 30 sec
Stabilization (typical and fast)	Approx. 4.0 sec (0.1mg) / 15 sec (0.01mg)
Weighing pan	• a) Circular • b) Single Pan Top • c) Grid type • d) Eccentric load deviation 0.2/0.25 mg
Minimum overall diameter of pan	8-10 cm
Tare facility	Yes
Calibration (internal)	• Fully automatic, time/temperature controlled internal calibration • Should be capable to adjust itself • Must be provided with calibration certificate by an agency accredited by NABL or with traceable to International Standard.
Balance leveling	Balance should indicate immediately as & when it is required to be leveled and Should have the facility for horizontal plane calibration (mercury bubble adjustment), if not otherwise available.
Weight Box traceable to international standards	1. 1 mg - 200 g, E2 (1 no) 2. Accuracy class acc. to OIML R111: E2 3. Nominal mass value: 1 mg to 200 g. 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.
Operational requirements	• Digital display: Backlit display with soft touch screen operation along with accessibility to date and time etc. • To have inner adjustable draft shield • Glass draft shield with flexible configuration for left/right hand operation • Weighing with automatic and manual start and provision for data interface the manufacturer to provide the specification data needed to facilitate calculation of uncertainty Optional: Printer should be available with USB port for data transfer.
Environmental factors	• Safety for electromagnetic compatibility • Permanent shock absorption facility

	• Capacity of operating in temperature range -5 deg C to 45 deg C and relative humidity of 80%
Supplier/ manufacturer	Must be ISO certified for quality
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: - User, technical and maintenance manuals in English language List of procedures required for local calibration and routine maintenance Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories.
Training	The supplier 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
List of Spares and Accessories	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
Back-up rechargeable battery	Back-up battery for use of equipment during power shut down.
Quality Requirement	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 Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its

	authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

2. ANALYTICAL BALANCE (TOP PAN)

Application: An analytical balance is used to measure mass to a high degree of precision and accuracy. It is most often found in a laboratory setting and is used for accurate weighing. Balances should be housed in a draft-free location on a vibration free bench. Some modern balances have built-in calibration masses to maintain accuracy	
Specification	**Requirement**
Design	Top Pan loading
Capacity	0.01gm -1200gm
Weighing pan	a) Circular/ Square Top
Range (weight):	0.01 – 1200 gm
Accuracy:	0.01 gm
Readability:	0.001 gm
Repeatability	0.001 gm
Linearity:	0.002 gm
Response time:	1.5 s
Calibration:	automatic/internal
Display	Touch Screen
Stabilization Time:	2 Seconds (typically).
Tare facility	Yes
Calibration (internal)	Yes Must be provided with calibration certificate by an agency accredited by NABL or with traceable to International Standard
Operational requirements	Capable of operations by multiple users without disturbing settings Digital display: Backlit display with soft touch screen operation along with accessibility to date and time etc. Provision of connection with computer
Environmental factors	Capacity of operating in temperature range 15 deg C to 45 deg C and relative humidity of 80%
Supplier/ manufacturer	Must be ISO certified for quality
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: - User, technical and maintenance manuals in English language List of equipment and procedures required for local calibration and routine maintenance Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)

Training	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
List of Spares and Accessories	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
Battery back-up	Rechargeable internal battery
Quality Requirement	• Should be FDA/CE/BISt 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
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Payment	Payment only after installation, validation and performance demonstration

3.ATOMIC ABSORPTION SPECTROPHOTMETER

Application: Atomic Absorption Spectroscopy (AAS) is used for quantitative and qualitative analysis of various metals in variety of food and water samples at the picogram level. It measures the amount of particular wavelength of light absorbed by the element to promote electrons from one energy level to another, higher, energy level. It typically consists of a 'light source' which emits specific wavelengths of light that are ideally only absorbable by the analyte; an 'atom cell or atomizer' which convert the samples into gaseous atoms; a 'detection system' that serves to isolate and quantify the wavelengths of interest and a computer system to control instrument operation and collect and process data.

Specification	**Requirement**
General	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
Sensitivity	At least 0.9 A for 5µg/ml aqueous copper standard solution with air – acetylene flame
Optics	• Beam dual blazed / holographic Czerny turner Monochromator • Focal length At least 250 mm focal length • Resolution 1800 lines / mm • Width Automatic bandwidth of 0.2 to 1.0 nm
Flame Atomizer	• All titanium or equivalent burner with impact bead / Flow spoiler, premix Design • Movement Automatic movement into the sample compartment • Affect from Acids /Organic solvent Unaffected from attacks by acid solution or organic solvents (e.g. Methyl isobutyl Ketone i.e. MIBK • Flame Alignment in liquid beam Fully automatic, optimized with motorized burner mount for vertical and horizontal burner adjustment
Nebulizer	High precision able to provide manually adjustable uptake rates material of the nebulizer and related Venturi should be inert to acid solutions and organic solvents such as MIBK
Flame and Gas Controls	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 tubing in the system Automatic Lamp Selection Function Computer controlled Hollow Cathode Lamp selection and alignment
Lamp Holder	At least 8 lamp holders with built in power supplies for hollow cathode lamps and electrode – less discharge lamps or equivalent

Operating Parameter setting	Automatic Setting
Read Out /Display	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 / Spare	All accessories 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	better than or at least 1% at ppb levels of mercury, arsenic etc
Absorption Cell	The absorption cell's material should have no effect of the high heat of the flame and the cell for the analysis of mercury should be of a closed cell design
Flame Arrester	Flame arrester should be provided in the tube which connects the assembly to the absorption cell
Cell Design holder	The design of the cell holder should give a firm and easily adjustable (for alignment) mounting on the burner head.
System accessories	Complete with necessary reagent bottles, connectors etc.
Hollow Cathode lamps	16 hollow cathode lamps. One lamp each for the elements: Arsenic, Antimony, Boron, Calcium, Chromium, Cobalt, Copper, Iron, 19 Nickel, Lead, Manganese, Mercury, Selenium, Tin, Vanadium and Zinc. Equivalent coded lamps will also be acceptable.
Air Compressor	With Air Filter or equivalent Air Service Unit Complete with pressure regulator quite in operation, necessary tubing and connectors and should meet the air supply requirements of AAS operation
Oil Free Pump	Oil- free pump and moisture trap Corrosion Resistant to acidic vapour and the drain value (if any) should be made of stainless steel of equivalent corrosion resistant material
Nitrous – oxide gas regulator	Nitrous – oxide gas regulator (two stage) with heater, with necessary tubing 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 (program 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
Feedback system	Feedback system for furnace temperature control, interlocks for water, gas, temperature, furnace door, graphite tube damage and mains power
Temperature Programming	At least eight steps temperature programming facility with flexibility of program selection, ramp time, gases, gas flow and read trigger for 20 each temperature step
Furnace 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 nonvolatile programs
Chiller / 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: • Program 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.
Standards	AAS standard reference materials from NIST for all metals
Computer system:	• Make: Reputed brand such as HP/Compaq/IBM/ Dell • Processor: Intel core 2 duo processor 3.00 GHz or highest version • RAM: 4 GB (upgradable up to 8 GB) HDD 500 GB ultra DMA or higher HDD (7200 RMP) • Monitor: 21” TFT – LCD Flat Colour • CD ROM: 52X CD- ROM • DVD-CDRW: 32X DVD-ROM and CDRW – combo Drive Max speed 48x24x48

	• Ports: 2 serial, 1 parallel and 2 USB front 6 rear USB2 PS/2 Port, 1 VGA integrated Port 1line in/out port • Key Board: 104 keys • Mouse: Optical mouse with pad • Ethernet: 32 bits auto selectable 10/100 MBPS • Graphics: Internet ready with integrated graphics • Sound: Integrated sound card and inbuilt stereo speakers • Printer HP Laser jet Printer 1200 x 1200 dpi 12 PPM black.
Operation software	• Preloaded Windows of most recent version of operating system with License • MS Office Most recent licensed version with media, manual Preloaded Antivirus with latest version along with License
Additional items	• Operation Kit: Manufacturers Standard Operation Kit including all required items, tubing, fittings for startup / regular operation of instrument. • Operation / maintenance: Manual Operation / maintenance Manual for each unit Analytical manual • Analytical manual: including applications for flame, VGA and graphite system Service Manual • Service manual: with one set of required tools for each system / unit • Trouble Shooting Charts, Spare parts Catalogue, Application Notes for trace metal analysis in food and water samples • Dust Cover One for each unit • Consumables: For three years operation for each of the following units: Flame AAS (basic unit, burner system) Vapor generation assembly Graphite Furnace Atomizer Auto sampler
Supplier/ Manufacturer	• Must be ISO certified for quality
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
Training	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
List of Spares and Accessories	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
UPS	Suitable UPS/Stabilizer as required for functioning of the equipment
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
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Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

4. AUTOMATED FIBRE ANALYZER

Application: It is used for analysis crude fiber content of food through acidic or alkaline hydrolysis. It eliminates chemical and hot water handling and requires less bench space.	
Specification	**Requirement**
Features	• 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
Analysis of sample	≥ 6 samples at a time
Sample size	0.5 – 3.0 gm
Measuring range	0.1 to 100%
Reproducibility	± 1 % relative at 5 % - 30 % fibre level
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	1 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
Training	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
Accessories to be supplied	• 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 a. Cold extractor b. 24 Crucibles of P2 porosity c. Crucible stand for 6/12 crucibles d. 2 crucible holders e. 2 nos. each of acid tank, alkali tank, NDS tank, ADS tank • In case of filter bag system, the following accessories must be essentially quoted for a. Heat sealer for filter bags; marker acetone resident block. b. 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. • Should be supplied with Certified Reference Material. Enzymes and all other reagents for 100 analysis.

List of Spares and Accessories	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
UPS	Suitable UPS/Stabilizer as required for functioning of the equipment
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
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Payment	Payment only after installation, validation and performance demonstration

5.AUTOMATED FAT ANALYZER

Application: It is used for analysis of total fat content of food samples. It is based on the Soxhlet extraction principle and all functions as soaking; extraction, leaching, heating, condensation and solvent recovery are automated for safe operation. Several samples can be analyzed at the same time.	
Specification	**Requirement**
Function	The system must be capable of quantitative separation of total fats from food, feed etc.
Sample Positions	≥ 6
Measuring Range	0.1 – 100 % fat
Sample Volume (Size)	0.5 to 15 gm or more
Accuracy	± 1%
Solvent Recovery	≥80%
Temperature	35°C– 280°C or better
Other Features	• Shall be completely microprocessor based, fully automatic boiling, rinsing, drying, recovery, lifting of thimbles to cooling position and shut-down; • Shall be based on official 'RANDALL' method accepted by AOAC; • System must have capability to perform un-attended operation and must be programmable; • Should be provided with suitable solvent recovery system.
Safety Features and alarms	• 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.
Material	All material in contact with solvents should be PTFE or suitable high-grade material
Accessories to be supplied	The system should be supplied with at least 12 glass/aluminium 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
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	1 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
Training	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
List of Spares and Accessories	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
UPS	Suitable UPS/Stabilizer as required for functioning of the equipment
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
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Payment	Payment only after installation, validation and performance demonstration

6.AUTOMATED PROTEIN ANALYSER

Application: Kjeldhal method is used to determine organic nitrogen and protein contents in food samples. Automatic Kjeldhal protein analysers are space saving and have distillation and digestion units combined together.	
Specification	**Requirement**
Digestion and distillation unit	Should be combined unit with all units from the same manufacturer and consist of 1. Digestion unit 2. Distillation unit 3. Scrubber 4. Auto titrator
Digester	1. Tube holding capacity: ≥ 20 1. Temperature: ambient to 450˚C 2. Temperature Stability: + 1°C 3. Digestion Time range: 1 - 999 minutes or more 4. Should have programmable time & temperature ramping and audible alarms. 5. Should be provided with automatic motorized lifting of tubes from the heating unit.
Accessories for digester	1. Exhaust unit, 2. Rack, stand, lid, 3. 40 nos. of digestion tubes ≥ 250 ml. 4. and all other required accessories for standalone operation of the digester
Scrubber system	1. The material of construction of the scrubber should be of high endurance materials like borosilicate glass or high-quality stainless steel. 2. Must have possibility of cleaning as per GLP i.e. having condensation, neutralization, adsorption and redox reactions. 3. Suction should be regulated/adjustable to achieve efficient digestion. 4. All supplied reagent containers must be ≥ 2 L. capacity and must be made of high-quality borosilicate glass
Automated Distillation and Titration Unit	1. 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. 2. Should have built-in colorimetric titration system and allow use of a wide range of indicators 3. Should have possibility for bypassing automatic titration system to allow manual titration 4. Should have ≥ 7” color touch screen LED/LCD/VFD display 5. Nitrogen measurement range: 0.1 - 200 mg or more 6. Recovery: ≥ 99.5%. 7. Should be provided with burette having ≥ 30 ml volume and must have possibility of automatic refilling during analysis 8. Minimum dispensing volume: 2 - 3 µl 9. Reproducibility: ± 1% of RSD 10. 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.

	11. Additionally, it should be possible for transferring weights and retrieving data using suitable software which is compliant to traceability. 12. The system should have safety sensors and audible warning systems 13. Should be provided with exchangeable splash head to reduce carry-over effects 14. The system should be provided with suitable password protection to prevent tampering of programmes and data. 15. The system must be compliant to ISO 17025:2017 16. 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. 17. The instrument shall be delivered with a Verification Test document that certifies that instrument has been performance tested in factory (confirming analysis performance). 18. The systems should be supplied with Kjeltabs (5000 nos.), 4 tanks of ≥ 20 L along with level sensors for each of them
Spares and Accessories	All chemicals and reagents for 200 runs
Reference standard	Certified Ammonium sulfate (100g)
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
List of Spares and Accessories	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
Training	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
UPS	Suitable on - line UPS (5 KVA) to support the instrument.
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies

IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

7.CONDUCTIVITY AND TDS METER

Application: The instrument is used to measure conductivity, total dissolved solids (TDS) and temperature of the solution.	
Specification	**Requirement**
Range	Conductivity: 0 µS/cm - 200 mS/cm; TDS: 0 - 200 g/L or ppt; Temperature: 0 - 100 °C
Resolution	Conductivity: 0.01µs/cm - 200.0 mS/cm TDS: 0.01 mg/L or ppm to 0.1 µg/L or ppt; Temperature: 0.1 °C
Accuracy	Conductivity: ±1% full-scale; TDS: ±1% full-scale; Temperature: ± 0.5 °C
Calibration	Automatic Standard recognition. User standard one point/ multipoint calibration
Ready Indicator	Should inform when readings are stable
Selectable Cell Constant	Yes
Auto-Ranging	Across 5 Conductivity and TDS ranges Up to 5-point push button calibration
Non-Volatile Memory	Shall hold up to 100 data points
Integral Electrode Holder	Yes
USB port	Yes
Display	LED
Additional Requirements	• Conductivity calibration and verification standards that are traceable to certified international standard SRM NIST. • Calibration certificate and inspection
Accessories	• Electrode holder • One spare electrode
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs should be adequately displayed
Warranty	At least for 2 year for electrode extendable up to 3 year on meter
Training	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
List of Spares and Accessories	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
Battery back-up	Suitable rechargeable battery
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

8.DIGITAL BUTYRO REFRACTOMETER

Application: It is an automated small instrument used for measuring refractive index of animal and vegetable fats and oils	
Specification	**Requirement**
Function	Checking purity and adulteration of fats and oils
Features	• Automated Operating system with LCD/LED screen directly without manual alignment can connect PC with RS232 interface; • 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	Concentration 0;95% Refractive Index 1.32422－1.7000
Automatic Temperature Control	Through Peltier
Concentration	0 - 95%
Resolution	• Butyro 0.1% • RI 0.0001
Measurement Accuracy	Butyro ±0.5% (at 40˚C) RI ±0.0003 (at 40˚C)
Precision (Reproducibility)	Butyro ± 0.05 RI ± 0.00005
Measurement Temperature	0˚C to 50˚C or better
Temperature Accuracy	±0.1˚C
Ambient Temperature Sample	10 to 40˚C
Response Time	≤5 sec
Sample Volume	≤2 ml
Accessories	Reference Material Oil (minimum volume 10 mL)
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	Warranted for 2-year, extendable up to 3 years, after satisfactory installation and working excluding consumable parts and accessories.
Service Support	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer
Training	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

List of Spares and Accessories	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.
UPS	UPS/Stabilizer as required for functioning of the equipment
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies • All Calibration certificate from ISO-17025: 2017 certified laboratory
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.

9.FLASH POINT APPARATUS (PENSKY-MARTENS)

Application: Used to measure flash point of oils and fats by using Pensky-Martens Closed Cup method for determining the quality of oils and fats and contamination.	
Specification	**Requirement**
Design Ignition	Must 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
Detection	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
Measuring Range	Flash point Ambient to 350 °C or more
Heating System	Heat rate: 0.5 °C to 12 °C/min. Heating should be microprocessor controlled at the specified rate; the ignitor is activated and dipped at precisely the correct temperature and frequency
Temperature Measurement	Rugged metal and intelligent Pt 100 probe with built-in calibration, min 5 calibration points
Temperature calibration	Resistance check box for temperature calibration with calibration certificate from ISO 17025/NABL accredited laboratory
Sample Stirrer	Automatic stirrer: test method or user-defined from 0 rpm to 250 rpm or more
Barometric Pressure Sensor	• Built-in sensor for automatic correction of flash point for standard barometric pressure vis-à-vis with final result. Pressure units: Pa, kPa, bar, mbar, psi, mm Hg (Torr) etc.
User Interface	Touchscreen, alphanumeric data input, bar code reader, HDMI
Safety device	Safety device for fire protection with alarm
Power Supply	AC 100 V to 240 V, 50/60 Hz
Number of LED indicators available to indicate Power input	1
DC Voltmeter Range	0-30 Volt
DC ammeter Range	0-50 in milli Ampere
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	Warranted for 1-year, extendable up to 3 years, after satisfactory installation and working excluding consumable parts and accessories.

Training	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
List of Spares and Accessories	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
UPS	UPS/Stabilizer as required for functioning of the equipment
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

10.FLAME PHOTOMETER

Application: The flame photometer is used for qualitative and quantitative determination of several cations, especially for metals that are easily excited to higher energy levels at flame temperature. These metals include Na^+, K^+, Ca^{2+}, Ba^{2+}, and Li^{2+}.	
Specification	**Requirement**
Measuring Range	Na+: 0 to 199.9 ppm K+:0 to 199.9 ppm Ca^{2+} :0—99.9 ppm Li 2+: 0 to 9.99 ppm
Sensitivity	Na+= 0.1 ppm K+ = 0.1 ppm
Specificity	less than 0.5% interference when concentrations are equal to test sample concentrations
Gas Control	Adjustable with knobs
Ignition System	Auto Ignition System
Flame Failure	Auto detection
Gas Cut off	Automatic
Reproducibility	Less than 1% coefficient of variation for 20 consecutive samples using 10 ppm Na set as maximum standard
Linearity	Less than 1%
Display	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)
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Calibration Standard	Must supply traceable standard solutions for Na^+, K^+ and Ca^{2+}
Warranty	Warranted for 1-year, extendable up to 3 years, after satisfactory installation and working excluding consumable parts and accessories.
Training	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
List of Spares and Accessories	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
Stabiliser	Suitable Stabilizer as required for functioning of the equipment
Quality Requirement	• 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 All calibration certificates must be from ISO 17025: 2017 certified laboratory
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

11.GAS CHROMATOGRAPH
With FLAME IONISATION DETECTOR (FID) and ELECTRON CAPTURE (ECD) and NITROGEN PHOSPHORUS(NPD) DETECTORS

Application: Gas chromatography (GC) is a key analytical technique in the food and beverage analysis. It enables complex organic substances to be separated in a gaseous phase and identified quickly. Used for pesticide, fatty acid composition, trans fat analysis of foods	
Requirements	**Specifications**
System	Gas chromatograph with capability of operating concurrently with two injectors or better and three detectors. The system should be quoted with all accessories required to make it fully operational and any other item required for stated applications be quoted as optional.
Oven	• Up to 450 ^{o}C, 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	0-140 psi or better, All Electronic Pneumatic Controls with 0.1 psi precision
Injector (2 or more)	• Should be capable of large volume injection Temperature ramped split less, Split and Cold on-column modes ≥450 ^{O}C max. and ≥10 ramps. • Multimode/PTV with 250µL or better Injection Volume capability with complete solvent vaporizer system or Equivalent. • Injector must be able to operate with capillary & wide bore columns • Injector must be provided with Backflush system.
Autosampler (Liquid)	Robust Liquid autosampler capable of injecting ≥100 samples or better with syringe capacity of 0.5-100 µl • The type and volume of the syringe must be automatically detected by the system. • Must allow installation and automation of syringe featuring volumes from 0.5 to 100 µl. • Must be able to achieve combined multiple solvent rinsing with up to 4 different solvents.
Head space autosampler	With a capacity ≥50 vials or better that support 10 & 20ml vial capacity with Pneumatic control • Incubation Oven Temperature Range 50 to 200 °C in 1 °C steps • Syringe Temperature 50 °C to 150 °C in 1 °C steps • Incubation Oven Capacity vials or better
Detectors	• The GC must have complete integrated control of all parameters (no external control module) for the following detectors: FID, and ECD and NPD. • Detector must be independently controlled and operational for maximum sensitivity
Flame Ionization Detector (FID)	• Linear range: better than 10^{7} • Minimum detectable amount with makeup gases: 1.5 pg C/sec • Operating temperature limits: 450^{o}C with standard ceramic/quartz flame jet • Auto flame out detection. • Acquisition rate 50 Hz or more.

