TECHNICAL SPECIFICATIONS OF EQUIPMENT FOR MODEL BASIC FOOD TESTING LABORATORY

FOOD SAFETY AND STANDARDS AUTHORITY OF INDIA

Inspiring Trust, Assuring Safe & Nutritious Food

Ministry of Health and Family Welfare, Government of India

SUMMARY

Food safety is a major concern among consumers and it starts with testing of a variety of food products in a laboratory. Food testing is applicable to both safety and quality, and quality control in food manufacturing. Food testing laboratories deploying a comprehensive range of state-of- the-art analytical techniques are a necessary and vital arm of a responsible and responsive food regulatory system, important for robust implementation and enforcement. If food laboratory services are to effectively support regulatory surveillance and monitoring, they need to provide reliable, valid and timely results. The efficient and effective procurement of laboratory items critically impacts the quality of all laboratory services. Therefore, high-quality equipment and reliable supplies are essential. The key driver for the food analyst is to decide on equipment appropriate for the analysis to meet regulatory compliance. Providing essential equipment in laboratories is a critical component of strengthening the food testing infrastructure. Rapidly changing technologies, complexities associated with the various equipment central to food testing, high costs in procurement render the selection of the appropriate and cost-effective equipment a challenging task. Having well deliberated and thought of specifications for all the basic laboratory equipment in one document would reduce the procurement cost and time and extensively improve the efficiency of procurement. A good technical specification for an instrument will not only give the suppliers, an opportunity to provide their best offer, but will also include any requirements that must be met in order to be 'fit for purpose'. The purpose of this document is to provide technical specifications to facilitate State Food Testing Laboratories and others responsible for the procurement, logistics and management of laboratory equipment. The document will be useful in developing systems for the efficient and timely procurement of quality laboratory equipment.

When selecting equipment for purchase, laboratories need to take into account:

1. The proposed use of the equipment;
2. How well the equipment accords with the service provided;
3. Performance characteristics;
4. Facility and infrastructural requirements;
5. Cost;
6. Availability of reagents and consumables, and arrangements for supply of these materials;
7. Ease of operation;
8. Warranty;
9. Availability of technical support from the manufacturer;
10. Service contracts;
11. Location available space and accessibility in the laboratory;
12. Safety

Considering all of the above points, the specifications of key equipment used in a food testing laboratory to meet and comply with the Food Safety and Standards Rules and Regulations (2011) have been compiled. Although the technical specifications are suggestive and kept generic in nature, the technical appropriateness has been the cornerstone of this exercise. These specifications are the minimum as required to meet the requirement as per the FSS Rules and Regulations 2011. For any special and specific requirement for higher sensitivity /application the technical specifications may be modified to meet the same.

The technical specifications are divided in to three parts. Part A lists all the primary analytical instruments. Part B lists the special equipment required for microbiological analysis. Part C lists all the auxiliary equipment that supports physical, chemical, and microbiological analysis.

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 for Testing and Calibration Laboratories
NPL	National Physical Laboratory
NMI	National Institute of Meteorology
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	
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 and 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	0.00001 g (.01mg)
Readability	0.01mg (0.00001 gm) or 0.1 mg (0.0001 gm) Lab can choose the readability required
Repeatability (Standard deviation)	±0.1 mg
Linearity	±0.2 mg or better
Response time	Less than 10 sec
Stabilization (typical and fast)	Approx. 4.0 sec (0.1mg) / 15 sec (0.01mg)
Weighing pan	a) Circular/square/rectangular 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. Material: special steel, non-magnetizable, density 8.0 g/cm^3, 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 between -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 years after satisfactory installation and working excluding consumable parts and accessories.
Training	The supplier must 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 the 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 compliant with the requirements of FDA/CE/BIS 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 of 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 years 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 compliant with the requirements of FDA/CE/BIS 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. 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, with dedicated Auto samplers for GTA and Flame with 100 or more vial positions.
Wave length range	185-900 nm or better
Sensitivity	At least 0.9 A for 5µg/ml aqueous copper standard solution with air – acetylene flame

Optics	• Dual Beam dual-blazed / holographic Czerny turner Monochromator or equivalent
	  • Focal length: at least 250 mm focal length
	  • Resolution: 1800 lines / mm
	  • Width: Automatic bandwidth of 0.2 to 1.0 nm