Electron Capture Detector ECD	• Linear dynamic range: better than 10^4 • Complete with ^{63}Ni source and low voltage heaters. • Minimum detectable amount: Less than 10 fg of lindane. • Operating temperature limits: 400°C
Nitrogen Phosphorus Detector	• Minimum detectable amount: 5.10^{-13} g N/sec and 5.10^{-14} gP/sec • Linear dynamic range: better than 10^4 • Operating temperature limits: 400 °C or better with standard jet
Gas Supplies	• Required High purity Gas cylinders (2 No. Each) with regulators Nitrogen, Helium & Zero Air
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 MS, acquire, store, process and reproduce the data. It must be able to control all the devices from same software. Software should allow monitoring of one molecular ion and up to four confirmatory ions. Quantification software for batch process must confirm the analytes as per regulatory requirements in food and environmental sample analysis as per the applications specified. All Flow Controller i.e. Carrier flow, Make-up flow, Hydrogen flow, Air flow etc. value should set through Software by PC. Head Space Auto Sampler, Automation and event control from PC through same software. IQ/OQ of the system as well as software must be provided.
	Software update upt o 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.
Application Support	The Application support for stated applications required during method development and validations.
Pre-Installation Requirements (PIR)	Provide PIR of the system as per the format given at Annexure**.**
Other requisites for GC with ECD/FID/NPD	Automatic Change Over Manifold for each gas line Complete Gas Purification Panel with fittings & installation of all gases Renewable In Line Gas Purification System Renewable gas purifier cartridge, Spare Set Gas clean filters/Traps (6 No.)
Septa for injectors	Nonstick, Low bleed, high puncture tolerance and Max. Temp 400 °C (*for each injector*). (400 No.)
Liners	• Suitable Ultra Inert Injector Liner for SS & SSL (20 No.) • Suitable Injector Liner up to 10 µL (6 No.) • Suitable Injector Liner up to 250 µL (6 No.) • Suitable Injector Liner up to 500 µL (6 No.) • Liner O-Rings Max Temp 375 °C (100 No.) • Liners types required as per the application
Ferrules and Nuts	50 No. (for each column end and other interfaces as applicable), 50 No. for GC with ECD, NPD, FID

Columns for GC Applications	• Pesticide column (30m x 0.250mm x 0.25µm (HP-5MS / DB-1MS or equivalent) (02 no.) • Column for Fatty Acid Profiling with main concern of Trans Fatty Acid Application (02 No.) • Column for Cholesterol Application (02 No.)
Vials, caps and tool for autosampler *(Only Compatible sizes should be supplied)*	• 2000 No. each Vial sets (1, 2 mL, Crimp type, Amber and Clear glass) • 200 No. Vials (10,20ml Crimp type with cap & septa) • 1000 No. 300/500 µL Recovery vials • 6000 No. Septa PTFE/Silicone (for 1, 2 mL Vials) • 6000 No. Septa PTFE/Silicone (for 10, 20 mL Headspace Vials) • Ergonomic Crimping Tools for different vial types • Ergonomic Decapping Tools for different vial types • 10 No. each Storage Racks for (for 1, 2 mL Vials) • Head Space vials 10,20 ml capacity (500no. each)
Autosampler Syringe	10 µL (12 No.), 100 and 250 µL (04 No. each); Manual syringe-2µl, 5µl and 500 µl (04 No. each). Headspace syringe (02 no.10µl, 500µl ,02 no. 1ml)
Sample Preparation *(Water & Food)*	QuEChERS Kits for Pesticides and Herbicides in following Matrices: • Water (1000 No.) • Matrices with high fat (1000 No.) • Matrices with high Water content and (1000 No.) • Matrices with high pigmented (1000 No.)
Tools and Kits	Septa Removing tool Tubing Cutter with rotating diamond blade for column Tubing Cutter for stainless steel tubing (1/16- & 1/8-inch tubing) Tubing Cutter for Plastic tubing with spare blade set
Miscellaneous	Consumables required for each detector must be provided
Reference Standards	NIST traceable standards for all Fatty Acids including Trans fatty acids, Cholesterol and Pesticides under FSS Rules and Regulations 2011
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	Warranted for 2-year, extendable up to 3 years, after satisfactory installation and working excluding consumable parts and accessories.
Training	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
List of Spares and Accessories	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
UPS	Suitable on - line UPS (10 KVA) to support the instrument for 60 mins.
Quality Requirement	• 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 • All calibration certificates must be from ISO 17025: 2017 certified laboratory
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

12.GAS CHROMATOGRAPH–TANDEM MASS SPECTROMETER (GC MS/MS)

Application: Gas chromatography–mass spectrometry(GC-MS) is an analytical method that combines the features of gas-chromatography and mass spectrometry to identify and quantify different substances such as pesticides, fatty acids, PAHs and PCBs.	
Requirement	Specification
GC System	A compact high-sensitive GC-MS/MS system suitable for the analysis of Organo-chlorine pesticides, Organo-phosphorous pesticides, Synthetic Pyrethroids, PCBs and VOCs in food products and water at <1 ppb level with user friendly software. The system should have a Triple Quadrupole geometry, capable of carrying out MS and MS/MS experiments.
Column Oven	The system should have All temperature and time functions are controlled by microprocessor-controlled and are shown on the touch- screen display. • Temperature: Operating Range Ambient +4°C to 450°C • Heating rate: from 50 to 450 °C within 5 min. • Cooling down rate: from 450 to 50 °C in less than 5 min. • Temperature programming facility. • Ramps: minimum 15 ramps with 16 plateaus or more • Maximum inlet temperature ramp rate: 120 ^{o}C / minute or better for all voltages • **Should have oven power safety (power off when door is open)**
Column	• Dimensions: 30m x 0.250mm x 0.25µm • HP-5MS/ DB-1MS or equivalent) (02 no.) • DB-5/ HP-5 or equivalent (01 No) • DB 1301 or equivalent (01 No
Inlet	The system should have • Multimode Injector (MMI) along with Programmable Temperature Vaporizer (PTV) • Temperature ramped split / split-less and large volume injection modes. • Electronic pressure/ flow control. • Pressure setting range 0 to 100psi or more
Auto Sampler	The system should have • Internal standard addition • Auto injector / sampler for Liquid injector (minimum 100 vials) and HS with minimum 60 sample vials capacity • Capable of handling large volume injection with syringe size from 0.5 to 250 µl. • Completely programmable from software.
Backflush	The system should have column end or mid column backflush to remove unwanted components/contaminants/high boilers.
MS/MS System	The system should have • Mass range: Quadrupole 10 to 1000 amu or better. • Mass resolution: minimum 0.7 (width at half height). • Mass axis stability: ±0.1 amu over 24 hours or more • Linear Dynamic range: minimum 6th order of magnitude. • Scan rate (electronic): 10000 amu/sec or better

	• Ionization modes**:** EI (Electron ionization) and CI (Chemical ionization) modes Ion source should have heating capacity of 350°C or more. • CI: must be capable to operate with different reagent gasses & electronic flow control for reagent gasses. • Collision cell gas pressure must be electronically/Software controllable. • Collision energy must be variable. **Scan Modes:** i. Should be able to do Scan, SIM, MRM/SRM, Parent ion scan, Product ion Scan, and Neutral loss scan-time segment based. ii. Simultaneous Full Scan-SIM or Full Scan/MRM or SRM whenever required. iii. SRM/MRM Speed: minimum of 800 MRM/sec iv. Minimum MRM dwell time of 0.5 milliseconds or better. • Installation checkout sensitivity must be better than – • Instrument detection limit: 4 fg or less octafluoronaphthalene (OFN) • EI Scan sensitivity: 1 µl of 1 pg/µl Octafluoro naphthalene (OFN) should give S/N greater than 1000:1 in scan mode 1 µl injection from m/z 50 to 300 for m/z 272. • EI MRM Sensitivity: 1 µL of 100 fg/µL Octafluoronaphthalene (OFN) should produce the following minimum signal-to-noise for the transition from m/z 272 to m/z 222: 6,000:1 or better on 30 mt. column. • Turbomolecular pump: Air cooled turbomolecular pumps, Rotary vane fore-line pumps supporting the turbo- molecular vacuum pump • Noise reduction cover for fore line pump. • Software controlled auto-tune or manual-tune to enable quick start-up for quantitative analysis. • Independently heated GC / MS interface. • Extended dynamic range Electron Multiplier or off-axis high-energy detector with configuration to direct the charged ion of interest away from the neutrals with long life and better sensitivity. • The instrument supplier has to demonstrate that the machine is suitable for the analysis of Organo-chlorine pesticides, Organo-phosphorous pesticides, Synthetic Pyrethroids, PCBs and VOCs in Fish, vegetables and water at < 1ppb level.
System Controller And Operating System	• Should have capability to run the mass spectrometer in all the modes specified in Scan mode. • Data acquisition, integration, calibration, quantification and QC calculations must be automated • Manual and Auto tune options should be provided. • Automatic MRM/SRM method Development • Library searching facility with Licensed NIST Library (in CD/ROM Format). • Pesticides and endocrine disruptors, PCB's, VOC's, Fatty Acid Methyl Esters, and artificial flavors. MRM Database for minimum 800 GC molecules

	• 21 CFR part 11 & food safety compliance. **<u>Quantitative analysis- Qualitative analysis Features</u>** • Imports information directly from the acquisition method • Provides a curve-fit assistant to test all fits and statistics on curve quality • Integrates with an automated, parameter-free integrator that uses a novel algorithm, optimized for triple Quadra pole data • For fast method development, this software is used to quickly review the qualitative aspects of the data, such as the optimum precursor to product ion transitions. • Qualitative Analysis program to present large amounts of data for review in one central location. • Extract chromatograms • View and extract peak spectra • Subtract background • Integrate the chromatogram • Find compounds
PC with Printer	• Minimum Intel core i5/i7 processor, 2.0 Ghz or more, 19″or more LCD/TFT Monitor, 500 GB HDD, SSD Read/Write, 4 GB RAM,4 USB Port or higher configuration for use with the above system to be provided. • Reputed Branded automatic back to back colour Laser jet printer should be provided
Gas cylinders and Regulators	• Installation kit must be included. • Required gas cylinders and regulators (with requisite certificate) for Helium and Argon or Equivalent (2 each)., • Required Gas regulators and gas purification systems should be provided, installed and commissioned for all the gases used in the instrument including gas tubing, manifold
Sample Preparation Kits	QuEChERS Kits (1000 nos each) for Pesticides etc in following matrices: Water High fat containing food High Water content food Highly Pigmented foods (e.g. chlorophyll, lycopene, carotene etc)
Calibration Standards* With a minimum expiry period of two years	• Organo Chloro Pesticides mix in hexane/acetonitrile 2x 1 ml (100 µg/mL of each pesticide) • Organo Phosphorous Pesticides in hexane/acetonitrile 2x1 ml (100 µg/mL) • Pyrethroids in hexane/acetonitrile 2x1ml (100 µg/mL) • Herbicides Glyphosate, Glufosinate 2x1ml (100 µg/mL) *Must cover the complete range of pesticides, of FSS Rules and Regulations 2011.
Spares and Accessories to be supplied	Following Accessories and Consumables • Sample injector: ▪ For liquid injection (5 no. each) ▪ For HS syringe (5 no. each) ▪ Air tight syringe (for manual injection) (2 no. each) ▪ Manual syringe for liquid injector (2 no. each) • Auto sampler vials: 500 vials with screw cap. ▪ Vials with cap for 1.5 ml capacity (100 No.).

	▪ Vials with cap for 10- and 20-ml capacity (each 50 No.). • Column Ferrules- injector end and interface end (20 No. each). • Septa for injector (100 No.). • Appropriate nuts to fit capillary columns to the injector and MS interface (10 each). • Inlet liner for Split less, Split (with glass/quartz wool at optimum position) and PTV (with glass/quartz wool at optimum position) (10 No. each) • O-ring for injector liner (20 No.) • Split vent trap (2 No.) • EI Filaments (5 No.) • CI Filaments (5 No.) • Column cutter (2 No.) • Gas tube cutter. • Oil mist trap for pump (2 No.). • Tool kit.
UPS	The system should have UPS (minimum 10 KVA) of suitable rating with voltage regulation, spike protection and minimum 60 minutes back up for the supplied equipment.
Additional Items	• Operation kit comprising all required items for startup/regular operation of instrument. • Firm should also quote all essential pre-installation requirements and utility requirement for GC-MS/MS. • Operation and maintenance manual for each unit in both hard copy and soft copy. • Service manual with set of required tools for each system/unit**.** • The system should have Server connectivity and should be capable of 21 CFR Part 11 and food safety compliance. The necessary validations will have to be carried out by the equipment suppliers. • Methods library for all food matrixes, related software's and user manuals to be provided. • Provide maintenance chart for all of the components in GC-MS/MS system.
Pre-Installation Requirements	• Provide all pre-installation requirements
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	Warranted for 1-year, extendable up to 3 years, after satisfactory installation and working excluding consumable parts and accessories.
Training	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
UPS	Suitable on - line UPS (10 KVA) to support the instrument.
Quality Requirement	• 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 • All calibration certificates must be from ISO 17025: 2017 certified laboratory
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

13 HIGH PERFORMANCE LIQUID CHROMATOGRAPH (HPLC)

With PHOTODIODE ARRAY (PDA), FLUORESCENCE (FLD) AND REFRACTIVE INDEX DETECTOR(RID) **Application:** High-performance liquid chromatography (HPLC) used to separate, identify, and quantify each component in a mixture. In food analysis it is used for analysis of food colors, food additive, vitamins, sugars amino acids, triglycerides etc It is also used to estimate aflatoxin	
A complete HPLC comprising of a 1) Quaternary solvent system 2) Autosampler, 3) Column Oven, 4) Columns C18 & C8 RP Columns and 5) Detectors (PDA, FLD AND RI). The complete system should be controlled by single software. The system should have the capability to operate the column range from 10 µm to sub 2 µm particles *Note: All units must be from the same manufacturer. Technical bids with compatible modules from another manufacturer will not be evaluated*	
1.Quaternary Gradient System with Online Degasser.	
Pressure operating range	6000 psi or better
Flow Rate Range:	Programmable 0.01 to 10 ml/ min in 0.01 ml/min increments
Flow Precision	±0.1% RSD or below
Flow Rate Accuracy	±1%
Delay Volume	< 650 µl
Eluent Degassing	Online membrane Degasser for all channels
Gradient Mixer	1. Quaternary mixing & gradient capability using high speed proportionate valve) 2. Plunger Seal Wash Integral, active, programmable 3. Gradient Profiles which include gradient curves: linear, step, concave, and convex 4. Composition Accuracy +/- 0.5% absolute (full scale) 5. Composition Precision 0.15% RSD or +/- 0.04 min SD, whichever is greater, based on retention time
Solvent Setting Range	4 solvents setting range:0-100% with 0.1% step
Diagnostic Features	Error detection and display, Leak detection & safe leak handling
PDA Detector	
Wavelength range	190-800 nm
Spectral resolution	1.2 nm or better per photodiode with a Total of 512 photodiodes, digital and optical (3D modes)
Simultaneous Multi wavelength measurement at minimum four points.	
Bandwidth	<5nm or better
Linearity range	<5% at 2 AU, 257 nm
Baseline noise	3.0 X 10^{-5} AU at 254 nm or better
Drift	<1.0x 10^{-3} AU/h at 254 nm
Suitable peak purity software, Auto threshold for peak purity	
3D Spectral contrast algorithm account for random system noise in spectral noise in spectral comparisons.	
RI DETECTOR	
Refractive Index Range	1.00 to 1.75 RIU
Noise Level	± 1.5 x 10^{-9} RIU
Drift	1 x 10^{-7} RIU/hr
Cell Volume	Approximately 10 µL
Temperature Control	Temp. controlled Flow cell unit

Temperature Operating Range	5º below ambient to 50ºC.
Temperature Accuracy	±0.5 ºC
Fluorescence Detector	
Excitation Wavelength	Range 200-890 nm
Emission Wavelength	Range 210-900 nm
Spectral bandwidth	15 nm both in the excitation and emission sides
Wavelength accuracy	should be +/- 2 nm
Repeatability	should be ± 0.2nm
Sensitivity	should be S/N > 1000 (Raman Spectrum of H_2O)
Linearity	should be ≤5% at 2AU with either propylparaben or acenaphthene
Data Acquisition range	should be up to 80 HZ Cell volume should be < 2 micro liter
Pressure	limit up to 500 psi
Flow cell	Design Axially Illuminated Light Source Hg/Xe arc lamp
Column Oven	
Temperature range	10 to 80° C
For column length	300 mm
No of Columns accommodated	Minimum 2
Temperature Stability	±0.1 ºC of set temperature
Cooling system	Peltier based or equivalent technology
Autosampler	
Injection Mode	Total vol. Inj / Variable Inj method
Injection Volume Range	0.1-100µl (Standard)
Replicate Injection	per vial 1-50
Sample Capacity	>80 x 2 ml vials or more
Injection Volume Accuracy	±1%
Injection Precision	<0.5% RSD or better
Cross contamination	<0.1% with & without automated needle wash
Carry over	0.005% from previous injection
Injector Linearity	>0.999 coefficient of deviation (from 2-10 uL, partial loop mode using 20 uL loop w/air gaps)
Tray Temperature Operating Range	4 - 50 º C with ±0.5 ºC accuracy
Accessories	
HPLC Columns	C8 = 250 X 4.6 X 5µm C18 = 250 X 4.6 X 5µm Cyano = 150 X 4.6 X 5µm 1 no. Amino = 250 X 4.6 X 5µm 1 no. Phenyl = 250 X 4.6 X 5µm 1 no. Silica = 250 X 4.6 X 5µm 1 no. All columns must be supplied with respective guard column and holder
Accessories to be supplied	• Sample Vials 100 numbers with 1.5 ml or greater. • Stainless Steel Ultra Sonic bath with the capacity of 5 L or more, with 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.