Flame Atomizer	• All coded titanium or equivalent burner with impact bead / Flow spoiler, premix Design • Movement: Permanently aligned or Automatic movement into the sample compartment • Affect from Acids /Organic solvent: Unaffected from attacks by acid solution or organic solvents • Flame Alignment in liquid beam Fully automatic, optimized with motorized burner mount for vertical and/or 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.
Flame and Gas Controls	Flame Control: Fully Computer controlled ignition/3 stage safety control ignition. Gas Control: Fully 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/ Boosted Hollow Cathode lamps/ Super Lamps/ Ultra Lamps and Electrode – less discharge lamps or equivalent, integrated RFID tool or provision for Lamps recognition, Time of operation, Operation Current etc
Autosamplers	Dedicated & Permanently aligned Auto sampler for GTA, Dedicated Auto sampler for Flame and VGA Units with 100 or more vial positions each. Should have Sample rack for vials & supplied with two sets of sample vials
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 3 to 50 seconds range
Measurement	Measurements of mean, RSD and CV, Background only mode, Integration of peak height and peak areas
Accessories/ Spares	All accessories with Flame AA System
Vapour Generation Assembly:	Should be continuous flow-based hydride / mercury vapour generator to be used with a programmable auto sampler
Precision	Better than or at least 1% at ppb levels of mercury, arsenic etc.
Mercury amalgamation	Mercury amalgamation unit
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, if applicable 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	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. All lamps should be coded lamps only. Non coded lamps will not be acceptable. 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. Transformer if necessary 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 and Argon Gas regulator	Nitrogen and Argon regulator (two stage) with necessary tubing 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/wall atomization. The system should also be equipped with an integrated graphite furnace camera for easy autosampler tip alignment and real time viewing of the process happening in graphite furnace.
Background correction technology	The system should be fitted with D2 background correction for flame technique and Zeeman background correction for furnace technique.
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
Temperature Range	Temperature range ambient to 2600°C or more in 10°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 8-10 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 onscreen
Memory:	Memory should be able to store at least ten nonvolatile Programs
Cooling Water Re-circulation Unit	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 100 ml, 1000 ppm from NIST one each 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 5000 analyses for each of the following units for each of the following units: Flame AAS (basic unit, burner system) Vapor generation assembly Graphite Furnace Atomizer and Auto samplers
Supplier/ Manufacturer	• Must be ISO certified for quality
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 years 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 compliant with the requirements of FDA/CE/BIS Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements (or equivalent BIS Standard) Electrical Safety conforms to EN 61010-1:2016/61101-1/IEC61010-2-40 Should have necessary certification for safety and quality standards from national/ international bodies Electromagnetic compatibility as per 61326-1:2013
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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: (i) Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. (ii) Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. (b) Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. (c) Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. (d) Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system.
Payment	Payment only after installation, validation and performance demonstration

4. AUTOMATIC FIBRE ANALYZER

Application: It is used for analysis of 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	Should have possibility of analyzing 6/12/24 samples at a time
Sample size	≤ 1 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	2 years 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 compliant with the requirements of FDA/CE/BIS 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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a

	serviceable condition to avoid complete breakdown of the equipment/system.
Payment	Payment only after installation, validation and performance demonstration

5. AUTOMATIC 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	≥75%
Temperature	100°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 • User interface for upgradation of software • 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 The material of construction of equipment should be Epoxy painted stainless-steel structure to prevent corrosion or other corrosion free 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	2 years after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least) or CAMC
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 compliant with the requirements of FDA/CE/BIS 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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the

	year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system.
Payment	Payment only after installation, validation and performance demonstration

6. AUTOMATIC 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 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. Cleaning shall include condensation, neutralization, adsorption and redox reactions to maintain efficiency of the equipment 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. Automatic waste removal via tube drainage after distillation 11. 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 or connectivity for LIMS 12. Additionally, it should be possible for transferring weights and retrieving data using suitable software which is compliant to traceability. 13. The system should have safety sensors and audible warning systems 14. Should be provided with exchangeable splash head to reduce carry-over effects 15. The system should be provided with suitable password protection to prevent tampering of programmes and data. 16. The system must be compliant to ISO 17025:2017 17. 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. 18. The instrument shall be delivered with a Verification Test document that certifies that instrument has been performance tested in factory (confirming analysis performance). 19. The systems should be supplied with Kjeltabs (5000 nos.) or equivalent, 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	Should be compliant with the requirements of FDA/CE/BIS

Requirement	• 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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system.
Payment	Payment only after installation, validation and performance demonstration

7.BOMB CALORIMETER	
Bomb calorimeter is required to calculate the total energy value of the food products	
Specifications	**Requirement**
Instrument	Fully Automatic Bomb Calorimeter for rapid determination of Gross Calorific Value of food items.
Temperature resolution	0.0001^0C or Better
Reproducibility/Repeatability	<0.1% RSD or better
Unit of measurement	CAL and KJ
Memory	1000 test or Higher
Pelletizer	Suitable for pelletizing food samples.
Sample weight	0.5 to 1.0 g, or better
Calories Energy Measurement Range	25 – 10000 Calories or more
Jacket Type	Isoperibol, water jacket
Bomb Type	Removal bomb and bucket type
Bomb standards	Comply with ISI350 / ASTM E144
Network Interface	Suitable interfaces for PC, Printer & Balance with USB type port.
Oxygen filling	Automatic
Calculation	Provision for correction facilities due to moisture Fibre, spike weight, Ash for further calculation of Gross Calorific Value.
Calibration Standards	Certified values of Certified Reference Materials (CRM) provided by an accredited Reference Material Producer with stated metrological traceability to the SI
Oxygen cylinder	Oxygen Cylinder 2 nos Cylinder regulator with adapter for filling the bomb – 1 no
Accessories	Ignition wire – Additional 10 Nos Cotton thread – 1000 Pcs Combustion crucible – 25 Pcs Bomb – Additional 3 nos NIST certified Benzoic for calibration Any other accessories required for analysis of food samples.
Training	The supplier shall provide on – site comprehensive training for scientific personnel operating the system and support services with the system.
Warranty	• Minimum 2 years warranty should be provided starting from date of satisfactory and faultless functioning of the equipment at the respective laboratory premises. • Comprehensive Maintenance Contract (CMC) Service for 3 years, after expiry of standard Warranty should be quoted. • Annual calibration of the equipment shall be a part of the CMC. It shall also be mandatory to perform calibration after every major repair/breakdown.