	• Mobile phase filter assembly (2 L) for aqueous and organic solvent: Aqueous and organic solvent compatible membranes 0.22 microns 100 numbers each • Oil free vacuum pump (1 no.) with 4 bar pressures or better should be Neoprene diaphragm based. • Fittings, Frits, ferules and Tubing's • Tubing cutter (2 no.) • Solvent bottles (12 no. each 1000 ml capacity) • Solvent filters (Glass & SS both, 08 no. each) • Compatible Manual syringes -10 µl, 20 µl, 50 µl (02 no. each) • Standards for HPLC Calibration for PDA, RI and Fluorescence detector • Spare lamps for each detector • Consumables required for each detector must be provided
Software and Hardware Complete system and software configuration must be 21 CFR Part 11 compliant. Software: Database version software with multitasking and capable of performing the following functions: Control the system, acquire, store, process and reproduce the data. It must be able to control all the devices from same software.	
PC with Printer	Latest Factory set, branded system with 22-23" Full HD Monitor with licensed OSs, MS office standard version and Antivirus for 3 year with Printer - B/W - duplex - laser - Legal, A4 - 1200 dpi x 1200 dpi - up to 21 ppm – capacity with Network Card and Bluetooth facility
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;
Supplier/ Manufacturer	Must be ISO certified for quality
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, if any.; • Certificate of calibration and inspection
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	Warranted for 1-year, extendable up to 3 years, after satisfactory installation and working excluding consumable parts and accessories.
Training	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
List of Spares and Accessories	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

UPS	Suitable true on - line UPS (10 KVA) to support the instrument back up for 60 mins.
Quality Requirement	• 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 • All calibration certificates must be from ISO 17025: 2017 certified laboratory
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

14.INDUCTIVELY COUPLED PLASMA MASS SPECTROMETER

Application: Inductively coupled plasma mass spectrometry(ICP-MS) is used detect metals and several non-metals in a diverse range of food matrices at higher concentration, trace and ultra-trace (ppm, ppb, & ppt) levels It can detect different isotopes of the same element, which makes it a versatile tool in Isotopic labelling	
Specification	**Requirement**
System	The system should have • Computer controlled fully automatic ICP-MS system • Simultaneous multi-elemental analysis in ppm, ppb and ppt levels with required sensitivity and stability of diverse range of food and water samples • The system should be a space saving, compact model that can fit into allocated lab space with all the sub- systems and accessories. • Corrosion-resistant exteriors should be provided • Model number of the equipment proposed to be supplied to be clearly mentioned
Sample Introduction system	The system should have a. Nebulizer: Concentric Micro mist Nebulizer or Cyclonic glass spray chamber with low sample flow rate b. Spray Chamber: Peltier cooled spray chamber with an operating temp range from -6°C - +80°C to handle wide range of organic solvents c. System should come with Ar gas dilution capability to handle samples containing TDS of ≥25. d. Peristaltic pump: Low pulsation high precision peristaltic pump with minimum of Four separate channels which can be controlled through the software. e. The system should have at least three dedicated gas channels to use varied collision/ reactions gases like He, O2, NH3, etc for effective removal of interferences in challenging sample matrices •
Plasma	1.RF Generator**:** a. Computer controlled Radio Frequency Generator (Solid State): operating between 27 or 40 MHz Impedance Matching: Auto-tuning to get maximum coupling efficiency • b. RF range from 500-1600 watts (or more) variable capability for efficient and superior ionization when changed from aqueous samples to organic samples with automatic impedance matching. RF Generator: 2.Torch: Easy mountable single piece quartz torch with shield torch 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 Plasma Gas Control**:**

	• Should have at least 3 Mass Flow Controllers (AMFC) or equivalent PC Controller for control plasma, auxiliary makeup, carrier gases. Gases used should be controlled with mass flow controller and fully computer controlled. • Argon gas dilutor or equivalent technology must be quoted along with the main instrument.
Ion Extraction Interface	The system should have 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
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. • 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 & NH_3 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 Ar analysis which demonstrates mass shift mode. • Reaction cell assembly and octupole/hexapole assembly (if requires cleaning any time in lifetime) should be quoted
Tripe 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: I. Low Mass Side: ≤ 5 x 10-7 II. High Mass side: ≤ 1 x 10-7 g. Scan Speed: Greater than >3500 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
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. e. Detector data acquisition rate of 100000 counts /sec.
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. 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
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< 2 % c. Double charged ratio < 3 % d. Isotope-ratio Precision: 1% RSD
Water Chiller	The system should have a suitable re-circulating chiller changer of internationally reputed company for plasma component cooling.
Auto Sampler / Diluter	The system should have • Highly effective auto sampler/ diluter compatible with operation along with ICP- MS without user intervention. • Auto sampler with minimum 200 vials holding capacity with 500 nos. of 15 ml capacity tubes (as consumable). • Programmable complete with inert PTFE coated probe with PTFE inner tubing. • Spare extension tube complete with 20 ml syringe for programmed auto dilution • All accessories, racks, bottles, tubing assembly, waste container, dust cover etc.
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: i.Linear least squares. ii.Weighted linear least Squares iii.Linear forced-through-zero least squares. iv.Quantitative analysis including external calibration, additions calibrations, method of standard additions, isotope ratios and isotope dilution's and semi quantitative analysis. k. On-line help with quick steps to reference entire instrument user manual. l. The software should have data handling and data management, Data security and access control with 21 CFR part 11 environment supports, compliance management and customizable reporting etc.
PC with Printer	• Latest processor (Minimum Intel core i5/i7 processor) , 2.0 Ghz or more, 19″or more LCD/TFT Monitor, 500 GB HDD, SSD Read/Write, 4 GB RAM,4 USB Port or higher configuration for use with the above system to be provided. • Reputed Branded automatic back to back colour Laser jet printer should be provided
Exhaust unit	Exhaust unit for the ICP-MS has to be supplied along with the System
Standards with minimum expiry of two years	• Pure Analytical NIST traceable single element standard solutions (Minimum pack or100 ml 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 • Multi element Calibration NIST traceable standards for ICP-MS - one set
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.
Startup package and Library	A startup package for 100 samples Operation kit comprising all required items pump tubing, transfer tubing, work coils etc. for startup/regular operation of instrument 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 measure. Methods library for all food matrixes, related software's and user manuals to be provided.

	All Calibration certificates for ISO 17025 (NABL) accredited laboratory
Operating manuals, service manuals, other manuals	Should provide: • User, technical and maintenance manuals in English language Maintenance chart for all of the components in ICPMS system • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided • Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
Training	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
Spares and Accessories	The following Items, but not limited to, has to be supplied along with the equipment • Peristaltic pump tubing-sample intake – 100 No's • Peristaltic pump tubing-Drain – 100 No's • Tubing – Auto Sampler to Peristaltic Pump – 25 No's • Micro mist nebulizer – 5 No's • Plasma Torch – 5 No's • Ni Sampling Cone – 4 No's and Pt Sampling Cone – 2 No's • Ni Skimmer Cone – 4 No's and Pt Skimmer Cone – 2 No's • Hyper skimmer cones/extraction system for HF digested sample. • Vacuum Pump oils – 5 L • Argon Gas Cylinders-6 • Gas cylinder for Collision cell gases – Helium-1 • Gas cylinder for Reaction cell gases -Oxygen, Hydrogen & Ammonia (>99.99 % mixed or pure as per system requirement), whichever is applicable for individual system for elimination of interference species along with 3 stage Gas pressure regulators for each cylinder. • Gas purification panel for Argon, Oxygen, Helium & Hydrogen with appropriate plumbing. Optional: Any other accessory as felt required for the proper functioning of the equipment.
UPS	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..
Quality Requirement	• 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

	• All calibration certificates must be from ISO 17025: 2017 certified laboratory
IQ/PQ/OQ	• On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

15.LIQUID CHROMATOGRAPHY–TANDEM MASS SPECTROMETER (LC-MS/MS)

Application: Liquid chromatography–mass spectrometry (LC–MS) HPLC separations with detection using a mass spectrometer. LC-MS/MS qualitative and quantitative estimation of food contaminants (Pesticides, Mycotoxins, antibiotics etc) residues analysis metabolomics etc.	
Specification	**Requirement**
A complete system of a liquid chromatograph and triple quadrupole mass spectrometer	
Triple Quadrupole Mass Spectrometer	
Mass Stability	0.1 Da over 24 hours (please provide graphical data)
Dynamic range	Should be 5 orders of magnitude or better
Mass analyzer	Quadrupole Analyzer: • The instrument should be configured with a quadrupole mass filter for the efficient transmission of ions in MS mode and selection of precursor ions for MS-MS analysis • The Quadrupole mass range 20 – 1200 m/z or better • The Analyzer should have more than one aspect for the efficient ion separation and must be automatically adjusted to desired resolution; (0.50 Da, 0.75 Da or 1.00 Da FWHM)..
Sensitivity	Lower detection and highest sensitivity • ESI positive Ion Sensitivity: The signal/noise ratio for 1pg of reserpine should be >180,000:1 without smoothing to meet the LOQ of 1/10th MRL or better, in MRM mode of reserpine at the transition m/z 609 – m/z 195 (Proof document/application note to be enclosed along with technical tender document). • ESI negative Ion Sensitivity: The signal/noise ratio for 1pg of chloramphenicol should be >30000:1 or better, in MRM mode of chloramphenicol at the transition m/z 321 – m/z 152(Proof document/application note to be enclosed along with technical tender document).
Scan speed	• Should have the scan speed of 15,000-20,000 amu /sec or better for both the quadrupoles
Collision Cell	Specially designed collision cell to allow use of very low DWELL Times (1 milliseconds) without sacrificing sensitivity and Eliminate Cross-Talk to enable Multiple MRM Transition Studies within a single run. MS and MS/MS along with matrix monitoring to be performed in single run.
MRM Acquisition rate	500 MRM data points per second to analyze 400-500 pesticides in single run
Ionization	• Electrospray with Concentric Gas Flow for Nebulisation to cover flow rates from 2ul/min. to 200 ul/min • ESI / APCI combined source: A combined ESI/APCI source must be provided as standard with the instrument. ESI and APCI ionization must be achieved using a single probe. It should able to perform both ESI and APCI in a single run with 15 to 20 ms switching capability
Source Interface	Dual Orthogonal off-axis spray (Electrospray) or any other equally efficient technology capable of avoiding interference from solvents and other extraneous matter.

	Interface should maintain cleanliness of ion optics and capable of handling large batches of complex samples. Capable of handling large batches of complex sample matrix like Animal feeds, Fish and fishery products, poultry and poultry products, Honey, Milk and Milk products, Agriculture products (Fruits & Vegetables) etc. over a long period of time without performance degradation Cleaning of source should be done without venting the system and facility to vacuum interlock. Interface capable of ambient temperature operation and without complex apertures to maintain structural integrity of thermally labile and fragile molecules
Integrated Fluidic Device (to minimize space and tubing)	An infusion device must be integral to the instrument or equivalent and must be controllable from the instrument software. At least 2 user-changeable sample vials should be built into the system to allow tuning and calibration solutions to be infused into the probe via the switching valve.
Polarity switching time	+ve / -ve polarity switching time between alternate MRM scans should be 50 msec or better with supporting documents
Vacuum System	Robust high efficiency vacuum system with minimum maintenance and utility with low noise level. Vacuum read backs must be digitally monitored and controlled through software to ensure fail-safe operation in the event of power failure. All accessories required for the proper functioning of the vacuum system should be supplied. Fore line pump: Oil free Scroll type pump with arrangements of AUTO- ON after Power auto age. High vacuum pump must be Turbomolecular pump: 250 L/Sec or better
Gas Control	All gases must be controlled by the software.
Operating modes	Mass spectrometer should have the following scan options: Full scan Selected Ion monitoring/ recording (SIM/SIR) Product ion scan Precursor ion scan Neutral loss scan Multiple Reaction Monitoring (MRM) MS and MS/MS in a single injection with matrix background monitoring or equivalent. (Proof document /application note to be enclosed along with technical tender document with onsite verification) Simultaneous full scan and MRM or better (Optional)
Detector	A high sensitivity, high throughput detector with zero dead time, low noise and high accuracy at low level detections. An off-axis Dynolite photomultiplier/Electron Multiplier detector Detector must operate in both positive and negative ion modes. Capable of switching polarity rapidly. Should have a better long life. (Life time shall be furnished and the better one will be given preference during technical evaluation).
Nitrogen Generator	Should be supplied with the system along with the trouble-free inbuilt compressor and appropriate capacity reservoir which

	should be sufficient enough to deliver the gases (purity > 99.999%) required to run the system Should be complete with all necessary accessories with Two Years comprehensive warranty with at least one Preventive maintenance along with PM kit each year .
Vacuum Manifold with compatible SPE Cartridges	Minimum 10 cartridges extraction at one time Minimum 1000 cartridges for different analytes i.e pesticide residues, antibiotic residues etc
Liquid Chromatograph The complete system and the MS should be controlled by the single software	
Liquid Chromatography System	Quaternary solvent System with Autosampler, Column Oven, C18 & C8 RP Columns. The complete system and MS should be controlled by single software. The system should have the capability to operate the column range from sub 2um particles. •Pump: Quaternary Pumps/Solvent Manager, low pressure mixing Capable of switching between four solvents Vacuum degassing capability four/more-channel Operating Flow Rate Range to be 0.010 to 2.000 mL/min, in 0.001 mL increments. Effective System Delay Volume < 400ul, independent of system backpressure (with standard mixer) Plunger Seal Wash Integral, active, programmable Gradient Profiles which include gradient curves: linear, step, concave, and convex Maximum Operating Pressure 15,000 at up to 1 mL/min Composition Accuracy +/- 0.5% absolute (full scale) Composition Precision 0.15% RSD or +/- 0.04 min SD, whichever is greater, based on retention time Flow Precision 0.075% RSD or +/- 0.02 min RSD, 6 replicates, based on RT (0.500 – 2.000 mL/min), Flow Accuracy +/- 1.0% (0.500-2.00 mL/min) •Auto sampler Number of Sample Plates two (2) plates: 96 and 384 well plates; vial plate 2-mL vials, (48); tube plates 0.65 mL micro-centrifuge tube, (48) or 1.5 mL micro-centrifuge tube (24). Injection Volume Range 0.5 – 50 uL, in 0.1 uL increments, partial or full loop mode, 20 uL loop standards ;2,5,10 and 50 uL Loops. Sample Delivery Precision < 0.3% RSD, full loop, 3xoverfill, 5-50 uL (default wash/purge conditions, degassed methanol: water 60:40 pre-mix, 1 mL/min, 6 replicates, proply paraben mix, 254nm) Injector Linearity >0.999 coefficient of deviation (from 2-10 uL, partial loop mode using 20 uL loop w/air gaps) Sample Carryover < 0.005% or < 2.0 nL, whichever is greater (with dual wash). Column Temperature Control 5 deg. C above ambient to 65 deg. C, 0.1 deg. C increments. Total system (including pump & Autosampler) should be capable of operation at 15000 psi. Column Tracking & Storage Device should be provided Column Oven to house two, or more columns

List of columns with Specification	C-18, 2.1×100 mm× 1.7 µm with suitable Guard column C-18, 2.1×150 mm× 1.7 µm with suitable Guard column C-18, 4.6 ×250 mm× 5 µm with suitable Guard column C-8, 4.6 ×250 mm× 5 µm with suitable Guard column Phenyl-Hexyl 2.1mm ×100 x, 3µm or equivalent HILIC column with Guard column
System Controller and Operating system: The complete system and the MS should be controlled by the single software	
System controller	• Software must be Multitasking type. It must acquire and process the data simultaneously • Application manager must be compatible with data of full scan, SIM/SIR or MRM. • Data Acquisition, Peak Integration, Calibration, Quantification and QC calculations must be fully automated. • The Quantification method editor must be viewable in page view or spreadsheet. • Application manager must allow to monitor the molecular ion and up to 04 (four) Confirmatory ions or better. • Must be capable of performing the following functions and should be upgradable: • Workstation must be able to control the MS, acquire, store, process and reproduce the data by the same computer. • Workstation must be able to control LC, Detector and auto sampler. • It must be able to regulate the gas pressure and flow during the data acquisition and append to the relevant data file. • Software must have automated calibration and Quantitative optimization. • Automated MS to MS/MS switching during a single run with user selectable criteria • Perform alternating positive/negative scans in one run. Automated Quantitation and reporting of acquired samples. • Data may be processed as it is being acquired • This application software must flag samples in the browser report when: a. the ion ratios fall out-with the user-defined values b. the maximum blank acceptance level (user input) has been exceeded c. the maximum concentration limit (user input) has been exceeded d. the concentration is below the reporting concentration limit (user input) e. the concentration falls below the minimum recovery % level (user input) f. the concentration falls above the maximum recovery % level (user input) g. the coefficient of determination for a calibration curve falls below a user-set level h. QC samples fall outside a user-defined number of standard deviations from the mean i. the peak of the compound of interest falls below a user defined S/N ratio

	Software should have the database of around 1000 compounds (pesticides, Antibiotic residues and Mycotoxins). The Database should contain Molecular formula, Mono isotopic mass, Parent ion, Cone voltage(V), Product ion 1, Collision energy(eV), Product ion 2, Retention time and sensitivity
Calibration Standards	• Two sets each NIST or other traceable standards for all the Pesticides, Mycotoxins, antibiotics as per FSSAI requirement with a minimum expiry period of two years
Spares and accessories	a. LC-MS/MS startup kit should be supplied as standard. b. All required traceable standards for Mass calibration and tuning, HPLC calibration should be provided c. 5µl, 10µl, 20µl, 50µl, 100µl loops, Vacuum pump oil, etc. and any other material required to make the instrument functional should be provided. d. Standard Tool kit should be provided for Instrument maintenance e. Reputed highly branded solvent filtration unit with oil less vacuum pump and required accessories .
PC with Printer	• Most recent or Minimum Intel core i5/i7 processor, 2.0 Ghz or more, 19″or more LCD/TFT Monitor, 500 GB HDD, SSD Read/Write, 4 GB RAM,4 USB Port or higher configuration for use with the above system to be provided. • Reputed Branded automatic back to back colour Laser jet printer should be provided
List of spares	• Provide a list of recommended spares and consumables along with their source and budgetary prices. • Operation kit comprising all required items for startup/regular operation of instrument. • The system should have Server connectivity and should be capable of 21 CFR Part 11 and food safety compliance. The necessary validations will have to be carried out by the equipment suppliers. • Complete methods library with MRMs of Mycotoxins, Veterinary drugs, Pesticides, antibiotics with instrument method details and SOPs, related software's and user manuals to be provided. • Maintenance chart for all of the components in LC-MS/MS system.
Preinstallation Requirements	• Provide all essential pre installation requirements and utility requirement for LC-MS/MS
Operating manuals, service manuals, other manuals	• Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided • Operation and maintenance manual for each unit in both hard copy and soft copy. • Service manual with set of required tools for each system/unit

	• Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	Warranted for 2-year, extendable up to 3 years, after satisfactory installation and working excluding consumable parts and accessories.
Training	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
UPA	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.
Quality Requirement	• 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 • All calibration certificates must be from ISO 17025: 2017 certified laboratory
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

16.LOVIBOND TINTOMETER

Application: It is a visual and automated colour measuring instruments synonymous with accuracy in the measurement of color in edible oils, beverages & foodstuffs	
Specification	Requirements
Measuring principle	Visual, in terms of Lovibond® units
Modes	Transmittance, reflectance Range 0.1 - 79.9 Red, Yellow; 0.1 - 49.9 Blue; 0.1 - 3.9 Neutral
Resolution	0.1 Lovibond® unit
Optical system	11 glass-filled nylon racks containing a graduated range of Lovibond® color glasses
Viewing system	• Fully adjustable, prismatic with integral blue filter for light standardization
Light source	2 x 12 Volt, 10-Watt tungsten halogen lamp Illuminant approximates to daylight
Path length	Up to 153 mm (6”)
Power pack	12 Volt AC, switchable to suit 220/110 Volt supply Approvals CE Instrument housing Fabricated sheet steel with a tough, textured paint finish
Accessories	Conformance filters and certified colour reference solutions representing a range of Lovibond® colours, for quick and simple quality control checks on instruments and operators.
Operating manuals, service manuals, other manuals	Should provide: • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	1 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
Training	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
List of Spares and Accessories	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
UPS	UPS/Stabilizer as required for functioning of the equipment
Validation	For validation vendor should having own capability with tr own company trained service engineer to perform validation No third part validation will be entertained. One validation at the time of installation should be done by company personnel
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

17 pH METER

Application For food analysis, pH adjustment of buffers, solvents etc. with a comprehensive range of features and functions, making it suitable for general laboratory, QC and GLP based applications	
Specifications	**Requirement**
Unit	Consisting of Tri-combination pH/ATC electrode with an electrode holder/arm with smooth movement and protection cover
Working pH Range	0 – 14 pH
pH resolution	± 0.01 pH
Mv	• Range 0 - ± 1999 • Accuracy± 1mV • Resolution 1 mV
Temperature Compensation	0 to 100 ° C with ATC
Temperature	Range -10 to +105°C Resolution 0.1°C Accuracy ±0.5°C ATC range 0 to 100°
Calibration Points	• Should have 3 stage calibration with auto buffer recognition • NIST traceable buffer set 500 ml each (pH 4.0, 7.0 & 9.0).
Alarm	• Calibration reminder interval (1 to 999hrs)
Temperature Compensation	• Automatic
Display	• Backlit blue LCD with operation icon • digital display with 0.001 pH unit readability
Accessories	• Extra Electrode • NIST Standard buffer solution (pH 4.0, 7.0, 10.01 x 500ml for each bottle) • Standard electrode holder • AC /DC Adaptor.
Power	• 9V DC
Data storage& Output	• Data storage facility and record maximum and minimum value. • RS.232C output and supply Data connector cable.
Documents Certificates Performance and safety standards (specific to the device type); Local and/or international	• Manufacturer and Supplier should have ISO 13485 certification. • 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 • Complete with IQ, OQ, PQ, Documents, Operations and Maintenance manuals
Supplier/ Manufacturer	• Must be ISO certified for quality
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 • Certificate of calibration and inspection
Operation and maintenance training	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.
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

18. SOXHLET FAT EXTRACTION SYSTEM

Application: Total fat determination in foods, with full automation for unattended operation and minimum system handling to limit operator's exposure to solvent.	
Specification	**Requirement**
System	A Fully automatic programmable fat extractor for unattended operation with • Extraction of 24 samples simultaneously at different temperatures • Automated solvent addition and solvent emptying • Closed solvent addition • Individual monitoring and temperature control of all 24 places • Operating Temperature up to 300 °C • Programmed process steps and save up to 20 different extraction methods that can be retrieved. • Compatible with all common solvents used for solvent extraction of fats • Circulating cooling water bath with control • Automatic shutdown • Solvent recovery should be more than 70% • Extraction cups/ beakers (100 ml and 150 ml), • Cup holder, • Thimble support, • Thimble holder 2 Nos • Thimbles 50 No • Thimble adaptors 15No • Thimble handler • Tong for extraction cups/beakers: 2 pairs • Thimble stand (2 sets of 6),
Safety device	• Safety device for automatic shut off when temperature exceeds set temperature
Grinder	• Suitable grinder for high fat, high fiber food
Computer	• Minimum Intel core i5/i7 processor, 2.0 Ghz or more, 19″or more LCD/TFT Monitor, 500 GB HDD, DVD Read/Write, 4 GB RAM,4 USB Port or higher configuration for use with the above system to be provided. • Reputed Branded automatic back to back Laser jet printer should be provided
Application Software	Compatible Software should be user friendly & simple for data handling with feature like easy to use, online help and answer wizard, GLP & audit trail and fully compatible with Windows. System built in features such as real time display of temperature; time remaining solvent etc. The software should be 21CFR part 11 compliant.
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. • 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
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, if any.; Certificate of calibration and inspection
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	1 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
Training	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
List of Spares and Accessories	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 System and accessories needed for acid hydrolysis of food Reference substance 50 g with Certificate For the measurement of crude fat.
UPS	UPS/Stabilizer as required for functioning of the equipment
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the

	comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

19. TURBIDITY METER

Application: Turbidity meter is used for the detection of turbidity of liquids and aqueous solutions	
Specification	**Requirement**
Type	Bench Top
Range	0-1000 NTU
Principle of Operation	Nephelometric
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
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
Light Source	Tungsten halogen Lamp/ Infra-Red Emitting diode
Detector	Photo Diode
Connectivity	RS232 interface
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
Training	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
List of Spares and Accessories	Instrument should have all the standard accessories like silicone oil, oiling cloth, filter assembly, sample cells with caps, turbidity standardization kit, Calibration kit, NIST traceable standard solutions And dust cover at the time of supply
UPS	UPS/Stabilizer as required for functioning of the equipment
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