Operating manuals, service manuals, other manuals	Should provide 2 sets (hardcopy and soft-copy) of: • User, technical and maintenance manuals to be supplied in English language along with machine diagrams; • List of equipment and procedures required for local calibration and routine maintenance; • Service and operation manuals (original and copy) to be provided; • Advanced maintenance tasks documentation; • Certificate of calibration and inspection
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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional check-ups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system
Payment	Payment only after installation, validation and performance demonstration

8. 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	Calibration by certified reference material traceable to SI units or ISO 17034.
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	• Certified values of Certified Reference Materials (CRM) provided by an accredited Reference Material Producer with stated metrological traceability to the SI • 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 2 years for electrode extendable up to 3 years 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 compliant with the requirements of FDA/CE/BIS 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

9. 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 1.2800－1.7000
Automatic Temperature Control	Through Peltier
Concentration	0 - 80%
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 ± 0.0001
Measurement Temperature	10˚C to 65˚C or better
Temperature Accuracy	±0.1˚C
Ambient Temperature Sample	10 to 40˚C
Response Time	≤5 sec
Sample Volume	≤2 ml
Certified Reference Materials	Refractive Index Certified Reference Materials (CRMs) Certified reference material used for calibration and verification for refractive index at 25^{O}C. (minimum volume 25 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	Warranty for 2-years, extendable by 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 compliant with the requirements of FDA/CE/BIS 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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system.

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10. 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. Automatic movement of head for closing and opening of the cup Microprocessor controlled unit with digital easy to read display of the results
Ignition	Electric ignition and should also provide an automatic reignition facility Electric Ignitor should be encapsulated
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	Warranty for 2 years, extendable by 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 compliant with the requirements of FDA/CE/BIS 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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any

	breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system
Payment	Payment only after installation, validation and performance demonstration

11. 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 L/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 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
Stabiliser	Suitable Stabilizer as required for functioning of the equipment

Quality Requirement	Should be compliant with the requirements of FDA/CE/BIS • 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	
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	
Note: The laboratories can choose from among the three detectors described based on the analytical application. It is not binding that all the detectors must be obtained.	
Requirements	**Specifications**
System	Gas chromatograph with capability of operating concurrently with two injectors and two detectors or better. 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 50 ^{o}C/min ramps 8 or more • Cool-down time from 450 ^{o}C to 50^{o}C within 5 minutes or better • Should be able to accommodate two or more injectors and two or more detectors • Automatic leak test of system
Pneumatic Controls	0-100 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 ≥2ramps or better. • Multimode/PTV/ PSSI with 150 µL or better Injection Volume capability with complete solvent vaporizer system or Equivalent. • Injector must be able to operate with capillary & wide bore columns • System should have back-flushing capability.
Auto sampler (Liquid)	• Robust Liquid auto sampler capable of injecting ≥100 samples or better with syringe • Must allow installation and automation of suitable syringe featuring volumes from 0.1 to 50 µL or more. • Must be able to achieve combined multiple solvent rinsing with up to 4 different solvents.
Head space auto sampler	With a capacity ≥35 vials or better that support 10/20/22/ml or better vial capacity with Pneumatic control • Incubation Oven Temperature Range 50 to 200 °C in 1 °C steps • Syringe/needle or Valve & Loop Temperature 50 °C to 150 °C in 1 °C steps • Incubation Oven Capacity of 6 -12 vials or better. • Headspace sampler should have an RSD < 2%.
Detectors	• The GC must have complete integrated control of all parameters (no external control module) for respective detectors: FID/ ECD/ 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/without makeup gases: 1.5 pg C/sec or <3 pg C/sec or better with Octane. • Operating temperature limits: 450°C with standard ceramic/quartz flame jet or equivalent 28 • 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 or < 0.05 pg perchloroethylene. • 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. Hydrogen & Zero Air
Software and Hardware (Single Point Control Of Software & Hardware)	
Software	Complete system and software configuration must be 21 CFR Part 11 compliant. Software: Windows Based software with multitasking and capability.
	Software update up to 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.
Application Support	The Application support for stated applications required during method development and validations.
Pre-Installation Requirements (PIR)	Provide all PIR of the system.
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	• Provide all Suitable injector liners required for the system quoted (20 No.)
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	Suitable syringes for quoted autosampler (4 Nos) Suitable Headspace syringe /valve/loop (4 Nos)
Sample Preparation *(Water & Food)*	QuEChERS Kits for Pesticides and Herbicides in following Matrices: • Matrices with high fat (1000 No.) • Matrices with high Water content and (1000 No.) • Matrices with high pigmented (1000 No.) • SPE cartridges for water (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	Certified values of Certified Reference Materials (CRM) provided by an accredited Reference Material Producer with stated metrological traceability to the SI for all Fatty Acids including Trans fatty acids, Cholesterol, plant sterols
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	Warranty 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	Should be compliant with the requirements of FDA/CE/BIS 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. 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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system
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) is 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 2.5 µm particles and any other column chemistry

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	8500 psi or better
Flow Rate Range:	Programmable 0.01 to 2 ml/ min in 0.01 ml/min increments
Flow Precision	±0.1% RSD or below
Flow Rate Accuracy	±1%
Delay Volume	< 1100 µl
Eluent Degassing	Online membrane Degasser for all channels
Gradient Mixer	1. Quaternary mixing & gradient capability using suitable proportionate valve) 2. Plunger Seal Wash Integral/ 3. Gradient Profiles which include gradient curves: linear, step, concave, and convex 4. Composition Precision 0.20% 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	190-750 nm with inbuilt Holmium oxide filter
Spectral resolution	1.2 nm or better per photodiode with a Total of 1024 photodiodes, digital and optical (3D modes)
Bandwidth	<5 nm or better
Linearity range	<5% at 2 AU, 257 nm
Baseline noise	8.0 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	
RI DETECTOR	
Refractive Index Range	1.00 to 1.75 RIU
Noise Level	± 2.5 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 25 ºC to 50ºC.
Fluorescence Detector	
Light Source	Continuous Xenon lamp
Excitation Wavelength	Range 200-850 nm