20. UV-VSIBLE SPECTROPHOTOMETER

Application UV-Vis The system should be capable to measure the all colorimetric based parameters in food and water samples as per FSSAI requirements including Enzyme assays, Kinetic assays and scans	
Specifications	**Requirement**
System	A fully automated spectrophotometer with double beam optics with pre-programmed applications using conventional quartz / glass/plastic cuvettes with all the required accessories.
Operation keys	1. Instrument should operate immediately after switch on with no warming up time 2. Should be automatically programmed with on-board touch screen & soft keys 3. Capable to store method with analysis:> 100 method programs on the instrument, > 1000 results with data, evaluation results and used parameters
Optical Design	• Double Beam with sample and reference cuvette positions; Czerny-Turner Monochromatic/Holographic grating with sealed optics • Reference Compartment Should accommodate cells up to 10 mm path length as standard feature
Light Source	(1) Halogen lamp for Visible range (2) Deuterium Lamp for UV range, light source should be auto automatically selected as per wavelength required.
Detector	Silicon Photodiode dual detector/PMT
Scan Ordinate Modes	Absorbance, % Transmittance, % Reflectance
Resolution	0.1nm or better.
Wavelength Range	180 –1100 nm
Wavelength Accuracy	± 0.3nm or better for entire range
Wavelength Repeatability	± 0.1nm or better
Scanning Speed	Selectable Variable wavelength scan rate 10nm/min to 2500 nm/min or
Spectral Bandwidth	Variable (0.1/0.2/0.5/1/2/5) nm
Photometric Range	Absorbance = -4.5 to 4.5 Abs or better. Transmittance & reflectance 0 to 80000 % or better.
Photometric Accuracy	0.5 A: ± 0.004A; 1A: ± 0.006A; 2A: ± 0.010A; (440 nm; traceable neutral density filters)
Stray Light	Max. 0.005% (220 nm NaI) or better, Max. 0.005% (340,370 nm NaNO2) or better Max. 1% (198 nm KCI) or better
Noise	0.00005 Abs RMS (500nm) or better
Drift	< 0.0005 A/hr (500 nm, 1-hour warm-up)
Baseline flatness	± 0.0005 Abs or better
Application Software	Compatible Software should be user friendly & simple for data handling with feature like easy to use report publisher, online help and answer wizard, GLP & audit trail and fully compatible with Windows. System built in features such as real time display of concentration, time scan, photometric mode, single/multi-wavelength, capability for event recording (e.g., addition of reagents)

	Software should have built in a. Methods: • Absorbance with one or more wavelengths, • Scans, Nucleic acids, Proteins, OD 600, • Evaluation: via factor, standard and calibration curve • Dual wavelength with subtraction and division evaluation b. Method dependent evaluation: • Absorbance, concentration via factor and standard • Concentration via standard series using Linear regression, Nonlinear regression with 2nd and 3rd degree polynomials • Spline analysis, • Linear interpolation (point to point evaluation) • Absorbance allocation via subtraction and division • Ratio 260/280, 260/230, Molar concentration and total yield for nucleic acids. The software should be 21CFR part 11 compliant.
Accessories and spares	• One pair each of of 0.5, 1 and 3-ml quartz cuvettes 10 mm path length • One pair each of of 0.5, 1, and 3 ml glass cuvettes 10 mm path length • Cuvette holder • Deuterium Lamp • Halogen lamp • Holmium oxide glass filters for wavelength calibration. • NIST traceable Potassium dichromate
Computer and printer	Latest configuration factory set branded PC system with 22-23'' Full HD Monitor with printer –B/W – duplex- laser-legal, A4 - 1200dpi-up to 21 ppm –capacity with network card
UPS	Suitable UPS with 60 mins backup power
Calibration	Certificate from an ISO 17025 accredited lab spectral calibration.
Compliance	**IQ/OQ/PQ** of instrument and Software should be provided along with document
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. • 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
Recommendations or warnings	• Any warning signs would be adequately displayed
Warranty	• Warranted for 3 years after satisfactory installation and working excluding consumable parts and accessories.
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, if any.; • Certificate of calibration and inspection
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

21 REAL-TIME PCR

Application: A Real Time PCR system is used for gene expression analysis, pathogen quantitation, SNP Genotyping, Plus/minus Assays that use an internal positive control and analysis of genetically modified organisms**.**	
Specification	**Requirement**
Hardware	1. The system should be a Peltier based PCR machine supporting all of the following formats: 96-well plate with optical adhesive cover, 96-well plate with optical flats caps, 8-tubes strips with optical flat caps. 2. The normalization of reaction due to non-PCR related fluctuations should be possible by using any passive reference dye. 3. The excitation source should be bright white LED/Laser/halogen and the detection system should be through photodiode/CCD Camera. 4. The built-in emission filters to support a broader range of fluorophores with a higher sensitivity for longer wave length (red dyes). The system should be configured and calibrated to use any of the following dyes or a combination thereof: FAM™, SYBR® Green, VIC®, JOE ™, HEX, TET, BY®, NED ™, TAMRA ™, Cy3®, JUN®, ROX™, TEXAS RED®, and capability of multiplexing for five targets or better. 5. The hardware must provide Peltier thermal cycling with pre-configured mode for Fast-PCR (40 cycles in less than 35 minutes) as well as Standard-PCR run in the same block. 6. System must have flexibility of running 2-3 different temperatures simultaneously in the same run with different set of annealing temperatures in a single run. 7. The system should have temperature range at least 4 ^{o}C-100 ^{o}C to facilitate incubation of samples at low temperature. 8. The system should have peak block ramp rate for heating and cooling exceeding 4.6 ^{o}C/ second with temperature uniformity of 0.4 ^{o}C or better and 0.25 Temperature Accuracy. Vendor should specify the sample ramp rate and should be more than 3.5°C/sec 9. System should support minimum recommended reaction volume of 10 µL and thermal cycling conditions to eliminate optimization of PCR conditions for running the templates from different sources simultaneously although lower would be preferred to minimize reagent consumption. 10. The instrument should have real time quantitative PCR installation specification which demonstrates the ability to distinguish between 1.5-fold templates copies with a confidence level equal to 99.5% or better to be demonstrated with RNase P instrument verification plate required to be done at the time of installation. 11. Installation specifications must demonstrate the ability to detect differences as small as 1.5-fold or better in target quantities

	12. The system should have preferably Touch Screen LCD feature with real time visuals of amplification plots etc to avoid dependency on computer for operation with USB port 13. Latest compatible data workstation with all system software and monitor should be provided with the system
Computer	i. Computer: A business line computer (either notebook or tower) for system control, operation, analysis, net-working of multiple systems and a USB port for data export to Power point, Excel or JPEG file formats with colored laser printer. ii. Installation specifications must demonstrate the ability to detect differences as small as 1.5-fold or better in target quantities
Accessories and startup	Vendor should provide a complete line of reagents including 1) Taq Man universal PCR master mix (500 reactions) 2)SYBR Green master mixes (500 reaction) and disposables including tubes, 96 well plate with optical caps for use with the system for onsite application training after installation and 3) TAQMAN RNase P 96-well instrument verification plate
Software specifications	1. Dedicated licensed full version software for primer and probe design. 2. The instrument should have licensed software that can analyze multiple perspectives in the Multiple Plots view, with side by side views of all data aspects including the amplification plots, standard curve, multi-component data plots, and raw data. 3. The system should also include software to support applications including absolute quantitation, Relative quantitation, multiplex-PCR, allelic discrimination (SNP), high resolution melt curve analysis as well as pathogen detection and plus/minus assay using internal positive control. 4. The instrument software should have a multi-componenting algorithm designed to provide precise deconvolution of multiple dye signals to enable the simultaneous detection of multiple fluorophores, 5. License software should also include and supply statistical analysis tools like Box-Whisker plots to assess Ct distribution, scatter plots and heat maps to assess sample correlation and quality. 6. The instrument software should have experimental design wizard and reaction setup information including pipetting protocols. 7. Should support remote monitoring through a web browser-based software for accessing and analysing data anywhere and anytime in the world
Power Supply	200-240Vac 50Hz
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed

Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
Training	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
List of Spares and Accessories	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
UPS	UPS/ as required for functioning of the equipment with 120 min back up
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

22. GRADIENT THERMOCYCLER

Application: A thermocycler commonly known as a PCR machine is used to amplify short DNA sequences**.** The thermocycler is used in identifying and genotyping of microorganisms and for detection of genetically modified organisms in food	
Specification	**Requirement**
Thermal block	A universal dual block with 96 wells Block should accommodate PCR tubes, 0.2 ml / 0.5 mL (PCR tubes
Screen	Menu driven through color touch screen
Temperature programme	Gradient technology should ensure identical ramp rates in both gradient and normal Capable of Running 4-5 reactions with different annealing temperatures in the same PCR run Gradient optimization should be possible in 0.2 mL PCR tube formats
Temperature range	Gradient temperature range from 35 – 100C
Block temperature control range	4°C to 99.9°C or better
Temperature uniformity	0.5°C or better
Block Temperature Accuracy:	± 0.25°C or better
Temperature control modes	Fast, Standard and Safe' temperature control modes are must
Heating rate	5 °C/second or better
Sample ramp rate	3.5 °C/second or better
Remote monitoring	Instrument must be enabled for remote monitoring
Other features	Should have Time or Temperature increment with cycles in PCR program Features for power save Standby function should be available System should have internal memory to save protocols on board and should have facility of USB memory stick
Power Supply	200-240Vac 50Hz
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
Training	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
List of Spares and Accessories	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

UPS	UPS/ as required for functioning of the equipment with 120 min back up
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

23. SPECTROFLUOROMETER

Application: Fluorescent techniques coupled with multivariate classification methods have been exploited to classify or discriminate foods according to different criteria. An important application is the assessment of food authenticity and adulteration. Important applications for fluorescence in edible oils studies include: authentication of virgin olive oils, discrimination between their different quality grades and geographical origins, and detection of adulteration with low-grade olive oils or other vegetable oils.	
Specification	**Requirement**
Design	Modular, open-architecture spectrofluorometer with ozone free xenon lamp and power supply. Capable of automatic acquisition of corrected emission and excitation spectra, polarization spectra, synchronous luminescence spectra, kinetic studies, temperature dependent studies.
Excitation source	High power ozone free Xenon Arc lamp
Spectrometer - Excitation:	Czerny-Turner monochromator, focal length 300 mm or better, accuracy ±0.3 nm or better, software controlled triple grating turret with grating 1200 lines/mm, around 300 nm blaze for UV-VIS range Excitation range: 250-900 nm, optimized in the UV
Spectrometer - Emission	Czerny-Turner monochromator, focal length 300 mm or better, accuracy ±0.3 nm or better, software controlled triple grating turret with grating 1200 lines/mm, around 400 nm blaze for UV-VIS range Emission range: 250-900 nm, optimized in the Visible
Sample Compartment	Lid activated emission port shutter Large enough to accommodate Polarizer, Filter etc. Peltier thermo tatted single cell holder with magnetic stirrer, -10deg.C to 100 °C, Temp. Ramp: 0.1 °C/min to 20.0 °C/min. Peltier temperature must be software controlled
Detectors	Should allow simultaneous UV-VIS absorbance and fluorescence recording Photon counting detection technique Analog signal output must be available Silicon photodiode reference detector (to monitor excitation source fluctuations) Red sensitive PMT for UV-VIS (up to 850 nm or better)
Sensitivity	Signal-to-Noise ratio for Raman band of water 30,000:1 or better
Computer hardware and software	Suitable computer workstation and all interfacing hardware and software (should be easily upgradable) for instrument control, data control, data acquisition, data storage and data processing for steady-state and time resolved. Multi-user
Essential Accessories System	Absorbance Measurement Accessory Filter Holder with set of 8 filters in UV-VIS range Quartz Cuvette open top with lid, 10mm pathlength, volume 3 ml --- 4 nos. Computer with latest configuration to run total system

Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
After sales service/ Post warranty	1. Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; 2. Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail for IC. 3. Should carry out yearly PM with at least one PM kit 4. Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Training	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
List of Spares and Accessories	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
UPS/Stabilizer	Suitable UPS as required for functioning of the equipment with 60 min back up
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.

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24. ION CHROMATOGRAPH

Application: The Ion chromatograph is used in analysis of various anions and cations including bromate, sulphate, nitrate, nitrite etc in water and other food products. When coupled with ICP-MS system speciation of arsenic (Arsenite and Arsenate), selenium and mercury is possible	
Specification	**Requirement**
Design	Bench top Ion Chromatography system.
Pump	1. Dual Piston Pump –Should be compatible with aqueous elements of pH 0-14 and reversed phase solvents 2. Flow rate range: 0.001 – 10.0 mL/min or more 3. Resolution/increment of flow rate: 0.001ml 4. Maximum Operating Pressure: 0-5000 psi 5. Pressure Ripple/pulsation: 1.0% or lesser 6. Flow Precision and accuracy: 0.1% or lesser 7. Piston Seal: Dual pump head, wash can be continuous when connected to rinse solution supply
Detector	1. One Conductivity detector with temperature controller for detection of anion and cation 2. Conductivity measurement range: 0-15,000 µS 3. Temperature range: 30 to 50ºC 4. Cell volume: <1 µL
Suppressor unit	Resin or membrane based self-regenerating suppressor for both Anions & Cations. Suppressor should have at least 2 years warranty
Column housing	Housing should have built in column heater with temperature range ambient to 70°C and be able to identify the columns and set the optimal operating conditions for column operations
Columns	Two number of Anion Ion – Suitable Anion Exchange column with guard column for the separation of anions (Fluoride, Chlorite, Chloride, Chlorate, Bromide, Bromate, Nitrite, Nitrate, Phosphate, Sulfate), Organic Acids, Oxy Anions etc should be provided along with detailed application notes Two number of Cation Ion – Suitable Cation Exchange column with guard column for the separation of Cations (Alkali-Alkaline Earth Metals), Amines, Ammonium etc. should be provided along with detailed application notes. Two set each of the columns with guard column for Anion and Cation shall be supplied along with the instrument
Injector	Dual position 6 port injector valve with fast response time and controlled through software shall be provided. Suitable autosampler compatible with the Ion chromatograph should be provided
Gases	Suitable Gases/ generators where applicable should be supplied mainly for buffers (mobile phase) to be in inert form.
Computer hardware and software	1. Suitable computer workstation and all interfacing hardware and software (should be easily upgradable) for instrument control, data control, data acquisition, data storage and data processing for steady-state and time resolved. 2. Original Licensed latest version Chromatography Management Software shall be provided

	3. Software should be able to control the system with latest Windows operating system
Computer System	The following configuration shall be provided compatible with system quoted but not limited to 1. Suitable branded computer, with latest Advanced processor with 12 GB DDR3 Memory, Up to 2 TB SATA hard drive or better for software requirements of Ion chromatography 2. DVD-RW 3. 24" LED Monitor with suitable authorized operating system, 4. 4 USB Port or higher configuration. 5. Licensed Windows OS and MS Office to be included in the system 6. Reputed Branded Laser Jet printer (Black and white) – Automatic back to back printing all sizes (A4and legal)
Accessories	1. 100 nos. of vials with caps suitable for IC should be provided. 2. One set of additional tubing required for operation of IC shall be provided. 3. 4 numbers of Mobile phase bottles shall be provided.
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Training	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
List of Spares and Accessories	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
UPS/Stabilizer	Suitable UPS as required for functioning of the equipment with 60 min back up

Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
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25. GEL IMAGING AND DOCUMENTATION SYSTEM

Application: This an imaging and capture system used to document the separated nucleic acids and PCR amplification products by agarose gel electrophoresis of, which helps in evaluating their size, purity etc. By densitometric analysis the concentration can be compared and estimated	
Specification	**Requirement**
Camera	1. 5 Mega pixels (or better), 16-bit Scientific-Grade CCD Camera air cooled equipped with capturing wide angle images from distances as short as several millimeters, shall be equipped with speed USB for fast data transfer 2. Fully automated operation (auto exposure, no focus or other adjustment or calibration needed) 3. Capture modes should be Automatic, semi-automatic, manual (normal/incremental) Multiple capture modes make use of 4-8 orders of dynamic range 4. Afford Flexibility of placing of sample tray at one of two different heights in the sample compartment to produce image-acquisition areas of 220 × 160 mm and 110 × 80 mm, respectively 5. Capable of detecting following • Nucleic Acid stained: EtBr, SYBR Green, Coumarin, Fast Blast • Protein stained with: Coomassie Blue, Silver stain, SYPRO Ruby Red • Western Blots stained with: Colorimetric, Coomassie Blue, Silver stain and Chemiluminescence
Software and PC	1. Automation for image acquisition with integrated data analysis and validation and intuitive workflow, which you can operate from touch screen device, to generate and analyze data quickly and easily 2. Stand-alone Software for enhancement, editing, annotation, archiving & analysis including features like 1-D multilane densitometry, 2-D spot densitometry, MW, contrast adjustment, rotate, cropping, zoom etc. tool for quantity calculation, density, molecular weight, background subtraction, able to optimize capture time for western blots, automatic band and lane detection and automatic and manual analysis. Export to JPEG, TIFF etc files, determination of height, area of the detected bands, and direct link to word and excel 1. PC (Tower or Notebook) should at least have in built 1TB HD for image storage, 6 USB slots, 1 network port, Intel i5 or better at least 8GB RAM, DVD RW drive, key board, optical mouse, 18" or large LED monitor, Licensed version of latest operating system
Power Supply	200-240Vac 50Hz
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language

	• List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
After sales service/ Post warranty	5. Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; 6. Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without. 7. Should carry out yearly PM with at least one PM kit 8. Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Training	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
List of Spares and Accessories	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
UPS/Stabilizer	Suitable UPS as required for functioning of the equipment with 60 min back up
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
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26. ELISA READER WITH PLATE WASHER

Application: ELISA readers detect and process and quantitate biological and chemical data using absorbance (ELISAs, enzyme activity, and nucleic acid and protein quantification), luminescence, and fluorescence detection modes, in the wells of a plate usually 96 or 384 plates	
Specifications	**Requirements**
ELISA Microplate Reader	
Light Source	Quartz-halogen lamp 6V/10W
Wavelength	Absorbance 230-750 nm, Accuracy ±1nm Fluorescence Ex 230 – 850 nm, Em 280 – 850 nm Accuracy < ± 2 nm
Filters	8- position filter wheel, the instrument is delivered with the following standard filters installed: 405nm, 450nm, 620nm and 650nm
Resolution	0.001 Abs
Display	High contrast color display (480 x 272 dots)
Internal Memory	At least up to 99 assay protocols and 100 test results, 96- well plates
Incubator (Optional)	Temperature range from ambient +4^{o} C up to 50^{o} C
Accuracy(405nm)	± 1% (0-3Abs) or ± 0.003 Abs, whichever is greater
Communication	USB for computer connection USB for memory stick position for data export USB for external printer
Mains Input	100-240V(50/60Hz) with IVD specifications
Capability	Capability to read flat-, U-, or V-bottom microplates, 6 / 12 / 24 / 48 / 96 wells and cuvettes
Power Supply	210-240V/50-60 Hz
Detectors	Fluorescence, UV and Visible, Luminescence
Temperature control	Ambient +5 °C to 45°C
Calibration plate	96-well calibration plate must be calibrated for the wavelength (e.g., 630 nm, 650 nm, 420 nm, 450 nm).
Calibration	Calibration certificate from ISO 17025, NABL accredited laboratory
ELISA Microplate Washer	
Function	Fully automatic plate washer With IVD specifications
Compatible	With ELISA reader supplied (as per model)
Capability	Washing of 96 well microplates and strips, with flat, round, or “V” bottom well
Bottle	• With non-pressurized bottle to maintain biosafety • Wash, rinse and waste (volume 4-6 liter)
Residual volume	< 2 µl
Dispensing volume	50-400 µl for 96 well plate
Plate sensor	Should have the provision
Data Transfer	USB Port Number of wash protocols up to 99
Number of Wash buffer bottles	One
Validation	For validation vendor should having it own capability with their own company trained service engineer to perform validation. No third part validation will be entertained. One validation at the time of installation should be done by company personnel.
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided

	Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories.
After sales service/ Post warranty	1. Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; 2. Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. 3. Should carry out yearly PM with at least one PM kit 4. Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Training	The supplier should provide comprehensive training to users on operation of the instrument and application support onsite as per specifications
Accessories	Spare Lamps 2 Nos. Multichannel pipette (2 nos) with pipette tips and calibration certificate should be provided.
List of Spares and Accessories	All spares and accessories for both ELISA reader and Plate washer along with part number must be listed
UPS back-up 30 mins	Branded compatible online UPS with at least 30 minutes backup
Certificates required	• 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
IQ/PQ/OQ Compliance statement Payment	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification. Payment only after installation, validation and performance demonstration

27. KARL FISCHER COULOMETER

Application Also known as Moisture meter. Karl Fischer titration is widely used for direct analysis of water content in various foods, as a reliable and robust method. In food industry it is used for water content determination in fruit juices, honey, flour, noodles, chips, cocoa powder etc with water content less than 1%.	
Specifications	Requirements
General design	The instrument should be equipped with integral magnetic stirrer and inbuilt printer and RS232C/USB connector for balance interface and computer. The display panel and key pad should be attached with the main unit.
Titration Method	Coulometric Karl Fischer Titration
Measuring Range	10 µg to 100 mg water or better
Resolution/Sensitivity	0.1 µg H_2O
Precision	± 3 µg in 10 µg-1000 µg range and 0.3 % (maximum) above 1.0 mg
Display of Unit for Moisture	ppm, µg, mg/kg, %.
End Point Detection	AC Polarisation Constant current Polarisation method
End Point Indication	Visual Display/ Print out/ Acoustic beep
Titration vessel	Low drift cell design with no grease or PTFE sleeves
Drift correction	Automatic Control
Maximum Titration Speed	2.0 mg H_2O/minute or better
Maximum Electrolysis Current	400 mA (Automatic electrolysis current control)
Start/End Delay Time	It should have option for Start/End Delay Time
Calculation Modes	w/w, w/dilution, volume/density, v/v
Method Memory	Yes
Battery Operation	Yes
List of accessories to be supplied	Titration Vessel 01 No. Detector Electrode with Lead 01 No. Generator Electrode (with Frit) with Lead. 01 No. Desiccant Tube and Cap 01 No. Injection Septa (Pack Of 10) 01 No. Gas Tight Syringe 1.0ml 01 No. Luer needle 17-gauge 01 No. Dust Cover 01 No. Results Manager Software 01 No. Main Power Pack 01 No. Fuse 05 No. Karl Fischer Titration Reagent(s) 02 Sets NIST Calibration standard 02 No.
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Calibration certificate	Calibration certificate from ISO17025 for Temperature and Relative humidity.

Warranty	2-year after satisfactory installation and working excluding consumable parts and accessories.
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Training	The supplier should provide comprehensive training to users on operation of the instrument and application support onsite as per specifications
List of Spares and Accessories	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
Battery backup	Suitable rechargeable battery
Quality Requirement	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
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

28. AUTO TITRATOR

Application: The auto titrators are suitable for all of the titrations required in food analysis namely acid-base titrations, precipitation titrations as well as complexometric and redox titrations. Applications include Citric/tartaric acid in fruit drinks, calcium in milk, sulphur dioxide in wine etc	
Specifications	**Requirements**
Principle of operation	Volume determination by equivalence point and end point.
Instrument details	Microprocessor controlled titration unit (vortex type) and control unit and shall also comprise the following: 1. 10 ml and 20 ml burette with tubing, connector & Teflon coated valve: 2 Nos each 2. Temperature sensor 3. Moisture filter 4. Glass dispensing tip 5. 150 ml. Glass beaker 4 Nos. 6. Stand for mounting all above items 7. Electrode for aqueous titration – pH combination 8. Reagent bottles
	The automatic titrator shall be accompanied with the following accessories: 1. Electrode pH glass body combination 2. Electrode for argentimetric / precipitation titration – silver pin combination 3. Electrode for redox titration – Platinum pin combination 4. Electrode for complexometric titration – silver pin combination glass with amalgamation.
Combine functionality	Offered auto titrator must have functionality for determination of pH and for performing aqueous titration, redox titration, argentometric / precipitation titration, complexometric titration and silver assay
mV range	± 3000 mV or higher
Accuracy	± 0.10 mV or better
Polarized sensor range	0 to ± 3200 mV
Polarized sensor resolution	0.10 mV or better
Burette resolution	1 µL
Fill and drain time	Burette for Fill and Drain Time : 20 s
Titration head	Manual stand with swiveling arm
Stirrer System	Instrument must have propeller stirrer which prevent vortex formation and enables better mixing for fast response of electrode with variable speeds and also prevents electrodes from breakage due to magnetic type of stirrers.
End point detection	Potentiometric and voltametric
Cut-off criteria	Volume, pH/mV and endpoint
Special feature	Auto titrator should perform fast, reliable, and reproducible automated titrations. Auto burette recognition It should have a mode for performing automated calibrations program and save at least 100 user defined methods with password protection.

	It should provide flexible pH, redox, and ion concentration titrations. The unit should also have feature of equivalence point titrations, preset pH or mV endpoint titrations. Auto titrator should have minimized downtime with easily replaceable burettes, tubing, and dispensers. Auto titrator should have a feature to leave unattended in running condition until titration is completed. Provision to connect electrode with BNC connector and also for differential electrode
Memory	Auto titrator should have memory to store at least 100 titration data sets with date/time stamp, transferable to printer, computer, or USB drive.
Display	Minimum 7" touch screen display with LCD graphic display The display should clearly show online graph of titration trend and also the status of burette filling & dispensing
Report format	Parameters and results Data table for mV, pH, mV/ml, and volume (µL) Titration curve mV v/s µL
Workstation	Computer latest model exclusive for use with Potentiometric Auto titrator to be provided with appropriate licensed software. Laser jet printer to be supplied.
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Calibration certificate	Calibration certificate from ISO17025
Warranty	2-year after satisfactory installation and working excluding consumable parts and accessories.
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Training	The supplier should provide comprehensive training to users on operation of the instrument and application support onsite as per specifications
List of Spares and Accessories	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
Battery backup	Suitable rechargeable battery/Suitable rating UPS
Quality Requirement	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
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

29. WATER ACTIVITY METER

Application: Used for the measurement of water activity or equilibrium relative humidity (ERH) a key parameter in the quality control of moisture sensitive products or materials. .	
Specifications	**Requirements**
Design	Portable Dew point sensor Rapid reading: in 5 minutes or less Large LCD Digital display Data logging function with SD card Easy to clean
Measurement Range	Range: 0 to 1.0 a_w
Water Activity Accuracy:	± 0.01
Sample Temperature Range	15 to 50 ◦ C
Sample Temperature Accuracy	± 0.2 ◦ C
Sample Temperature Resolution	0.1 ◦ C
Sample Dish Capacity	8.0 -15 mL full
Accessories	Humidity standards for calibration (water activity levels: 0.150, 0.500, 0.760, 0.984) Sample dishes (min. 3 nos) Power cables Cell protection filters
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Calibration certificate	Calibration certificate from ISO17025 for Water Activity and Equilibrium Relative Humidity.
Warranty	2-year after satisfactory installation and working excluding consumable parts and accessories.
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified

Training	The supplier should provide comprehensive training to users on operation of the instrument and application support onsite as per specifications
List of Spares and Accessories	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
Battery backup	Suitable rechargeable battery/Suitable rating UPS
Quality Requirement	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
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

30. FT-IR WITH ATR & LIQUID CELL

Application: Fourier Transform Infrared (FTIR) analysis is a spectroscopic technique that uses wavelengths between 2,500nm and 25,000nm (Infra-Red region). It is particularly useful for testing liquid samples such as oil, milk and wine and it requires little or no sample preparation.	
Specifications	**Requirements**
General	Fully Computer Controlled Compact FT-IR system with universal sample compartment. System must incorporate an automated internal NIST Traceable Polystyrene film Sample module must be automatically identified • Should have latest digital signal processor • Indicator for operational source and laser
Wave number measurement range	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	Instrument alignment and performance to be immune to minor mechanical disturbances Reliable calibration mechanism Auto subtraction of CO_2 and H_2O absorptions
Sample analysis	Provision for investigation of both solid and liquid samples
Sample holder	Standard sample cell holders for both liquid and solid samples
Accessories	1. Variable temperature Sample cells / Jackets for solid samples – 2 nos 2. Variable temperature Sample Cells / Jackets (KBr windows) for liquid samples – 5 nos 3. 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) 4. Hydraulic Press with KBr die and Pellet Holder 5. Suitable Mortar Pestle (dia 5-6 cm) 6. Suitable Portable De Humidifier to maintain 30- 60% RH 7. Temperature and Relative Humidity Digital Indicator with calibration certificate from ISO 17025 accredited lab. 8. Reference NIST Standard Polystyrene film (0.3 mm) over the range of 3800 cm^{-1} to 650 cm^{-1}.
Attenuated Total Reflectance	• 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

Temperature range	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
Vacuum pump	Suitable high-quality vacuum pump (preferably oil free) for variable temperature cell
Data processor and software	Licensed software should have real time data collection and should have the facility to continuously monitor the performance of source, detector, power supply and laser. Software applications: Auto calibration, Compare Software, Spectral Search; Quantitative Analysis, Automatic atmospheric suppression; Spectral interpretation for unknowns; Quality checks programs Built-in libraries for edible oils and any other foods Compatible Computer + Monitor + accessories – with latest RAM, suitable software and with Licensed Windows installed with Laser printer
Power requirements	230 V / 50 Hz – 230V/60Hz
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Calibration certificate	Polystyrene film over the range of 3800 cm^{-1} to 650 cm^{-1} from ISO17025 laboratory
Warranty	2-year after satisfactory installation and working excluding consumable parts and accessories.
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Training	The supplier should provide comprehensive training to users on operation of the instrument and application support onsite as per specifications
List of Spares and Accessories	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
UPS	Suitable rating UPS (60 min back-up)
Quality Requirement	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
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

31 ABBE'S DIGITAL REFRACTOMETR

Application: The Abbe refractometer owes its popularity to its convenience, its wide refractive index range (nD =1.3 to 1.7), and to the minimal amount of sample needed. It is widely used to determine the sugar content in liquids and fruit juices, check the alcohol content of wine and beer, and to monitor and control the quality of yoghurt, jam, fruit extract, syrup, coffee extract, chocolate, milk, baby food etc. by measuring the total solids.	
Specifications	**Requirements**
General	It should be a small foot print battery powered with a single Eyepiece with digital display Measurement of liquid, and viscous samples, regardless of their turbidity, viscosity, transparency and absorption.
Measurement prism	Optical glass
Light source	LED (Approximating to wavelength of D-Line)
Wavelength	589 nm
Scale	1. Refractive Index 2. Brix
Measurement Range	Refractive index (nD): 1.3000 to 1.7000 Brix: 0.00 to 95.00% (5 to 75 ^{o}C ATC)
Resolution	Refractive index (nD):0.0001 Brix: 0.01 % Temperature: 0.01^{o}C
Measurement Accuracy	Refractive Index (nD): ±0.0004 Brix: ±0.03% *When measuring a standard sucrose solution of up to 50% Brix or standard refractive index solution in MODE 1 at 20°C
Repeatability	Refractive Index (nD): ±0.0002 Brix: ±0.01% *When measuring a standard sucrose solution of up to 50% Brix or standard refractive index solution in MODE 1 at 20°C
Temperature control range	5.0 to 75.0 °C (No lower than 10 °C below the ambient temperature and no higher than 55°C above the ambient temperature)
Calibration standards	Calibration block: 1 No and contact solution (1-Bromonaphthalene) and any other standard solutions
Modes	MODE -1 Displays the measurement value once the sample reaches the target temperature MODE: 2 Measures Refractive index and temperature at fixed intervals and displays the estimated measurement value at the target temperature MODE-3 The thermo-module can be turned off. Without temperature control, the measurement value is displayed in 4 seconds after the START key is pressed MODE – S:12 Displays the measurement value once a certain level of sample stability is achieved
Power requirements	230 V / 50 Hz – 230V/60Hz

Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Performance certificate	From at least two institution where same model has been installed in the previous 2 years
Warranty	2-year after satisfactory installation and working excluding consumable parts and accessories.
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Training	The supplier should provide comprehensive training to users on operation of the instrument and application support onsite as per specifications
List of Spares and Accessories	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
UPS	Suitable rating UPS/stabilizer (30 min back-up)
Quality Requirement	Calibration certificate from ISO17025 accredited laboratory. Should be FDA/CE/BIS approved product. Manufacturer and Supplier should have ISO 13485. 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
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument.
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

32 HIGH PERFORMANCE THIN LAYER CHROMATOGRAPHY SYSTEM

Application: The HPTLC is used for identification, quantification of various analytes in food safety analysis. These include aflatoxins, patulin, artificial color etc.	
Specifications	**Requirements**
General	Integrated HPTLC system for identification, quantification, finger printing, micro-preparative separations on TLC plate with following items: automated TLC applicator, Scanner, UV cabinet, photo-documentation, TLC plate heater, immersion device, TLC chamber, software, computer system, printer, UPS, nitrogen cylinder with regulator etc.
Automatic TLC/HPTLC sampler	Fully automatic TLC Sample Applicator, System Manager control or stand-alone mode. Fully automatic application of samples as spots, bands or rectangles. By spray or contact application. Should accepts 10, 25 or 100-µL syringe. Minimum application vol. 10 nL. Syringe cleaning automatic and programmable. Complete with instrument cover. Sample rack for more than 60 standard 2 mL vials
Automatic Developing Chamber with Humidity Control	Automatic Developing Chamber for fully automatic development of TLC and HPTLC plates 20 x 20 cm, 20 x 10 cm and 10 x 10 cm (glass, plastic, aluminum). Development in 20 x 10 cm twin trough chamber must be possible. Solvent front detection by CCD must be possible. Activity and preconditioning of the layer, chamber saturation, developing distance and final drying can be pre-set and automatically controlled by the system. Sensor monitored humidity control must be present, which allows reproducible chromatography at defined activity of the layer.
TLC / HPTLC Scanner with Data Evaluation	• System Manager controlled Scanner / Densitometer for automatic spectrum scanning for identity check as well as purity check; • Automatic quantitative measurement by absorbance & fluorescence; • All TLC / HPTLC plate sizes must be acceptable; • Scan speed 100mm/sec @ 25µm resolution; • Wavelength range 190-900 nm; • Monochromator flushing by nitrogen; • Data sampling rate – 4000 / sec; • Special Macro optics for TLC & Micro optics for HPTLC. Spectrum scan speed 100 nm / sec; • Max 999 spectra / plate; • Visible pilot slit image / scan compartment illumination with UV to check sample alignment with scan beam; • D2, Hg, W lamps must be built-in. • Plate can be easily placed inside scanner • Data evaluation 32-bit software (latest version), Good S/N ratio. High reproducibility;

	• Controlled by system Manager, automatic / manual data integration, Auto baseline correction. • Spot check facility. • 3D display with data storage and auto calculation of each peak at its λmax. • Calibration - single level, multilevel, linear / non-linear. Statistics CV / CI. Reproducibility check facility. Auto calculation of data from wts and dil. factors must be present. Lamp use tracking. Service Dialog + Self Diagnostics + Tutorial all built – in. Meets GLP. • Optional IQ-OQ and 21 CFR Rule 11 certification.
Software for Scanner	• Spectrum Scanning option • Scan Quantification • Multi Wavelength evaluation: • Measures, stores and calculates automatically quantitative results from up to 30 wavelengths. Data stored & 3-D displayed in 3 ways. • Colour plots of data. • Automatic quantification with respect to λ max of separated fractions, in absorption & fluorescence mode. • Spectrum Library: Facility to create your own library. All files searched automatically for λ max as well as Rf.
TLC / HPTLC Plate Heater	For in-situ derivatization and layer activation, stain resistant ceramic glass top; temp range 25 to 200 °C. Uniform heating of plate. Digital display of set & actual temperature. Display remains on as long as plate is hot. Up to 20 x 20 cm size plates
Derivatizer	Must have micro-droplet spraying technology for derivatization of TLC plates, highly homogeneous reagent distribution through optimized droplet size, recommended settings for the most common derivatization reagents, safe and environmentally friendly operation through closed system, intuitive handling and easy cleaning. Both 20x20cm & 20x10cm TLC/HPTLC plates compatible with 2ml derivatization reagent consumption for 20 x10cm plates & 4ml for 20 x 20cm plate
UV Viewing Cabinet	Latest model of dual wavelength 254 nm + 366 nm with guaranteed minimum intensity, Full protection to viewer's eyes and skin from UV light for safety. High tech 50 kHz power supply for flicker less, guaranteed illumination intensity. Auto switch off after 10 min. Enables to inspect the plate as well as keep a record by photo-documentation.
Plate Immersion Device for Derivatization	Uniform distribution of derivatization reagent. Suitable for 20 x 20 cm & 20 x 10 cm plates; Universal plate holder clamp; Dipping speed - 30 mm to 50 mm /sec., variable; Dip time - 1 to 8 secs. + indefinite. Ribbed and narrow dip chambers for low volume of reagent.

	Battery operated. Complete with 20 x 10 cm dip tank & lid.
Professional TLC / HPTLC Photo-documentation System under GLP	For fully automated image documentation at 254nm, 366nm and visible light. Illumination Unit, Camera and HPTLC specific software must be present. **Illumination unit** – • with 254 + 366 nm UV and Visible light (from above & below the plate). • Uniform illumination. 60 KHz supply for instant, flicker less illumination. Easy access for changing tubes & filters and PCB. • Auto switch off. • Total darkness. • Viewing window to observe plate in UV. • Safety - UV switched off if door opened. **Camera 48-bit, high resolution industrial camera head (248 grey level resolution)**. • Images of the highest quality. • True colour capture. • Very linear response. Individually calibrated. • Camera must be PC operated and does not have any controls. Image data and report through system manager software only, with ability to generate tamper proof data. **HPTLC Specific Software** – Automatic image optimization, exposure time to suit brightest zone within dynamic range of CCD. Full function annotation. Rf scale. Child image with or w/o ROI (Region of Interest) blow up. Auto image capture at 254nm and or 366nm and/or white light. Spot application tool to detect faintest fractions. High speed data transfer, control by system manager. Options to process the image. High Resolution Documentation software for IQ-OQ, performance check, clean plate correction, image averaging, image subtraction, white adjust and flat field corrections. n. **Image comparison viewer software**: Allows comparison of different tracks from different plates under GLP. A must for accurate comparison. Extremely user friendly. Can create artificial plate with relevant data.
Chromatogram Development Chambers	All glass molded, one piece, bubble free chamber for TLC/ HPTLC. Bottom divided into two equal halves with a sloping divider. Chamber top and bottoms (both outside the chamber and inside the two troughs) should be perfectly parallel to each other. Chamber ground finish on top for good seal and at bottom for perfect level. Heavy chamber to minimize effects of vibration.

	One-piece joint less molded chambers to prevent leakage and tough to handle while cleaning. Stainless steel, rust proof lid with overhang to completely seal the chamber. 1. 20x20 cm, - 2 no 2. 20x10 cm – 2 no 3. 10x10 cm.- 4 no
Accessories	1. N_2 cylinder with double stage regulator: 2 no 2. TLC precoated plates 20 X 20 cm silica gel F254 on Al foil – 5 Box TLC Cutter 2 no
Data processing Computer	The following minimum configuration or better: Precision T7910 XL processor: E5-2667 v3 (8C HT, 20MB Cache, 3.2GHz Turbo); RAM: 32 GB (4x8GB) 2133MHz DDR4 RDIMM ECC; 4x2 TB SATA 7.2k RPM HDD; 512MB NVIDIA Quadro NVS 310 (2DP). Monitor: 27 inches; Licensed Microsoft Office: compatible version with the operating system.
Power requirements	230 V / 50 Hz – 230V/60Hz
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Performance certificate	From at least two institution where same model has been installed in the previous 2 years
Warranty	2-year after satisfactory installation and working excluding consumable parts and accessories.
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Training	The supplier should provide comprehensive training to users on operation of the instrument and application support onsite as per specifications
List of Spares and Accessories	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
UPS	Suitable rating UPS/stabilizer (60 min back-up)
Quality Requirement	Should be FDA/CE/BIS approved product. Manufacturer and Supplier should have ISO 13485.

	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
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument.
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

PART B: AUXILIARY EQUIPMENT

1. CENTRIFUGE (REFRIGERATED)

Application: A Multi-functional, general purpose High speed refrigerated bench top centrifuge used for sedimentation of samples with easy lift and safety lid Centrifuge is used for sedimentation of particles	
Specification	**Requirement**
Base Unit	• Table top centrifuge with maintenance free brushless motor and have low access height • CFC free refrigerant • LCD Digital Display of time, speed and Temperature and run conditions • Compatible with all fixed angle and swinging bucket rotors • Automatic rotor recognition facility • Automatic imbalance detection and cut-off • Should be programmable with easy preset programs for fast temperature for pre-cooling and short spin. • Should have motorized lid lock system
Temperature Range	0 ºC to 30 ºC
Speed	Maximum speed: 20000 RPM (with no load

Rotors	• **Fixed Angle Rotor** for
	  • 50 ml bottles
	  • 15 ml Falcon tube
	  • 1.5-2.0 mL Eppendorf tubes and adaptors for 0.2- and 0.5-mL tubes/ Eppendorf
	• **Rotor for 2.0 mL** Eppendorf tubes (12 places or better) with RPM 20000
	• **Deep-well micro plates rotor** Two 96 well plates for swing out type with RPM 3500
	• **Swing out rotor:**

Accessories	Bottles, falcon tubes, adapters etc One set of Other items (rotors/adapters) required for improving the applicability/system performance should to be quoted as optional
Power Requirement	220 v to 240 v -50 Hz If a voltage stabilizer is required, it should be supplied along with the unit
Voltage stabilizer	Suitable voltage stabilizer to be provided
Certificates Performance and Safety Standards	Should have necessary certification for safety and quality standards from national/ international bodies Optimum safety according to national and international regulations (IEC 1010
Supplier/ Manufacturer	Must be ISO and CE certified for quality
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.