Emission Wavelength	Range 220-900 nm
Spectral bandwidth	15-20 nm both in the excitation and emission sides
Wavelength accuracy	should be +/- 2 nm
Repeatability	should be $\pm$ 0.2nm
Sensitivity	should be S/N > 1000 (Raman Spectrum of H_2O) as per ASTM Method
Data Acquisition range	should be up to 80 HZ Cell volume should be < 2 microliter
Pressure	limit up to 500 psi
Column Oven with preheating capability	
Temperature range	10 to 90° C
For column length	Must accommodate upto 300 mm columns
No of Columns accommodated	Minimum 1
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	0.1-100 µl (Standard)
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
Tray Temperature Operating Range	4 - 40 º C or more with ±0.5 ºC accuracy
Accessories	
HPLC Columns	One each of C8 = 250 × 4.6 × 5µm C18 = 250 × 4.6 × 5µm Cyano = 250 × 4.6 ×5µm. Amino = 250 × 4.6 × 5µm Phenyl = 250 × 4.6 ×5µm. Silica = 250 × 4.6 × 5µm . 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	Warranty for 2 years, 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 min
Quality Requirement	Should be compliant with the requirements of FDA/CE/BIS • 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.

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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system
Payment	Payment only after installation, validation and performance demonstration

14.LOVIBOND TINTOMETER	
Application: It is a visual and automated color 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	2 years 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 compliant with the requirements of FDA/CE/BIS

	• 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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of

	the equipment/system
Payment	Payment only after installation, validation and performance demonstration

15. 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 • Bspectrophotometeruffer 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 • Standard buffer solution (pH 4.0, 7.0, 9.0 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	• 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
Warranty	2 years after satisfactory installation and working excluding consumable parts and accessories. Provision should be there to extend the warranty up to 3 years (at least)
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. 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, Certified values of Certified Reference Materials (CRM) provided by an accredited Reference Material Producer with stated metrological traceability to the SI And dust cover at the time of supply
UPS	UPS/Stabilizer as required for functioning of the equipment

Quality Requirement	Should be compliant with the requirements of FDA/CE/BIS • 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. UV-VISIBLE SPECTROPHOTOMETER	
Application UV-VIS spectrophotometer is the workhorse of the laboratory used in spectrophotometric and colorimetric analysis of analytes, food colors, enzyme assay, hydroxymethyl furfural, coloring and bitter principles of saffron etc.	
Specifications	**Requirement**
System	A fully automated PC Controlled 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 **from PC key board** 3. Capable to store method with analysis:> 100 method programs on the instrument or PC > 1000 results with data, evaluation results and used parameters
Optical Design	• Double Beam with sample and reference cuvette positions; Czerny-Turner equivalent Monochromatic /Holographic OR equivalent 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	185 –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 (0.2/0.5/1/2/4 or 5) nm
Photometric Range	Absorbance = -3.0 to 3.0 Abs or better.
Photometric Accuracy	With Neutral Glass filter @ 546nm : ± 0.003A
Stray Light	Max. 0.05% (220 nm NaI) or better, Max. 0.05% (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 • Suitable Certified Standards for Validation including Holmium oxide glass filters for wavelength calibration & NIST traceable NIST traceable • 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. Wavelength check and absorbance check for the calibration of equipment should be performed
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. • Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements (or equivalent BIS Standard)
Quality requirement	Should be compliant with the requirements of FDA/CE/BIS • 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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system
Payment	Payment only after installation, validation and performance demonstration

18. 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 thermostatted 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 years 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 compliant with the requirements of FDA/CE/BIS • 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.

Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also, unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system
Payment	Payment only after installation, validation and performance demonstration

19. 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 L)
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: - r• 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 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 compliant with the requirements of FDA/CE/BIS • 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
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time.

	Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system
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

20. KARL FISCHER TITRATOR

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/external 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	1.0 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	1.0 mg H_2O/minute or better
Maximum Electrolysis Current	100 mA or better (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
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 compliant with the requirements of FDA/CE/BIS 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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per

	year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system
Payment	Payment only after installation, validation and performance demonstration

21. 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 argentometric / 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	± 2000 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 inbuilt magnetic stirrer which prevent vortex formation and enables better mixing for fast response of electrode
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 compliant with the requirements of FDA/CE/BIS 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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system
Payment	Payment only after installation, validation and performance demonstration

22. 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 years 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 compliant with the requirements of FDA/CE/BIS 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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system
Payment	Payment only after installation, validation and performance demonstration

23. ABBE'S DIGITAL REFRACTOMETER

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 Institutions, 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 compliant with the requirements of FDA/CE/BIS 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.

Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system
Payment	Payment only after installation, validation and performance demonstration

24. AUTOMATIC DIGITAL POLARIMETER

Application: It is used for measuring the concentration of sucrose in juices and jaggery and the purity of these products. All sugars are optically active, and therefore, their concentration can be conveniently measured by means of the polarimeter

Specifications	**Requirements**
Measuring Mode	Optical Rotation, Specific Rotation, Specific Rotation Plus Concentration, Sugar Scale °Z(ISS)
Display	On screen LCD / LED (touchscreen) and / or on personal computer via USB ports (if operating on PC, PC requirement should be mentioned). Touch-screen will be preferred
Accuracy	0.001 deg Arc or better
Reproducibility	0.001 deg Arc optical rotation
Resolution	0.001 deg Arc optical rotation, 0.001% concentration, 0.001 specific rotation
Measuring Range	± 89.9 deg Arc Optical Rotation, ± 999.99° Arc Specific Rotation, 0-99.9% Concentration
Optical Wavelength	589 nm Na and Tungsten-halogen or Hg- Lamp (for 633 mm / 578 mm / 546 mm / 436 mm / 405 mm
Light Source	Sodium/Tungsten-halogen/LED with life time 100,000 h of operation
Prism	Glan Thompson Calcite prism with life time Guarantee
Detector	PMT
Aperture	Should be variable for low concentration measurements
Temperature Control	With In-built Peltier module; Temperature Range 15 °C to 40 °C; Temperature Accuracy: ±0. 1 °C
Calibration Automatic	Calibration In-built via touchscreen.
Calibration Standards	Certified values of Certified Reference Materials (CRM) provided by an accredited Reference Material Producer with stated metrological traceability to the SI for sugar solutions
Response speed	Approx. ±6° / sec
Measurement time	5 Measurements in less than 25 sec Avg.
Sample Compartment	Accept sample tubes up to 200 mm
Compliance	Full GMP/GLP and 21 CFR Part 11; Audit trail
Data memory	>2 GB
Interfaces:	Min. 4 USB ports, RS 232 standard or later standard, Ethernet, VGA port, CAN bus. Instrument should be compatible with common brands of PC, Keyboard, Printer and memory stick/external hard drives.
Sample cells	Two Sample cells having pyrex glass with stopper. Sample Length Sample Volume 1. 100 mm 1.5 ml 2. 200 mm 2.0 mL
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 Institutions, where same model has been installed in the previous 2 years
Warranty	2 years 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	Should be compliant with the requirements of FDA/CE/BIS 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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should

	not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system
Payment	Payment only after installation, validation and performance demonstration

25.VISCOMETER	
Application: Rotary Viscometer is required to measure the dynamic viscosity, kinematic viscosity and density of food samples such as beverages, sauces juices, syrup and milk etc.	
Specifications	**Required**
Display type	Built-in-Display
Measuring range for dynamic viscosity	0.2 to 30000 mPas
Measuring range for kinematic viscosity	0.2 to 30000 mm^2/s
Measuring range for density	0.65 to 2.5 gm/cm3
Display Resolution	Viscosity: 4 significant digits or better Density: 0.001 gm/cm3 or better Thermostat: 0.01^0C or better
Accuracy	Viscosity: 0.5% of measured value or better Density: 0.01 gm/cm3 or better Repeatability $\pm 0.01^0C$ or better
Standards	NIST traceable Viscosity and Density 4 no's each at various temperatures
Control system	Interfaces: 4 x USB, 1 Ethernet 1 x CA Bus, 1 x RS-232, 1 x VGA
Data memory	Inbuilt data memory for 1000 measurements or more.
Spindle /Speed combination	18 or more
Training	The supplier shall provide on – site comprehensive training for scientific personnel operating the system and support services with the system.
Warranty	• Minimum 2 years warranty should be provided starting from date of satisfactory and faultless functioning of the equipment at the respective laboratory premises. • Comprehensive Maintenance contract (CMC) Service for 3 years, after expiry of standard Warranty should be quoted. • Annual calibration of the equipment shall be a part of the CMC. It shall also be mandatory to perform calibration after every major repair/breakdown.
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	Should be compliant with the requirements of FDA/CE/BIS 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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also, unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system
Payment	Payment only after installation, validation and performance Demonstration

PART B: EQUIPMENT FOR MICROBIOLOGY LAB

1. LAMINAR AIR FLOW (HORIZONTAL)

Application: A Laminar flow hood/cabinet is an enclosed workstation that is used to create a contamination-free work environment through filters to capture all the particles entering the cabinet. These cabinets are designed to protect the work from the environment and are most useful for the aseptic distribution of specific media and plate pouring. Only the sample is
protected and not the user.

Specifications	Requirement
Working principle	• The LAMINAR AIRFLOW UV Chamber when switched on, the blower unit should create a suction pressure through the primary filter (or Pre-filter), which removes dust particles of above 10- micron size in the first stage. Subsequently, the filtered air passed to the HEPA filters, where the particles or substances of 0.3- micron size and above are removed. Finally, the ultra-clean filtered air supplied to the working chamber as a uniform airflow to perform precision analysis activities
Cabinet (Material of construction)	The system should have • Laminar Air Flow Cabinet should have fully enclosed bench designed. • The Laminar flow bench should have Stainless Steel SS 304 table with MS coated tabular frame and body. • Laminated Unit should also have stand by control system with lock and key.
Unit	The unit should have • Should have LCD display to show measured parameters like stage velocity, total using time, UV/FL lamp on/off, etc • Unit should have Differential pressure indicator.
Cleanliness level	The system should have • CLASS 100 (ISO 5 for particle sizes 0.5 µ < 3530 particles/M³ of air at both at Rest & Operation Condition as per ISO 14644 –1
Working area	Minimum 4 ft (w)x 2 ft (h) x 2ft
Work table	• It should have SS 304 grade Stainless Steel with finish 4 polish surface Front door • 5 mm thick clear Acrylic Sheet - Vertical sliding
Floor standing Base stand for cabinet	• Have leveling feet or locking casters or motorized height adjustment.
Direction of flow	• Vertical airflow
Airflow Speed	• Filter face Velocity should have 90 Feet/Minute ± 20 (0.45 m/s)
Blower Assembly	• It should have one set blower system, which consists of dynamically & statically balanced aluminium centrifugal impeller driven by 1/4 HP, single phase,1200- 1400RPM motor, enclosed in an PU coated GI casing suitably suspended in a pair springs & connected to the filter chamber through flexible canvas duct

HEPA Filters	The filters should have • Size: 30” x 18” x 3” • Type: Separator less type, Mini-Pleats HEPA Media • Media: Ultra clean glass fiber paper
	• Retention: 0.3 Micron • Efficiency: 99.997% or better • Initial Pressure: 16 mm WG • Grade: H13 rating
Pre-Filters	• Size: 600 x 300 x 65 mm • Media: Synthetic, non-woven polyester • Casing: Epoxy painted GI frame • Retention: 10 Micron & above • Efficiency: 90% • Initial Pressure: 6 mm WG • Grade: F7 rating
Particle Retention	• 0.3 Micron
Noise level	< 60 dBA±5
Power Supply	• Power supply should have 220-230 V, 50 Hz. And all components UL listed and CE marked
Illumination	• Externally mounted illuminating lamp with separate switch to illuminate the work area.
Light	• High intensity, low wattage >800 lux • It should be 15 Watts, ,1½ Feet length– 1 No. each
UV lamp	• Pre-mounted UV lamp (30 W) with separate switch with UV light hours run indicator.
Other accessories	• Two gas outlets in the working area, one on each side wall • Leveling Screws & Castor Wheels • PAO (Poly Alpha Olefin) test port • Easily changeable pre-filters • Fitted with UV Germicidal lamp for sterilization. • Pre-installed pressure gauge for Measurement of HEPA Filters Choking system. • Ensure noiseless operation and anti-vibration construction provides efficient working environment. • Audible or highly visual alarm for filter replacement warning
Electrical sockets or Pass Through Ports	• Side mounted switches for minimum three (15/5 amp) electrical sockets for ancillary equipment operation or • Convenient rear-wall pass through ports for safe routing of instrument cords, cables and leads for 15/5 amps multiple socket with switches on the wall,
Standards Compliance	• Performance specifications and construction must meet or exceed OSHA, ANSI and relevant international standards to assure operator safety
Certification required for sign off	• Test Certificate for Mini-Pleat HEPA Filters • Calibration Certificate for Pressure Gauge • Calibration Certificate for Air Velocity Anemometer,
Spares	• Spare compatible UV lamp– 2 Nos • A spare HEPA filter for chamber – 1 No • Gas burner (Bunsen burner) – 2 Nos

Operation and maintenance 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 scientific personnel operating the system and support services till customer satisfaction with the system.
Warranty	Warranty for 2 years after satisfactory installation 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 (hard copy and soft copy) of:- • User, technical and maintenance manuals to be supplied in English language along with machine diagrams; • List of equipment and procedures required for local calibration and routine maintenance; • Service and operation manuals (original and copy) to be provided; • Advanced maintenance tasks documentation; • Certificate of calibration and inspection
IQ/OQ/PQ	Pre-requisites before PQ All instrument like magnehelic gauges should calibrated before PQ DQ, IQ & OQ should completed before PQ. The following tests shall be carried out for PQ of LAF: Filter integration and installation leak test: HEPA Filters Integrity Test with PAO (Poly Alfa olefin). PAO penetration shown by photometer should be less than 0.001% through the filter media and should be "zero" through mounting joints Air velocity Air particulate matter counts (Non-viable & Viable) Air flow pattern using White visible or yellow smoke generator, Carbon tetra chloride or dry ice for smoke generation
Certificates Performance and safety standards (specific to the device type); Local and/or international	Should be compliant with the requirements of FDA/CE/BIS • Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements (or equivalent BIS Standard) • Certified to be compliant with IEC 61010-1, IEC 61010-2-40 for safety
Supplier/ Manufacturer	• Must be ISO certified for quality
Service Support Contact details (Hierarchy Wise; including a toll free/landline number)	• Contact details of manufacturer, supplier and local service agent to be provided; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer;
Recommendations or warnings	• Any warning signs would be adequately displayed
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.BIO SAFETY CABINET CLASS II TYPE B2 **(TOTAL EXHAUST)**	
Application: Biological safety cabinet (BSC) is containment (physical barrier) intended to protect laboratory workers, laboratory environment and work materials from exposure to biohazardous aerosols and splashes while working with pathogens and infectious agents, such as primary cultures and stock. In the Class II Type B2 cabinet all inflow and down flow air is exhausted after HEPA filtration to the external environment without recirculation within the cabinet. This cabinet protects the work as well as the worker.	
Specifications	**Requirement**
Cabinet (Material of construction)	• Cabinet should be made from Galvanized Iron 18 SWG sheet metal with polyurethane paint coated finish and bottom will be supported with MS with PU coated modular stand which can be adjustable for height with leveling legs/or motorised. • External surfaces to be coated with antimicrobial coating to protect against surface contamination and inhibit bacterial growth. • Interior work area to be from a single piece of stainless-steel with large radius corners to simplify cleaning. • The cabinet work area must have s no welded joints, which collect contaminants or rust.
Unit	The unit must be a bench top / console model. • Front door Made of clear 5 mm thick Toughened glass, vertical sliding, with Feather touch Motorized operation, while opening the door UV Lamp will be cut "OFF" And while closing the door UV Lamp will be "ON" Automatically. • Side Panels: Both the sidewalls are made from double layered outer GI & inner stainless steel with return-air plenum in between. • Edges should be perforated to avoid entry of room air into the work zone and exit of contaminated air in to the room and such contaminated air is sucked through this full height perforation at the edges of the sidewalls. • A recessed central area with drain pan to contain spills and prevent liquids from entering the lower filtration unit • The BSC shall be ergonomically designed for maximum user comfort and adjustability. • Fail-safe system to ensures that in case of exhaust failure, the cabinet's main fan automatically shuts down to ensure safety to the user
Cleanliness level	The system should have • CLASS 100 (ISO 5 for particle sizes 0.5 µ < 3530 particles/M^3 of air at both at Rest & • Operation Condition as per ISO 14644(ISO 5 (Class 100) • US-FS 209 E) Conforming to NSF/ANSI 49, USA & En12469 standards.
Working area	• Minimum 4 x 2 x 2 Ft (w x d x h) • Interior work area to be from a single piece of IS304 grade