Recommendations or Warnings	Any warning signs should be adequately displayed
Warranty	Warranted for 2-year, extendable up to 3 years, after satisfactory installation and working excluding consumable parts and accessories.
Training	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
List of Spares and Accessories	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
Voltage stabiliser	Suitable voltage stabilizer as required for functioning of the equipment
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

2.DEEP FREEZER (UPRIGHT)

Application: Deep freezers are used to store samples, reagents & kits, reference materials at low temperature i.e. around -10 ºC to -30ºC.	
Specification	**Requirements**
Type	Vertical
No of Door	Single
Position of Door	Front
Type of Insulation	PUF
Frost Free	Yes
Type of Cooling	Direct
Castor	Heavy Duty Lockable
Capacity	: 250 L or higher
Shelves/ Drawers	Sealed 5-7 pullout drawers / shelves of different sizes that can be adjusted for storage flexibility
Material Of Chamber Interior	Stainless steel, preferably 304 grades
Material of Chamber Exterior	Stainless steel, preferably 304 grades
Door Material	Stainless steel, preferably 304 grades
Finish	Powder coated exterior finish
Temperature Range	- 10 °C to - 30 °C
Temperature Uniformity in Degree Celsius	±3 °C or less
Temperature Stability of System in Degree Celsius	±3 °C
High Quality Door Seals	Yes
Lockable Outer and Inner Lids	Yes
Control	Fully programmable microprocessor controlled with membrane keypad and eye level control panel
Display	**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, sudden power failure, system failure and battery low
Temperature History	Data logger for temperature and temperature history which can be downloaded via a USB port Yes
Should Have Battery Back Up for The Display and Security Lock for The Display	Yes
Refrigerants	CFC-Free, HCFC-Free non inflammable refrigerants
CO_2 cylinder should be supplied with freezer for backup	Yes (Optional)
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided

	Advanced maintenance tasks documentation, if any.
Warranty of complete unit)	3 Year from the date of satisfactory functioning
Warranty of stabilizer in years	3 Year
Warranty of compressor in years	10 years or more
Service Support	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer
List of Spares and Accessories	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
Voltage Stabiliser	Stabilizer as required for functioning of the equipment
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

3.ULTRA LOW TEMPERATURE VERTICAL DEEP FREEZER

Application: Used for long time storage of various biological products including, plasmid, plasmid DNA, viruses and chemicals, certified reference materials or material testing components for a longer period of time	
Specification	**Requirements**
Type	Vertical
Interior	Full stainless steel which can be easily cleaned and eliminates any possibility of rusting
Position of Door	Front
Type of Insulation	PUF
Frost Free	Yes
Capacity	Capacity: 100 L or higher with minimum 4-6 racks that can be adjusted for storage flexibility
Type of Cooling	Direct
Castor	Heavy Duty Lockable
Shelves/ Drawers	Sealed 5-7 pullout drawers / shelves of different sizes that can be adjusted for storage flexibility
Material of Chamber Interior	Stainless steel, preferably 304 grades
Material of Chamber Exterior	Stainless steel, preferably 304 grades
Door Material	Stainless steel, preferably 304 grades
Finish	Powder coated exterior finish
Temperature Range	- 40 °C to - 80 °C
Temperature Uniformity in Degree Celsius	±3°C or less
Temperature Stability of System in Degree Celsius	±3°C
High Quality Door Seals	Yes
Lockable Outer and Inner Lids	Yes
Control	Fully programmable microprocessor controlled with membrane keypad and eye level control panel
Display	Easy to read, LED control panel and alarm status with integrated diagnostics
Acoustic Safety alarms	Should be equipped with alarms for • High/Low Temp • Hot Condenser • Power Failure • High/Low Voltage • Sensor Error • High Ambient Temp • Door Ajar
Temperature History	Data logger for temperature and temperature history which can be downloaded via a USB port Yes
Should Have Battery Back Up for The	Yes

Display and Security Lock for The Display	
Refrigerants	CFC-Free, HCFC-Free non inflammable refrigerants
CO_2 cylinder should be supplied with freezer for backup	Yes (Optional)
Accessories	Rack Holders and cryo-boxes
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Warranty of complete unit)	3 Year from the date of satisfactory functioning
Warranty of stabilizer in years	3 Year
Warranty of compressor in years	10 years or more
List of Spares and Accessories	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
Voltage Stabiliser	Stabilizer as required for functioning of the equipment
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.

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4.FUME HOOD

(Heavy Duty High Suction)

Application: It is a safety equipment used in all chemical laboratories to limit human exposure to hazardous or toxic fumes, vapours or dusts. Fume Hoods with floor mounted systems are designed to meet the challenges when working with chemicals, chemical fumes and other flammable materials etc. with a high degree of efficiency.	
Specification	**Requirement**
Coupling	Direct
Balancing	Dynamically
Type of Filter	HEPA
Overall Dimensions / Working Size	The system should have following Overall Dimensions: • Overall Length of Fume Hood: 1500 -1550 mm • Overall Width of Fume Hood: 750 - 1500 mm • Overall Height of Fume Hood: 1500 – 2500 mm • Length of Base Cabinet: 1000 – 1500 mm • Height of Base Cabinet: 700 - 800 mm
Body Features	• Double Wall Construction • Body thickness: 10 mm (Min.) • Completely made from GI sheet with Highly corrosion resistant epoxy powder coating • Inner Chamber - Chemical & Heat Resistance, Fire retardant, smooth finish, easily cleanable, made out of durable PRL sheets of thickness 5 mm (Min.)etc. • Should be provided with Fume Hood installation Kit and Accessories • Should be provided with Safety Device Trip
Working Table Top	• Granite / M.S Powder Coated Sheet Covered with P.P Sheet/ SS 304 • Thickness – 18 mm (Min.)
Utility connections	• Should be provided with Utility Pipe lines for Nitrogen, Compressed Air, Water
Outer Covering (MoC)	CRC, 18G, Epoxy Powder Coated
Exhaust Duct	• Chemically Resistant, PVC/PP duct pipe • Provided with bends, dampers, transitions and clamps up to blower • All joints should be curved in order to avoid any backtracking of fumes and a smooth flow to exhaust fumes • Two exhaust ports connected to the fume hood exhaust system internally
Sink & Tap	• Size: 100 – 200 mm • Shall made of chemically resistant material • No leakage shall observe from Outlet Nipple • Shall be provided with Single way / Three-way swan neck tap
Baffle Arrangement:	Removable, Chemically Resistant PVC Back Baffle to capture and remove/ slide fumes instantly at faster speed Three-point suction system (for light, normal & heavy fumes) with baffle to ensure smooth and immediate removal exhaust of fumes.

Exhaust Blower & Motor	• Motor: Centrifugal Type, Motor • Blower: 1.0 HP motor (3 phase, 50Hz, AC Supply) with phase MCB. Direct Driven, totally enclosed fan-cooled (TEFC), Squirrel Cage Induction Motor • Chemical & heat resistance heavy-duty epoxy coated • Min. 4 Watt
Scaffold/ Grid	Should be provided to hold the chemicals and apparatus
Door / Sash/ Shutter	• Thickness – 4 mm (min.) • Material - Toughened Glass • Door vertical Folding Type with adjustable height
Air Flow	• Low Constant Volume Exhaust Type • Approx. 100 cubic meter/ hour
Noise Level	Not more than 65 dB
Face Velocity	0.5 m/s or 100 feet per minute
Shelves in Base Storage Units/ Cabinets	Number – 2 Type – Movable (With or Without Wheels)
Illumination	Florescent Lights – 2 nos. (Min.), 40 Watt
Electrical Arrangements	• Min. 2 Nos. 15/5 amps 3 pin electric socket • Switch for blower; • Switch for Lightings
Power Requirement	220/ 230 Volts
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	Warranted for 1-year, extendable up to 3 years, after satisfactory installation and working excluding consumable parts and accessories.
Training	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
List of Spares and Accessories	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
Quality Requirement	• 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 • All calibration certificates must be from ISO 17025: 2017 certified laboratory

IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
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5.HOMOGENIZER

Application: A homogenizer is used for the proper mixing and comminution of the food sample to obtain a homogenous mixture prior to analysis	
Specifications	**Requirement**
General	• It should be macerating and homogenising of a variety of high moisture, high-fat and fibrous samples such as meat, fish, fruit, vegetables, prepared foods frozen meals, etc. • Should allow frozen food samples to be homogenised in a short period of time, providing more.
Motor	Powerful 1500 rpm single phase motor
Bowl	It Should have 3.5 litre or better, stainless steel bowl.
Sample capacity	0.1 – 1.5 kg sample capacity for homogenization
Mode	Pulse mode for frozen food applications
Blades	Blades should be multi-purpose stainless steel micro teeth blades as per standard SS316. Extra stainless-steel bowls and smooth blade cutter should be provided (01 Set).
Safety	A magnetic safety switch should be available from being operated without the transparent cover in the locked position.
Power supply	230V/50Hz, single phase with inbuilt/external protection for high/low voltage.
Documentation	Supplier should be provided IQ/OQ/PQ documents as per along with operator manual.
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	Warranted for 1-year, extendable up to 3 years, after satisfactory installation and working excluding consumable parts and accessories.
Service Support	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer
Training	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
List of Spares and Accessories	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
Voltage Stabiliser	Supplied with a suitable voltage stabiliser
Quality Requirement	• 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 • All calibration certificates must be from ISO 17025: 2017 certified laboratory
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
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6.HOT AIR OVEN (FORCED AIR CONVECTION OVEN)

Application: Hot air ovens are used in the lab to determine the moisture content of food products and for drying glassware	
Specification	**Requirements**
Size	Inner Volume 200 – 250 L
External Body	Mild Steel with powder coated
Internal Chamber	Stainless Steel 304 Grade
Insulation	Mineral Wool/ Ceramic Wool
Door	• Inner: Stainless Steel 304 Grade • Outer**:** Powder coated Mild Steel • Self-closing magnetic lock having door sealing material suitable to high temp
Adjustable Shelf	2– 3 Perforated Stainless-Steel shelves (Removable) 304 Grade
Shelf Rest Pitch	30 mm
Temperature Range	37 ^{0}C to 300 ^{0}C
Least Count	0.1^{0}C
Temperature Accuracy	± 0.5^{0}C or better
Temperature Uniformity	±2^{0}C or better
Heating Element	Nichrome wire / Kanthal A1
Time to attain Maximum Temperature	Approximately 90 minutes
Control Panel	Door mounted Digital LCD display for set temperature, attained temperature, set time, heating ON/OFF
Preset Timer	• With buzzer • Digital display of time • Least count- 1 minute
Circulation Method	Blower
Power Source	220-240 V, Single phase
Exhaust Port	30 mm ID on opposite side walls
Safety Device	• Self-diagnosis function including overshoot/undershoot of temperature and over current protection • Audio Visual alarm for door opening after 2 minutes
Optional Requirements	• Dot Matrix Printer interface • Temperature chart recorder • PLC Controller • Audio / visual alarm • Extra shelves • Heating Thermostat • Manufacturer calibration certificate for three different temperature points from ISO 17025/NABL accredited laboratory
Operating manuals, service manuals, other manuals	Should provide: • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.

Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	Warranted for 2-year, extendable up to 3 years, after satisfactory installation and working excluding consumable parts and accessories.
Training	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
List of Spares and Accessories	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
UPS	Suitable on - line UPS (10 KVA) to support the instrument.
Quality Requirement	• 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 • All calibration certificates must be from ISO 17025: 2017 certified laboratory
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
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7.HOT PLATE

Application: Hot plates are generally used to heat liquids. Some hot plates also contain a magnetic stirrer, allowing the heated liquid to be stirred automatically	
Specification	**Requirement**
Heating Plate	• Top Plate Material - Cast Iron • Top Plate Finish – Ceramic Coated resistant to acids, bases • Body Material – Mild Steel • Finish – Powder Coated • Should include a separate Temperature Control Unit with PTFE or any acid resistant cord connection • Ideal for heating samples and concentrated acids
Size (Dimension) & Shape	10 x 12 inches (minimum), Rectangular or Circular
Max. Heating Plate Temperature	Maximum temperature 550°C and accept up to 2L flasks /1L beakers
Controller	Energy Regulator
Power Supply	220 / 230 Volts, 50 Hz
Optional	• Overhead stirrer • PID Controller • Stainless steel heating plate • Support stand • Digital setting and display for temperature and time • Hotplate warning display while cooling till below 50 ^{o}C
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed.
Warranty	Warranted for 2-year, extendable up to 3 years, after satisfactory installation and working excluding consumable parts and accessories.
Training	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
List of Spares and Accessories	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
Quality Requirement	• 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 • All calibration certificates must be from ISO 17025: 2017 certified laboratory
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

8.HOT PLATE CUM MAGNETIC STIRRER

Application: Hot plates are generally used to heat liquids. Some hot plates also contain a magnetic stirrer, allowing the heated liquid to be stirred automatically	
Specification	**Requirement**
Set-up plate material c	Ceramic
Set-up plate dimensions	180 x 180 mm
Number of stirring positions	1
Stirring quantity max. per stirring position (H2O)	20 L
Motor rating output	9 W
Direction of rotation	Right / left with automatic reverse rotation yes
Speed and Temperature display set-value /actual	LCD rpm/°C
Speed and temperature control	Turning knob
Speed range	50 - 1500 rpm
Speed deviation (no load, nominal voltage at 1500rpm and 25 °C)	± 2 %
Stirring bar length	30 - 80 mm
Self-heating of the set-up plate by max. stirring	1 °C at RT:22°C/duration:1h)
Heat output	1000 W
Temperature setting range	0 - 100 °C
Temperature setting resolution	2°C
Heat control accuracy of heating plate (at 100°C)	±5 °C
Connection for ext. temperature sensor PT1000,	Yes
Timer	Yes
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately display
Warranty	Warranted for 1-year, extendable up to 3 years, after satisfactory installation and working excluding consumable parts and accessories.
Training	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

List of Spares and Accessories	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
Quality Requirement	• 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 • All calibration certificates must be from ISO 17025: 2017 certified laboratory
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
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Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
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9.MICRO FILTRATION UNIT

Application: Used for the collection and preparation of samples, mobile phases, and buffers to obtain the highest quality results for downstream analysis	
Specification	**Requirement**
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. 90 mm disc filters 3. 25 mm filters
Stainless Steel Vacuum Filter Holders	Analytical Filter Holders For 25- and 47-mm disc filter.
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.
Filter Forceps	Highly polished stainless-steel forceps blades with beveled, un-serrated tips to prevent damaging the membrane filter.
Oil less vacuum pump	Flow rates of up to 37 L/min
Membrane Filters	Filters 47mm, 90 mm and 25 mm for a) Aqueous solvents b) Hydrophobic solvents
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

10.MICROWAVE DIGESTION SYSTEM

Application: Microwave digestion is a common technique used for elemental analysis. It is used to digest the food samples.	
Requirement	**Specification**
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 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 Design	The system should be a standalone 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 of temperature and power against time and temperature of individual vessels.
Interlocks	The system should have good interlocking system for safety and cavity door.
Rotor & Vessel Assembly	High pressure and high temperature rotor with at least 15 PTFE vessels, work station & torque wrench. Vessels on the rotor should be segmented for easy use. Maximum Temperature capacity of vessel up to 300 degree C Pressure capacity of vessel up to 100 bar (1500 psi) Vessel volume should be: One set for vessels of volume between 10 and 15 ml, and one set for vessels of volume > 25 ml, Vessel Material- PTFE-TFM Every vessel must have a vent-and-reseal spring to safely release the pressure in case of overpressure. Burst-disk membrane or self-releasing / continuous venting device are not suitable due to very low performance.

	Safety shield should be of PEEK reinforced with glass fibre Must be supplied with digestion vessel racks and suitable accessories for the handling of two sizes of digestion vessels Additional twelve numbers of vessels (of both sizes) as specified above should be supplied along with the system
Magnetron	Dual Magnetron system with rotating microwave diffuser for homogenous microwave power distribution in the cavity. Microwave frequency should be 2450MHz and installed power should be 1900W minimum (two magnetrons minimum 950W each) and should provide the temperature needed (300 °C) for difficult samples
Microwave Cavity	The cavity should be made of non-magnetic Rugged high-grade 316 solid steel cavity/ stainless-steel housing with PTFE plasma coating applied at 350 °C for corrosion resistance. Also, all hardware should have 5-layer protective coating for the resistance from acid, alkali and corrosive gases. The Cavity should be constructed with The vessel assembly during a run should be visible from outside
Hardware & Safety	a. 18/8 stainless steel housing with multilayer PTFE coating with a large flange with36 mm ID. Additional multiple ports on the side walls of the microwave cavity b. Protected against acids and solvents with polymer coating on both inner and outer surfaces c. Self-resealing pressure responsive and explosion resistant door to ensure d. maximum safety even in case of overpressure release ***e.*** Door completely made of 18/8 stainless steel. ***Glass door is not acceptable due to safety reasons*** f. Independent door safety interlocks to prevent microwave emission g. Built-in exhaust system located above the microwave cavity and separated from the electronics to prevent corrosion h. Magnetron protection from reflected microwave power i. Continuous and PID-controlled microwave emission at all power levels
Sensors	1. Temp sensor should be integrated in the system for monitoring & controlling each vessel and cavity temp. Temperature of each vessel should be displayed 2. The software should automatically reduce the microwave power in case of over temperature avoiding sample loss 3. 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: User interface	Software must allow the user to edit, save and run multistep unlimited number of methods (minimum 2000) The software must control all parameter online and display temperature, time and power directly on the terminal/computer. The control terminal should have high resolution LED/LCD Acid Resistant display. Touch screen

	Should have provision for manual programming storage apart from pre-installed program Continuous display of temperature and power inside the reaction vessels is required
Output	1. One (1) parallel Centronix for external printer (HP Deskjet series) 2. Three (3) RS-232 serial ports for connecting PC (for data base reporting and programming of the unit), balance and service check
Computing	Embedded dedicated PC (most recent processor), 22" Full HD LED Monitor, Laser Printer dual side printing
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. • 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 • GLP-validated software for controlling the system
Supplier/ Manufacturer	Must be ISO certified for quality
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs should be adequately displayed
Warranty	Warranted for 2-year, extendable up to 3 years, after satisfactory installation and working excluding consumable parts and accessories.
Service Support	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer
Training	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
UPS/Stabiliser	Suitable stabiliser or on - line UPS (10 KVA) to support the instrument.
Quality Requirement	• Product certification: CE / FDA / BIS certified. • Manufacturer and Supplier should have ISO 13485 certification. • Should provide calibration certificates from NABL accredited agency every year during warranty & CMC period. Calibration cost will have to be borne by the supplier. • 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

	• GLP-validated software for controlling the system
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

11.MUFFLE FURNACE

Application: A muffle furnace generates the high-temperature up to 1200 °C and turns the sample into ash. The chemical composition can be determined easily after determining the ash content. It is the best way to determine the quality and levels of silica of the food products.	
Specification	**Requirements**
Inside Chamber Volume	a. 5 L or better b. With lift door with hot surface facing away from the operator and swing aside door at the front
Furnace construction	1. Double shell steel case with cooling fan to keep outside case cool 2. High purity alumina fiber insulation for max. energy saving
Temperature Range	900 - 1600 ^{o}C
Standard Working Temperature	1200^{o}C
Temperature accuracy	+/- 1.0 ^{o}C
Heating element	The chamber section should be heated by six to eight Super Kanthal Molybdenum disilicide heating elements (Super 1800 grade MoSi2) suspended in a chamber made of high temperature refractory fiber lined with a combination of ceramic fibre blankets
Heating rate	The furnace should be of fast heating type with the maximum attainable temperature should reach as a ramp function in less than one hour.
Thermocouple	Pt. Pt. Rh. Thyristor controller will be provided along with the furnace to measure the temperature with Recrystalized alumina sheath & connecting holder complete set.
Temperature Control	• PID automatic and programmable power control with necessary safety features • Over-temperature limiter with adjustable cut-out temperature for thermal protection class 2 in accordance with EN 60519-2 as temperature limiter to protect the furnace and load
Cooling Fan/ Air Circulation	Attached with Furnace, provided inside the control unit to protect Costly component
Maximum power	Up to 8 KW
Accessories to be supplied	Al_2O3 Sample Plate 1 pcs Al_2O_3 Furnace Door Block 1 pcs Protection Glove 2 pairs Crucible Clip 1 pair Crucibles 6 pcs
Calibration Certificate	From ISO 17025/NABL accredited laboratory
Installation, training and commissioning	Vendor must ensure satisfactory installation and commissioning of the system.
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed

Warranty	2- year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
Training	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
List of Spares and Accessories	Provide list of allessential spares and accessories
UPS	UPS/Stabilizer as required for functioning of the equipment
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