	stainless-steel with large radius (joint free) corners to simplify cleaning. • The cabinet work area must have s no welded joints, which collect contaminants or rust.
Work table	It should have Removable type tabletop, made of perforated IS 304 Stainless Steel with satin finished.
Direction of flow	Vertical
Air Balancing	100% Exhaust & 0 % Re-Circulation
Particle retention:	0.3-micron particles with typical efficiency of >99.997%0.3 micron particles with typical efficiency of >99.997%
Airflow Speed	Minimum airflow velocity of 90 ft/minute ± 20 through the work access opening. Velocity should have 90 Feet/Minute ± 20 Easy to-read LCD/other display for continuous monitoring of cabinet airflow
Supply Air Blower	It should consist of dynamically & statically balanced aluminum centrifugal impeller driven by a single phase, 1440-RPM motor, enclosed in a PU coated Suspended in a pair of springs & connected to the filter chamber through flexible canvas duct inside the cabinet.
Exhaust Blower	• It should have suitable displacing capacity having a static of 60 mm WG and made of mild steel and directly driven by a single phase, 1440-RPM motor. The exhaust motor & blower unit to be connected to the cabinet through an exhaust duct made of rigid PVC pipe.
Exhaust Duct	• Direct-ducting (a leak-tight duct, a leak proof damper in the duct above the cabinet) to an exhaust system vented to the outside of the building without recirculation. Exhaust duct made of 125 mm diameter rigid PVC pipe. Suitable protection from rain with canopy at the end of the duct.
HEPA Filters	The filters should have • Type: Separator less type, Mini-Pleats HEPA Media • Media: Ultra clean glass fiber paper • Retention: 0.3 Micron • Efficiency: 99.997% • Initial Pressure: 12 mm WG • Grade: H14 rating • Real-time display panel for remaining Filter lif
Pre-Filters	• Media: Synthetic, non-woven polyester • Casing: Epoxy painted GI frame • Retention: 10 -15 micron • Efficiency: 90% • Initial Pressure: 6 mm WG • Grade: F7 rating
Noise level	< 65 decibels on "A" scale ± 5 as per NSF 49
Cabinet Control systems	Should have • Pressure gauge, • motor voltage regulator, • audible and visual window alarm, • main and outlet power circuit breakers, • Power switches for exterior mounted fluorescent lights and /

	or ultraviolet lights, interior outlets, and blower motor etc.
Illumination and light intensity	Must deliver uniform lighting to the work surface for greater comfort, reduced glare and improved productivity High intensity, low wattage, >800 lux Choke less to withstand larger fluctuations in voltage, Must be placed in a position to avoid turbulence in working area.
UV germicidal lamp	• Germicidal UV lamp - Controlled by automatic UV lamp timer (lamp hours) • Emission of 254 nm • Lamp should be positioned away from operator line of sight for safety and proper exposure to interior surfaces. • UV lamp should be in working zone • The UV lamp should automatically switch "off" when the front door is opened to avoid accidental exposure of UV rays to the users'. • UV Lamp Test: Output should not be less than 40 microwatts per square centimeter at a wavelength of 254 nanometers (nm)
Alarms	• An audio alarm must be installed to indicate loss of exhaust flow. • Should have Audible alarm to warn the operator if the window is raised above the recommended height
Certification required for sign off	• Down flow Velocity and Volume Test report • Inflow Velocity Test report • Airflow Smoke Patterns Test report • Lighting Intensity Test: • Test Certificate for Mini-Pleat HEPA Filters • HEPA Filter Leak Test with poly alpha olefin (PAO) or di (2-ethylhexyl) sebecate /polyethylene glycol • Calibration Certificate for Pressure Gauge • Calibration Certificate for Air Velocity Anemometer, • Warranty Certificate
BSC standard compliance	• Meet American (NSF/ANSI) or European standard EN 12469 (type tested) or both
Power Supply	• Power supply should have 220-240 V, 50 Hz. And all components UL listed and CE marked Electric supply requirement
Operation and maintenance 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 and support services till customer satisfaction
IQ/OQ/PQ	• On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument.
Certificates Performance and safety standards (specific to the device type); Local and/or international	Should be compliant with the requirements of FDA/CE/BIS • Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements (or equivalent BIS Standard) • Certified to be compliant with IEC 61010-1, IEC 61010-2-40