12. FROST FREE REFRIGERATOR

Application A refrigerator is used for storing reference material, standards, buffers and other reagents media etc	
Specifications	**Requirement**
Material	Stainless steel
Capacity	Approx. 500 liters and above
Adjustable Shelves	Tempered glass shelves 05 No.
Temperature Range	Digital display and temperature controls Refrigerator +2º to +8ºC Freezer -20 ºC
Audio alarm	Alarm is door is ajar for long
Inner body	Rust Free Material
Refrigerant	CFC / HCFC Free
Frost Free	In built Voltage Stabilizer Door Glass Heater for special heated front glass that enhances visibility and prevents unhygienic condensation Warranty 2years and Life time on motor
Door Lock & Interior light	High/Low cut with timer delay
Temperature Control	Same Temperature: Top to Bottom Microprocessor based Temperature Controller with Digital Display
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

13.VACCUM OVEN

Application: Vacuum Drying Oven is suitable for drying out liquids or solvents contained in food samples. The moisture lost from the sample out of the vacuum oven, which prevents the accumulation of moisture within the oven. The boiling point of water is reduced when it is placed under vacuum. Drying foods in a vacuum oven therefore has a number of advantages over conventional oven drying techniques. Drying is quicker. And can also be carried out at lower temperatures so problems associated with degradation of heat labile substances can be reduced.	
Specification	**Requirement**
Useful volume	30 Litre (Max.)
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
Insulation	Alumina fiber insulation
Skin temperature	Maintained just above ambient
Number of trays	Two SS Trays (Min.)
Heating elements	Heater provided around the chamber
Operation	Single phase / AC 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/ Digital gauge Vacuum pump: Vacuum pump oil free Timer: Special timer for vacuum system
Operating manuals, service manuals, other manuals	Should provide: • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	1 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
Training	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
List of Spares and Accessories	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
UPS	UPS/Stabilizer as required for functioning of the equipment

Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

14. VORTEX MIXER

Application: Vortex Mixer is a general-purpose laboratory equipment. It is used for mixing liquids in test tubes. It operates at various speed and can be operated continuously or by "touch" activation**.**	
Specification	**Requirement**
Speed and control	User settable 200 - 3000 rpm or better
Operating Modes	ON (continuous), OFF, and TOUCH mix
Head	Standard rubber cup
Base	Heavy metal with Four suction cups
Movement	Orbital type movement
Accessories	Flat head Horizontal head, 12 x 1.5 mL Horizontal head, for 4 x 15 mL
Low Speed Operation Should Be Possible in Touch Activated Operation	Yes
Operation Type	Low Noise
Power Supply	200-240Vac 50Hz
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
Training	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
List of Spares and Accessories	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
UPS	UPS/Stabilizer as required for functioning of the equipment
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies

IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

15. CIRCULATING cum SHAKING WATER BATH

Application: Circulating baths are constant temperature water baths that enable rapid heating and cooling of samples by constantly circulating water. Water baths are primarily used incubate samples contained test tubes, flasks and beakers etc. An integral pump circulates the bath water within the tank to maintain uniform temperature. The sample containers can be mechanically agitated	
Specifications	**Requirements**
Temperature Range	Working temperature range from +20°C to+99.9 °C
Display	Bright LED-Display with cutting-edge microprocessor technology with PID temperature control
Volume	Bath volume ~10-12 liters (one) Bath volume ~18-20 liters (one
Power	Power switch integrated in keypad
Temperature Stability / Uniformity @ 37°C	±0.02 °C
Adjustable shaking frequencies	Adjustable shaking frequencies from 20 to 200 RPM
Maintenance	Convenient bath drains to easily clean and maintain bath
Top cover	Lift-up bath cover
Alarms	Audible alarms for Dry-running protection and over temperature
Timers	Optimize scheduling with auto-on and auto-off timers
Accessories	Stainless Steel / Polypropylene Test tube rack, for 15-21 tubes of 23-25 mm, 25 -60 tubes of 12-16 diameter(each) 1nos Spring tray/ racks for Erlenmeyer flasks (250/500 mL)
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories.
Training	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
List of Spares and Accessories	Provide a list of all spares and accessories with part numbers
UPS	UPS/Stabilizer as required for functioning of the equipment
Quality Requirement	• 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
IQ/PQ/OQ	Instrument must be provided with all IQ/OQ/PQ documents

After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

16. ORBITAL SHAKER

Application: Shaking incubators are combination of traditional incubators and a laboratory shaker used to simultaneously incubate and shake or agitate samples. They are ideal for laboratory working on cell culture, cell aeration and solubility experiments.	
Specifications	**Requirements**
Shaker requirements	• Single knob selects all operating conditions and quickly Triple-eccentric counter balanced drive • Acceleration circuit to prevent sudden start and stop should be available • Programmable controller offering up to 4 modes of timer and parameter control for reduced user intervention. • Timer 0.1 to 99.9 hours or continuous mode • UV germicidal lights. • Noiseless operation
Shaking Speed range	25 to 400 rpm with ± 2 rpm accuracy
Temperature range	20°C below ambient to 80°C with accuracy of ± 0.1°C and stability of ± 0.2°C at 37°C
Shaking orbit	approx. 25 mm
Display	Large, easy to read LCD display screen
Audible and Visible Alarm	Should indicate when speed deviates more than 5 rpm or temperature deviates more than 1°C from set point, and when timer operation has expired.
Overall dimensions	Minimum 62 x 75.4 x 82 cm (W x D x H)
Accessories	1. Universal Platform of at least 45 x 45 cm having capacity to holds assortment of various size of flask sizes up to 2 Ltrs and test tube racks. 2. System should be supplied with 125ml clamps (10 Nos.), 250 ml clamps (5 Nos.), 500 ml clamps (05 Nos.), 1000 ml (02 Nos.) and 2000 ml (01-02Nos) 3. Test tube rack for 20x50ml tube-1 no and test tube rack for 42x15ml tubes-1
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least).
Training	Training of personnel After supply, training on instrument operation and troubleshooting etc., to be given to all laboratory personnel.
UPS	UPS/Stabilizer as required for functioning of the equipment
Quality Requirement	• 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

IQ/PQ/OQ	IQ/OQ/PQ of instrument and Software should be provided along with document
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

17. WATER PURIFICATION SYSTEM

Application: Ultrapure water purification system is required for purification of water and making it free of contaminants that interfere with microbiological analysis. An ultrapure water system is equipped with ultra-filters to remove endotoxins, DNase and RNase left over from bacteria destroyed by UV, resulting in extremely low total organic carbon (TOC) and having a resistance of up to 18.2 MΩ/cm.

Specifications	**Requirements**
General	• Compact, Wall mountable/benchtop system for microbiology / molecular biology/LC-MS/MS grade water applications. • Should deliver ultra-pure product water by point of use dispenser with flexible dispenser, volumetric dispensing and auto shut off facility.
Quality of water	Should deliver Type I/Ultra– pure as per International specifications as follows: • Electrical Resistivity Min. 18.2 MΩ/cm @ 25°C • Conductivity 0.055 µS/cm compensated to 25°C • TOC level (system with UV lamp) <5ppb • Flow rate > 1 lit / min • Bacteria <1 CFU/100 ml • Particulates(size>0.22µm) <1/mL • Sodium (ppb)< 1 • Chloride (ppb) < 1 • Total Silica (ppb) < 3
Storage	System should come with an inbuilt storage system of 5-8 L to store consistently high-quality pure water for prolonged period and prevent Contamination by ambient air.
Feed water	Should have separate feed water (Potable tap water) specific purification cartridge and application specific polishing cartridge
Control display	Should have calibrated meters for continuous monitoring and display of water quality parameters: Product water resistivity / conductivity both compensated and non-compensated mode, product water temperature, Alarms for product water resistivity greater or below set point
	Should have display for maintenance: sanitization, exchange purification cartridges, activation of fast flush, depressurization, air purge etc.
Consumable	Must Quote separately for consumables (cartridges, filters etc.) for ONE YEAR for trouble free working.
Validation	For validation vendor should having its own capability with their own company trained service engineer to perform validation. No third part validation will be entertained. One validation at the time of installation should be done by company personnel.
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed

Warranty	1 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least).
Training	The supplier should provide comprehensive training to users on operation of the instrument and application support onsite as per specifications
Accessories	All cartridges, filters, pump or any such item which is /are essential for Installation and functioning /operating the equipment.
UPS	UPS/Stabilizer as required for functioning of the equipment
Quality Requirement	• 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
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument.
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

18. PCR HOOD (Bench Top)

Application: This a PCR hood which is used for contamination control with filtered & sterilized air circulation for setting up of PCR reactions	
Specification	**Requirement**
Design	Bench top PCR workstation with work area not less than 70 x 50 cm Body and panels made from ethanol resistant material Stainless steel Working table
Prefilter and HEPA filter	Active decontamination with either Prefilter & HEPA filter or UV Air Recirculatory to create a particulate-free work area HEPA filter rated at 99.9% efficient to remove particle down to 0.3 µm Prefilter rated at > 60 % efficient to remove particle down to 6 µm
Illumination	Equipped with fluorescent white light in the interior and suitable UV tubes (254 nm) in the interior and timer
Safety warnings	Safety shut-off switch to turn off the UV light when door is opened
Power outlets in hood	Integrated power outlets (Minimum 2 Nos) for operating small lab equipment (e.g. vortex, mini centrifuge, etc.)
Power Supply	200-240Vac 50Hz
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
Training	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
List of Spares and Accessories	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
UPS/Stabilizer	Suitable UPS as required for functioning of the equipment with 60 min back up
Quality Requirement	• 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

	• Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

19. CENTRIFUGAL VACUUM CONCENTRATOR

Application: The centrifugal vacuum concentrator is used for rapid and efficient drying of small-volume DNA/RNA/extracts samples by centrifugation with consistent drying times. This allows the dried sample to be obtained as a pellet	
Specification	**Requirement**
Centrifuge	1. Maintenance-free induction motor and cold trap 2. Chemical resistant lids, inner chambers and rotors
Vacuum	Oil free vacuum pump
Drying Temperature	Ambient and ~60°C
Timers	Timer for heat and run times
Safety	Should be equipped with automated over-temperature safety shutoff.
Rotation speed	Fixed 1400 rpm
Rotor	Fixed Angle Rotors to accommodate 24 x 1.5 - 2.0 mL and adaptors for 0.5ml and 0.2ml tubes should be provided
Power Supply	200-240Vac 50Hz
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
Training	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
List of Spares and Accessories	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
UPS/Stabilizer	Suitable UPS as required for functioning of the equipment with 60 min back up
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number;

	Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

20. AGAROSE GEL ELECTROPHORESIS SYSTEM

Application: It is used for rapid, routine acrylamide/agarose gel electrophoresis of nucleic acids and PCR amplification products, which helps in evaluating their size and purity	
Specification	**Requirement**
Gel electrophoresis unit	a. Gel Electrophoresis Base Unit for running gel sizes of 5±2 × 7 cm and 10 ±2 × 7 cm with safety lid. b. Two removable UV-transparent gel casting trays with provision for tape-free gel pouring c. Should be supplied with 2 numbers of 1.5 mm thickness, 8 well combs d. Should be supplied with 2 numbers of 1.5 mm thickness, 12 well combs e. Should be supplied with 2 numbers of 1.5 mm thickness, 16 well combs f. Should be supplied with 2 numbers of 1.0 mm x 8 well combs g. Should be supplied with 2 numbers of 1.0 mm x 12 well combs h. Should be supplied with 2 numbers of 1.0 mm x 16 wells combs i. Buffer Capacity not more than 200 mL j. LED Display and safety fuse
Power Supply, Dual Mode (250 Volt, 500mA**)**	a. Dual control modes (constant voltage or constant current) with automatic cross over b. Shutdown timer (0-24 hr) c. Four sets of recessed connectors d. LED Display and safety fuse e. Automatic shutdown of DC power when last electrophoresis unit is disconnected
Power Supply	200-240Vac 50Hz
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
Training	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
List of Spares and Accessories	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
UPS/Stabilizer	Suitable UPS as required for functioning of the equipment with 60 min back up

Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

21. VERTICAL GEL ELECTROPHORESIS SYSTEM

Application: It is used for rapid, routine Polyacrylamide Gel electrophoresis (PAGE) and SDS-PAGE of proteins, which helps in evaluating their size and purity and detection by immunoblotting	
Specification	**Requirement**
Vertical 1-D Gel electrophoresis unit	1. The Gel tank (with lid) should be capable of running 2 mini gels simultaneously 2. The gel tank should be compatible with handcast gels and precast gels. 3. Supplied with tank, lid, companion module, buffer dam and power cable 4. Equipment should be supplied with 4 gel casting units, 8 combs of (10well and 12well) X 4 each; 4 spacers, 4 sets of glass of 1mm thickness & notch plates 5. The length of the hand casted gel should be minimum 8 cm or better 6. Total buffer volume for 2 gels:700-800 ml 7. Molded polycarbonate construction.
Power Supply, Dual Mode	1. Output: 10-300 V (Adjustable by 1V); 4-400 mA (Adjustable by 1mA); 75 W max with constant voltage or constant current (interchangeable) 2. 4 pair of banana jacks in parallel 3. Time setting (adjustable): 1min- 99 h 59 min with pause/resume function 4. LED display 5. Can operate at 0-40 °C; 0-95 % humidity in absence of condensation 6. All safety features including detection of no-load, rapid resistance change, ground leak, over-load, short-circuit 7. Over-voltage protection and over-temperature protection 8. Power Input – 220VAC, 50/60 Hz
Semi-dry Blotting System	The blotter should have an inbuilt power supply system sufficient for simultaneously transferring up to 2 mini-sized gels (8-10cm). (Should not rely on external power supply) Capable of semi-dry transfer of proteins from polyacrylamide gels in ≤60 min or faster Should be compatible with nitrocellulose or PVDF membranes Should use constant current or Voltage for transfers The blotting surface should be Platinum/ Pt-Ti coated and the lid should be stainless steel Should have at least 3 variable pre-programmed transfer protocols based on the number of gels & molecular weight. Should have Audible alarm for end of run. Should be able to store 20 or more programmable methods for voltage and amp. Should be an open system which accepts accessories and consumables from different suppliers. Should have monochrome/ LCD /touchscreen interface
Component compatibility	Vertical 1-D Gel electrophoresis unit, Power Supply, Dual Mode and semi-dry blotting apparatus should be of same brand for better compatibility.

Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
Service Support	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer
Training	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
UPS/Stabilizer	Suitable UPS as required for functioning of the equipment with 60 min back up
Quality Requirement	• 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 • Should have necessary certification for safety and quality standards from national/ international bodies
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.

Payment	Payment only after installation, validation and performance demonstration

22. GLASSWARE WASHER/DRYER

Application: Glassware washer and dryer is an automated equipment designed to wash and dry laboratory glassware such as beakers, flasks, and test tubes.	
Specifications	**Requirements**
Chamber volume of Washer/ Dryer	Option 1: 150 – 200 liters capacity Option 2: 200 – 275-liter capacity. Please quote for both the above options
Internal chamber type	Inner chamber, washing arms and tank filters made of high quality AISI 316 L stainless steel.
Front Glass Door	Glass Door version – Inside chamber must be visible, while in washing/drying run.
Control System	Soft touch LCD display. Microprocessor controlled.
Cleaning Liquid Dispenser	• Minimum two automatic internal liquid dispenser • Standard pre-programmed cycle • At least 10 pre-programmed standard cycles.
Internal wash temperature control	Fully adjustable wash temp. up to 90 ° C
External tap water filtering system	Must include all external tap water filtering system, preferably from local supplier
Internal Baskets for placement of glassware inside	Must include basic 3 or 4 multipurpose baskets for storing test tubes, beakers, conical flasks, round bottom flasks, pipettes and petri dishes.
Built in Dryer Unit	Built in forced air dryer unit for drying entire glassware content after the wash/rinse cycle.
Consumables required for washing/ drying cycle	• Must provide all necessary washing chemicals for 100 wash run cycle. • All quality washing chemicals must be easily available in Indian market at reasonable price (Indian Rupees). • Imported washing chemicals/ consumables are discouraged.
Installation and Commissioning	The vendor must carry out the installation and commissioning at site, including the installation of tap water filter system. The tap water inlet and drain will be provided at site.
End User Training at site	Necessary end user training and instructions must be provided to all users at site.
List of present users in India	Must provide the list of users/ customers of this equipment in India.
Desirable Specification:	• Telescopic bearing railing for loading the basket. • Operator and Service manual with all spare parts list.
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed

Warranty	2 year after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least).
After sales service/ Post warranty	1. Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; 2. Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. 3. Should carry out yearly PM with at least one PM kit 4. Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Training	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.
List of Spares and Accessories	List of all spares and accessories with part numbers
UPS	Suitable on - line UPS (5 KVA) to support the instrument.
Quality Requirement	• 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
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

23. DIGITAL THERMOHYGROMETER

Application: The thermo hygrometer measures both humidity and temperature of the laboratory environment. It is useful instrument for maintaining optimal temperature and humidity inside the lab.	
Specifications	**Requirements**
Temperature	-20 °C to 60 °C ± 0.5 °C Readability 0.1 °C
Temperature accuracy	±0.5°C - ±1.0°C
Resolution	0.1°C
Temperature Update Rate	500 ms
Data storage capacity	99 points
R.H. Range	5 % to 95 % R.H. ± 2.5 % - % RH readability
Display	Backlit dual display of humidity and temperature
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Calibration certificate	Calibration certificate from ISO17025 for Temperature and Relative humidity.
Warranty	2-year after satisfactory installation and working excluding consumable parts and accessories.
After sales service/ Post warranty	1. Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; 2. Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. 3. Should carry out yearly PM with at least one PM kit 4. Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Training	The supplier should provide comprehensive training to users on operation of the instrument and application support onsite as per specifications
List of Spares and Accessories	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
Battery backup	Suitable rechargeable battery
Quality Requirement	• 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
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

24. NITROGEN EVAPORATOR

(Bench Top)

Application: The evaporator is used for evaporating solvents from extracts for concentration prior to chromatographic and other analysis	
Specifications	**Requirements**
General	A bench top work station Microprocessor based, High speed, small volume workstation to accommodate 50 tubes of different capacity (1.5 mL to 30 mL), through Gas vortex shearing action for evaporation. Each 10- position row can work independently Closed system with exhaust facility All racks to be supplied
Operation	Simultaneous automated concentration of multiple samples and unattended operation, automatic gas shut off and operational diagnostics
Display	LED/LCD
Pressure display	Bar/PSI/KPA unit selection
Keypad	Feather touch operation
Thermostatic water bath	Temperature range ambient to 90°C or better Temperature Accuracy: +/-10 °C
Gas Regulator and Gauge Range	0 to 30 psi.
Nitrogen gas generator	• Microprocessor based with external compressor • CE certified for their performance and quality for trace analysis. • Flow rate: 500 mL/min • Delivery pressure: > 5.0 bar • Purity:>99.5% • Noise level: < 50 dB.
Accessories	• Evaporation tubes- 500 Nos • Gas connection tubes – 20 m. • Power cable – 1No • Fuse -10 Nos
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Calibration certificate	Calibration certificate from ISO17025 for Temperature and Relative humidity.
Warranty	2-year after satisfactory installation and working excluding consumable parts and accessories.
After sales service/ Post warranty	1. Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; 2. Should have a good after sales service/technical support capable of reaching at short notice the places

	where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. 3. Should carry out yearly PM with at least one PM kit 4. Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Training	The supplier should provide comprehensive training to users on operation of the instrument and application support onsite as per specifications
List of Spares and Accessories	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
Battery backup	Suitable rechargeable battery
Quality Requirement	• 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
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

25. ROTARY EVAPORATOR

Application: The system would primarily be used for efficient and gentle evaporation of solvents under control boiling point applying precise vacuum.		
Specifications	**Requirements**	
General	Complete equipment from the same source of manufacturing for compatibility & integration Single point operation for all set parameters Single point ON/OFF for all attached accessories e.g. Chiller/Vacuum Pump	
Rotary evaporator	Protection class	IP 21
	Condenser Surface Area	1400 ~ 1500 cm^2
	Heating Bath control	RT to 220°C with set and actual temp. display
	Maximum Safety	The glass parts should be Plastic Coated
	Speed	20 ~280 RPM
	Lift:	Motorized/Electronics
	Rotation direction	Option for Bi direction rotation
	Sensors:	Option for foam sensor
	Default Supply:	With 1 L Receiving and Evaporating Flask
	Display:	RPM, Heating bath temperature, Height movement
	Operating Voltage	100-240V
	Operating Voltage	100-240V
Vacuum pump	Mode	Speed and Valve control
	Observation	Glass window for easy maintenance
	Default mode	Speed control
	Suction Capacity	1.8m^3 /h
	Maximum Number of Steps (Heads)	2
	Final Vacuum	5mbar
	Power consumption	180W
	Operating Voltage	100 ~ 240 V 50Hz
	Sound Level	32-57 dBA
Vacuum controller : :: : : : y:	Display Screen	4'3 LCD Display
	Display Parameters	Heating Bath Temp/RPM/Chiller Temp/Vacuum Options: To fix on rotary evaporator or Vacuum pump

	Protection class	IP 21
	Detection	Automatic detection of Heating Bath Temp
	Library	Common 63 solvent with auto detection of required vacuum
	Facility	Can be used independently if required
Re-circulating chiller	Cooling capacity	550W cooling power @15ºC
	Temperature range	-10°C to +25°C
	Voltage	230V, 50/60 Hz
	Temperature Display	Resolution 0.1 C
	Refrigerant	R-134a, CFC free refrigerant
	Temperature regulation accuracy	+/-1 °C
	Tank volume	3.0 L
	Flow Rate	2.5 L/min
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.	
Recommendations or Warnings	Any warning signs would be adequately displayed	
Calibration certificate	Calibration certificate from ISO17025 for Temperature and Vacuum.	
Warranty	2-year after satisfactory installation and working excluding consumable parts and accessories.	
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified	
Training	The supplier should provide comprehensive training to users on operation of the instrument and application support onsite as per specifications	
List of Spares and Accessories	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	
Battery backup	Suitable rechargeable battery/Suitable rating UPS	
Quality Requirement	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
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

26. ULTRA SONIC BATH

Application: Used for cleaning fitters, mixing, homogenization, dissolving and dispersion of particles in solvents.	
Specifications	**Requirements**
Tank capacity	5 liter or more (along with lid cover & drain valve)
Ultrasonic power	50 Hz or more
Ultrasonic frequency	0 to 40 KHz(variable with accuracy ± 2 kHz) (Ultrasonic power and frequency should be variable to form uniform cavitation in tank)
Heating temperature	1 to 100 °C with accuracy ± 1 °C (Temperature should be variable from 1 to 100 °C). Suitable chilling unit should be provided to achieve the desired temperature
Timer	Electronic digital timer (in 'min: sec ~ 00:00' format) with automatic switch on/off
Control panel	Digital indicator & auto-controller for temperature, ultrasonic frequency and electronic digital timer
Material of construction	All parts including accessories should be made of AISI-304/316 or equivalent stainless-steel material
Accessories	SS mesh baskets- 2 Nos Perforated trays - 2 Nos Beaker holder - 2 Nos Conical flask holder - 4 Nos Test tube holders - 2 Nos. Glass bottle holder - 2 Nos. Toolkit, cleaning accessories and spare parts
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Calibration certificate	Calibration certificate from ISO17025 for Temperature
Warranty	2-year after satisfactory installation and working excluding consumable parts and accessories.
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Training	The supplier should provide comprehensive training to users on operation of the instrument and application support onsite as per specifications

List of Spares and Accessories	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
Battery backup	Suitable rechargeable battery/Suitable rating UPS
Quality Requirement	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
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

27. NITROGEN GENERATOR

Application: Nitrogen is used as a gas in several applications especially as an evaporating gas and Gas chromatography.	
Specifications	**Requirements**
General	The system should be of modular design, compact in size, automatic operation, minimum noise level, low operational cost. Nitrogen should be generated from the atmospheric air. Whole system should be compact and properly assembled without any leakage with operating voltage 230v50 Hz The equipment should be capable of running for 24 hrs. round the year
Installation	Indoor Should work in temperature range of 15 to 30 °C in humidity range of 60-90%
Flow rate	250 ml/min
Purity	Better than 99.999%, :< 0.05 ppm Total Hydrocarbons
Delivery pressure	80 PSI or above
Method of Purification	Pressure Swing Adsorption Technology
External Air Compressor	Suitable air compressor for inlet of feed air with necessary drier & filters & 5 m 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 Compressor should have air buffer vessel so as to heave compressor operating in phases. Automatic on off modes depending on pressure side the compressor
Sound level	Nitrogen generator should have silent operations with max 25 dB and compressors sound level should be less than < 80 dB. so that is can be kept inside the laboratory
Fittings	1/4'' Swagelok for outlet N2 and Inlet Air (if compressor is not installed
Power consumptions (watt):	• ≤ 500 W
Safety-	It should have safety system with safe alarms Automatic on off modes depending on pressure side the compressor
Power requirements	230 V / 50 Hz – 230V/60Hz
Accessories	Provide all the accessories
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Calibration certificate	Calibration certificate from ISO17025 for sound level and evidence for N2 purity

Warranty	2-year after satisfactory installation and working excluding consumable parts and accessories.
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Training	The supplier should provide comprehensive training to users on operation of the instrument and application support onsite as per specifications
List of Spares and Accessories	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
UPS	Suitable rating UPS
Quality Requirement	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
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

28. DRY BATH INCUBATOR MIXER WITH HEATING AND COOLING

Application: Dry bath incubation with heating or cooling for routine use in enzyme assay protocols as well as solubility studies with precise temperature control and with interchangeable modular blocks to accommodate various size tubes.	
Specifications	**Requirements**
General	1Compact unit for mixing with heating & cooling feature with all the required accessories and parts and with Anti-spill technology and flexibility for different exchangeable blocks and provided with all accessories required to make it fully operational
Mix function	Short mix and interval mix function
Top	Thermotop to prevent condensation & maintain temperature homogeneity
Temperature Controller	PID Digital
Operating Temperature Range	4 -100° C
Temperature accuracy	≤1°C or better
Maximum Heating Rate	6°C per min or better
Maximum Cooling Rate	2.5°C per min or better
Mixing speed range	300-3000 rpm
Display	Simultaneous display of set and actual time and temperature
Heating blocks	for 0.2 ml, 0.5 mL and 96-microtiter plates
Accessories	Exchangeable Blocks for 1.5 ml tubes 5 ml tubes 15 ml tubes 50 ml tubes Cryotubes PCR 384 plates 12 mm tubes 1.5 ml vials 2 ml 1.5-2 ml cryo tubes
Power requirements	230 V / 50 Hz – 230V/60Hz
Accessories	Provide all the accessories
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Calibration certificate	Calibration certificate from ISO17025 for three different temperatures from ISO 17025 certified laboratory
Warranty	2-year after satisfactory installation and working excluding consumable parts and accessories.
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number;

	Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Training	The supplier should provide comprehensive training to users on operation of the instrument and application support onsite as per specifications
List of Spares and Accessories	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
UPS/Stabilizer	Suitable rating UPS/Stabilizer
Quality Requirement	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
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

29. LABORATORY GRINDING MILL

Application: Mills grind by means of a high-speed rotating steel hammers or discs and are equipped with a sieve before the sample leaves the grinding chamber. By selecting different sieves, the particle size can be varied such that homogeneous samples are produced.	
Specifications	**Requirements**
General	Cyclone type bench top sample mill (Lab scale).
Grinding speed	Micro switch- based system with high grinding speed (10000 rpm) for the grinding of samples like grains, seeds, cereals, hard boiled confectionery etc
Grinding principle	Turbine and sieve
Grinding ring	Made of tungsten Carbide/Copper Impeller-standard (aluminum).
Sample volume	Should be able to grind samples with different moisture levels i.e. from 10% or less to 15%
Sample composition	Should be able to grind samples with up to 15% moisture and/or fat content up to 20
Final particle size	Should have capability to grind sample size of up to 10 mm or more; Should have grinding rate of ≥4g/sec Should have provision for adjustable particle size; Should be supplied with Screen sieves for 0.5 mm, 2 mm, 1 mm, 0.8mm, 0.3 mm should be provided for defined particle size There should be no/ minimum thermal degradation of the sample during grinding Should be approved by AOAC for sample preparation for different purpose
Noise level	Low noise level of ≤75 dBA
Accessories	Sample bottles 100 to 125 ml and seal Accessory to enable pouring of samples into the milling zone Dust collection accessories Seal kit Minimum 50 sample bottles (UV protected) with sealing lids
Power requirements	230 V / 50 Hz – 230V/60Hz
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Calibration certificate	Calibration certificate for noise level and particle size from ISO17025 laboratory
Warranty	2-year after satisfactory installation and working excluding consumable parts and accessories.
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument

	is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Training	The supplier should provide comprehensive training to users on operation of the instrument and application support onsite as per specifications
List of Spares and Accessories	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
UPS/Stabilizer	Suitable rating UPS/Stabilizer
Quality Requirement	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
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

30. AUTOMATED SOLID PHASE EXTRACTION SYSTEM

Application: The Solid Phase Extraction (SPE) performs automated rugged and reliable extraction and clean-up of large volume liquid samples for further analysis by LC-MS/MS, GC-MS/MS with positive pressure loading and elution of sample and solvents with parallel evaporation. Provides a high through put system for processing samples simultaneously	
Specifications	**Requirements**
General	It should be configured as module on x-y movement head line/rail/platform of Main Unit. Automated Solid Phase Extraction module should to carry out automated SPE steps: cartridge condition, sample loading, cartridge drying, and elution, elute evaporation and concentrating, reconstitutions and solvent exchange.
SPE cartridge station	The SPE process should be performed in a highly reproducible and reliable manner: It should have 1. Positive liquid displacement 2. SPE cartridges station for 1, 2, 3and 6ml 3. 1-3 ml and 6 ml SPE cartridge tray with more than 25 position 4. Tray holder for more than 3 sample trays of various size SPE cartridges 5. Gripper for plastic transport adaptors 6. Preparation syringes modules and 2.0 to 2.45 ml syringes 2 numbers 7. Supplied with more than 20 cartridges of 6 ml with adaptors 8. Solvent reservoirs 4 numbers of 1 L solvent bottles 9. Solvent filling station for four solvent positions of 1 L solvent reservoirs of each and two waste position 10. Sample vials of 2 ml, 4 ml and 10 ml 11. Elution collection vials 2 ml, 4 ml and 10 ml 12. SPE cartridge drying for complete solvent change 13. Evaporative concentration of the eluate, with or without adding keeper solvent
Solvent Evaporation module	It should be configured as module on x-y movement head line/rail/platform of Main Unit. It must be multi-position evaporation station to performs solvent evaporation and sample concentration. Samples in standard vials can be evaporated /concentrated Controlled evaporation through user defined 1. temperature (ambient to 100^{o}C), 2. agitation (from 300 to 700 rpm) and 3. defined vacuum (up to 60 mbar) levels with vacuum pump and condense enabling to flexible operation. Evaporation simultaneous 6 samples or more Evaporation vial / tube capacity 10 ml vial (8ml volume), 4ml vial (3ml volume), 2 ml vial (1.2 ml volume)
Software	System license software to control and programming all function and device/module under one software.

	Software should be able to operate independently and should able to control and functions. Software should have sample preparation Builder function for Solid Phase Extraction, Washing, Evaporation Software should have built-in maintenance function, simplifying maintenance planning and improving the overall operation
Data processor	Windows based workstation with latest configuration: Monitor-20" or large display LCD based monitor with 4K-UHD resolution for software installation and instrument operation, data storage and analysis Should be along with latest licensed Window OS and other necessary software.
Accessories	Syringes 1000 µl compatible to system 5 no Syringes 10 ml compatible to system 5 nos Tray for 50 vials of 2ml 3 nos Sample Tray for 60 vials of 10 ml and 20 ml or 30 ml each 3 nos QuECheRS Cartridges for Food • Matrices with high fat (500 No.) • Matrices with high Water content and (500 No.) • Matrices with high pigmented (500 No.) Tubing, adaptors, frits, joints, and any replaceable item for operation of system 5 sets
Power requirements	230 V / 50 Hz – 230V/60Hz
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Performance certificate	From at least two institution where same model has been installed in the previous 2 years
Warranty	2-year after satisfactory installation and working excluding consumable parts and accessories.
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Training	The supplier should provide comprehensive training to users on operation of the instrument and application support onsite as per specifications

List of Spares and Accessories	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
UPS	Suitable rating UPS (60 min back-up)
Quality Requirement	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
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument.
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

31.MICROPIPETTES

Application: Micropipettes are used to measure and deliver accurate volumes of liquid in any analytical measurement. These devices measure small volume, starting at 1 microliter, and are used in various laboratories, including food analytical laboratories				
Specifications	**Requirement**			
General	Liquid handling equipment, Autoclavable with high precision, robust and reliable			
Material of construction	Corrosion resistant piston and sealing material to allow smooth and uniform pipetting			
Pipette Tip Cone	Pipette tip cone should be universal type suitable for any make of microtips. Pipette tip cone should be removable for easy cleaning, maintenance and autoclaving.			
Operation	Effortless single hand operation of volume setting, volume lock, pipetting and tip ejection, all operations with the same hand			
Display	Should have 4-position display with an integrated lens for better display. Display always visible and facing the user.			
Sterilization	Completely autoclavable at 121 °C, 20 mins without disassembly			
Volume Range and Quantity specified	Range	Quantity	Maximum permissible Systemic error (at 100% volume)	Maximum permissible Random error (at 100% volume)
	0.5-10 µL	2	± 1%	± 0.04%
	10-100 µL	2	± 0.8 %	± 0.2%
	100-1000 µL	4	± 0.6 %	± 0.2%
	2-20 µL	2	±1%	± 0.3%
	20-200 µL	4	±0.6 %	± 0.2%
	5-50 µL	4	±0.8 %	± 0.35%
	10-500 µL	4	±0.6 %	± 0.2%
Identification	Each pipette must have a individual identification number engraved and also have an individual labelling area.			
Accessories	1. Suitable Tips for all pipettes, Tip boxes 2. Rotatable holder with Large rubber feet protection from liquids spilled on bench top to hold and for storing up to 6 pipettes in upright position: 4 Nos			
Calibration	3-point calibration certificate with Uncertainty measurement from ISO 17025 (NABL) accredited lab			
Manual	Each pipette should be accompanied with a manual and have pictorial representation of all operations, limitations and functions			
Certification				
Warranty	2 years			
Service	Should provide annual service and calibration			
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and			

	giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

32.ELECTROMAGNETIC SIEVE SHAKER

Application: Traditional sieve analysis is the standard for production and quality control of powders and homogeneity for reproducible results. To guarantee a high degree of reproducibility and reliability, sieve shakers with sieves of known mesh size are used.	
Specifications	**Requirements**
General	Sieve shaker with a maintenance-free electromagnetic drive for dry or wet sieving for test sieves 75µm, 125 µm, 150 µm, , 250µm, 300µm, and 500µm, along with assembly lid and receiver with 3D sieving effect and extremely smooth and quiet operation, short sieving times and high separation efficiency.
Design	Electromagnetic drive with 3D- sieving effect
Mode of Operation	Continuous and Intermittent
Number of sieves	Up to 8 sieves of 50 mm height
Shake Time	Programmable from 1min to 99 min
Noise Level	Less than 60 dB without sieves at maximum amplitude, Less than 70 dB with sieves and material at maximum amplitude.
Sieves	• Made from SS 316 with laser marking of specification & serial no • Assembly lid and receiver should be of SS-316 material • Specially designed sieves without crevices to avoid trapping of sieving material and without Lead • Mesh is uniformly tensioned, welded and no soldering process involved. • Should have sturdy jointless rims for excellent fitment. • Supplier should provide the calibration certificate for each sieve • Should be manufactured in accordance with ISO 3310:1-2000 standards.
Display	16 x 2, character alphanumeric LCD
Net Weight	50 Kg without Sieves (Approx)
Calibration standards	Calibration certificate for mesh size of each sieve from ISO17025 accredited laboratory to be provided
Power requirements	230 V / 50 Hz – 230V/60Hz
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs would be adequately displayed
Performance certificate	From at least two institution where same model has been installed in the previous 2 years
Warranty	2-year after satisfactory installation and working excluding consumable parts and accessories.
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number;

	Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Training	The supplier should provide comprehensive training to users on operation of the instrument and application support onsite as per specifications
List of Spares and Accessories	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
UPS	Suitable rating UPS/stabilizer (30 min back-up)
Quality Requirement	Calibration certificate from ISO17025 accredited laboratory. Should be FDA/CE/BIS approved product. Manufacturer and Supplier should have ISO 13485. 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
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument.
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

33.BENCH TOP OIL BATH

Application: An **oil-bath is a** heated bath used in a laboratory where the heating medium is oil in place of water. These baths are used to heat more evenly than would be possible with a hot plate alone and are used at very high temperatures

Note: ***Overheating the oil bath can result in a fire hazard, especially if mineral oil is being used. Generally, the maximum safe operating temperature of an oil bath is approximately the oil's flash point.***

Hot oil can cause severe skin burns

The oil/liquid to be used should have flash point higher than operating temperature

Requirement	**Specification**
Capacity	2 litres
Temperature Range	Ambient +10 °C to 300 °C
Temperature Accuracy	±1.0 °C
Temperature uniformity	±3.0 °C.
Controller and display	Digital PID controller and display should be LED.
Timer	5 min-2h
Material of construction	Double walled, internal and external chamber full stainless-steel construction, insulated handles on sides, oven baked epoxy finished external body, industrial grade long life special heaters for efficient transfer of heat
Lid	The lid should be provided with sensor inserting port holes, thermometer insert hole
Insulation material	Ceramic fiber with thickness of 45-50 mm
Heater	500 W approx.
Sensor	Should be Pt 100 (RTD)- 3 wire.
Audio alarm	Deviation High or Low Overshoot alarm End of cycle
Cooling system	Fin and tube air cooled condenser. The oil-bath should have cooling coil for circulation of chilled water
Readout	Actual and set point.
Drainage	Must have drainage facility
Safety control	Floating overshoot alarm set 10 °C above set point, absolute over temperature alarm-audio-with auto cut off, end cycle visual indication with heater cut off.
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. • 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
Operating manuals, service manuals, other manuals	Should provide • User, technical and maintenance manuals in English language

	• List of equipment and procedures required for local calibration and routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation, if any.
Recommendations or Warnings	Any warning signs should be adequately displayed
Warranty	Warranted for 2-year, extendable up to 3 years, after satisfactory installation and working excluding consumable parts and accessories.
Service Support	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer
Training	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
Stabiliser	Suitable stabiliser to support the instrument.
Quality Requirement	• Product certification: CE / FDA / BIS certified. • Manufacturer and Supplier should have ISO 13485 certification. • Should provide calibration certificates from NABL accredited agency every year during warranty & CMC period. Calibration cost will have to be borne by the supplier. • 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 • GLP-validated software for controlling the system
IQ/PQ/OQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument
After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance

	that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration

34.BOTTLE-TOP DISPENSER

<table>
<tr><td colspan="6">Application: Bottle-top dispensers are used for safe dispensing of different volumes of concentrated acids and corrosive chemicals from a bottle safely and reliably, without contamination from the reagent bottles for use in laboratory</td></tr>
<tr><td>Requirement</td><td colspan="5">Specification</td></tr>
<tr><td>General</td><td colspan="5">For free dispensing of concentrated acids such as
HNO_3, HCl, HF, H_2SO_4, and liquid H2O2
Simple single-hand usage</td></tr>
<tr><td>Material</td><td colspan="5">Metal-free construction
Corrosion resistant components for high concentrated acids (also HF)
Reproducibility for base solutions</td></tr>
<tr><td rowspan="4">Types of bottle dispenser</td><td>Type
Analog, variable volume</td><td>Range of volume to be dispensed (mL)</td><td>Volume increment (mL</td><td>Accuracy
Full scale</td><td></td></tr>
<tr><td>1-10 mL</td><td>1-10 mL</td><td>0.25 or less</td><td>$\leq \pm 0.5\%$</td><td></td></tr>
<tr><td>10-50 mL</td><td>10-50 mL</td><td>1.0 or less</td><td>$\leq \pm 0.5\%$</td><td></td></tr>
<tr><td>50-100 mL</td><td>50-100 mL</td><td>1.0 or less</td><td>$\leq \pm 0.5\%$</td><td></td></tr>
<tr><td>Safety features</td><td colspan="5">Dispenser should have recirculation valve to ensure safety during dispensing.
The end of the discharge tube should have a hinged cap to avoid dripping after dispensing.</td></tr>
<tr><td>Working temperature range</td><td colspan="5">Dispensers should be suitable to work in 20-40 °C temperature range.</td></tr>
<tr><td>Calibration certificate</td><td colspan="5">Calibration certificate from ISO 17025 Laboratory according to ISO 8655 standards.</td></tr>
<tr><td>Accessories</td><td colspan="5">• A calibration tool for in-lab recalibration
• Adapters that comfortably fit most laboratory reagent bottles (28 mm, 32 mm, 38 mm, 40 mm and 45 mm).
• Heavy Duty Acid resistant gloves</td></tr>
<tr><td>Quality Requirement</td><td colspan="5">• Product certification: CE / FDA / BIS certified.
• Manufacturer and Supplier should have ISO 13485 certification.
• Should provide calibration certificates from NABL accredited agency every year during warranty & CMC period. Calibration cost will have to be borne by the supplier.</td></tr>
<tr><td>Warranty</td><td colspan="5">Warranted for 2-year, extendable up to 3 years, after satisfactory installation and working excluding consumable parts and accessories.</td></tr>
<tr><td>Service Support</td><td colspan="5">Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number;
Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer</td></tr>
<tr><td>Training</td><td colspan="5">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</td></tr>
</table>

After sales service/ Post warranty	Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number; Should have a good after sales service/technical support capable of reaching at short notice the places where instrument is installed. Visits and unlimited breakdown calls by service/application support, engineers should attend immediately without fail. Should carry out yearly PM with at least one PM kit Comprehensive AMC cost/rate for 3 years after warranty shall be quoted. Terms and conditions for the comprehensive AMC, after the warranty period has to be specified
Compliance statement	The quote should also include a compliance statement vis-à-vis specifications in a "tabular form" clearly stating the compliance and giving justification, if any supported by technical literature. This statement must be signed, with the company seal, for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification.
Payment	Payment only after installation, validation and performance demonstration