	for safety
Supplier/ Manufacturer	• Must be ISO certified for quality
Service Support Contact details (Hierarchy Wise; including a toll free/landline number)	• Contact details of manufacturer, supplier and local service agent to be provided; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer;
Recommendations or warnings	• Any warning signs would be adequately displayed
Warranty	• Warranty for 2 years after satisfactory installation and working excluding consumable parts and accessories.
Comprehensive Maintenance	• Comprehensive Maintenance of the equipment supplied, installed, commissioned for 60 months after 2 years Warranty/Defects Liability Period. This will include yearly calibration start-up / commissioning routine servicing, regular maintenance, preventive maintenance of equipment and components and break down repairs as and when occurring, ensuring that system does not remain out of service for a period more than 24 hours in case of major breakdowns and 6-8 hour in the case of minor breakdowns due to any unforeseen break down. The institution will provide Water / Electricity power, etc. for maintenance work. The successful tenderer shall keep the essential spares at site during the Contract Period to avoid the delay in attending faults / maintenance
Service contract clauses, including prices	• List of all spares and accessories (including minor) with part numbers and price, required for maintenance and repairs in future after guarantee/warranty period should be attached;
Operating manuals, service manuals, other manuals	Should provide 2 sets (hardcopy and soft-copy) of:- • User, technical and maintenance manuals to be supplied in English language along with machine diagrams; • List of equipment and procedures required for local calibration and routine maintenance; • Service and operation manuals (original and copy) to be provided; • Advanced maintenance tasks documentation; • Certificate of calibration and inspection
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.VERTICAL AUTOCLAVE

Application: A vertical steam sterilizer to provide safe, economical and effective sterilization for microbiology laboratories that do not want to compromise on quality, safety and reliability and need to sterilize liquids such as nutrient media and buffer solutions, Solid items such as pipettes, tubes and filters and Glassware and plastic articles.

Specifications	**Requirement**
Chamber	Vertical loading type chamber with service basket and complying to the strictest international directives and standards equipped with • Steam collection bottles to remove most of the steam during operation • Ware inlet and outlet valve • Drain valve for cleaning or changing with fresh water • Constructed with appropriate stainless steel with superior corrosion resistance to water and steam • High temperature and pressure resistant silicon gasket • Built-in analog pressure gauge • Manual pressure release valve • Wheels/casters for easy transport.
Chamber size/Capacity	• Approx. 80-120 lit
Gauges	• Should have a water level gauge • Analog gauges for measuring inner and outer steam pressure. • Should have an inner temperature indicator.
Chamber size/Capacity	• Approx. 80-120 L
Display	• Fully Automatic PID Control ± 0.1 °C • LED display for temperature and remaining time
Operating Temperature and accuracy	• Maximum 123°C • Temperature Accuracy: ± 0.5 °C at 121 ° C • Must have Temperature calibration function
Operating pressure and gauge	• 15 -20 psi • ANALOG PRESSURE GAUGE (0 -400 psi pressure gauge) indicating actual pressure
Timer	Automatic START/STOP timer
Safety warnings and alarms	• A cycle cannot start if the door is open or not properly locked • The door cannot unlock until chamber pressure reaches room pressure • Over-Temperature Cut-Off with audio visual alarm • Low Temperature Warning: If the temp. stays below 121°C for more than 5 seconds • Low Heat Warning: If the temp. does not reach the sterilization temperature during the set periods

		• Over-Pressure Cut-Off with audio visual alarm • Over Current Cut-off with audio visual alarm. • Low Water Level heater cut-off and ALARMS
11	Accessories	• Perforated corrosion free baskets made up of SS 304 (3-4 Nos.) that are stackable two high or even more levels, • Silicone gasket
12	Calibration certificates	Certificate from ISO17025 accredited lab for temperature, pressure gauges & timer.
13	Operation and maintenance 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 and support services till customer satisfaction
14	Certificates Performance and safety standards (specific to the device type);Local and/or international	Should be compliant with the requirements of FDA/CE/BIS • 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
15	Supplier/ Manufacturer	• Must be ISO certified for quality
16	Service Support Contact details (Hierarchy Wise; including a toll free/landline number)	• Contact details of manufacturer, supplier and local service agent to be provided; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer;
	IQ/OQ/PQ	• On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument.
17	Recommendations or warnings	• Any warning signs would be adequately displayed
18	Warranty	• Warranted for 2 years after satisfactory installation and working excluding consumable parts and accessories.
19	Comprehensive maintenance	Comprehensive Maintenance of the equipment supplied, installed, commissioned for 60 months after 2 year Warranty/Defects Liability Period. This will include start-up/commissioning routine servicing, regular maintenance, preventive maintenance of equipment and components and break down repairs as and when occurring, ensuring that system does not remain out of service for a period more than 24 hours in case of major breakdowns and 6-8 hour in the case of minor breakdowns due to any unforeseen break down. The institution will provide Water / Electricity power, etc. for maintenance work. The successful tenderer shall keep the essential spares at site during the Contract Period to avoid the delay in attending faults / maintenance
20	Service contract	• List of all spares and accessories (including minor) with

	clauses, including prices	part numbers and price, required for maintenance and repairs in future after guarantee/warranty period should be attached;
21	Operating manuals, service manuals, other manuals	Should provide 2 sets (hardcopy and soft-copy) of • User, technical and maintenance manuals to be supplied in English language along with machine diagrams; • List of equipment and procedures required for local calibration and routine maintenance; • Service and operation manuals (original and copy) to be provided; • Advanced maintenance tasks documentation; • Certificate of calibration and inspection
	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. INCUBATORS 1) AMBIENT TO 70 °C, 2) 5 °C TO 50°C and 3) 37 □C	
Application: For incubation of organisms, such as on agar plates, and also for conditioning of heat sensitive media and to provide an optimal, homogeneous, temperature uniformity and stability to ensure that protocols are fully reproducible –	
Specifications	**Requirement**
Material of construction	• Double walled construction with complete inner chamber made of Corrosion resistant stainless steel (AISI 430) • Outer chamber should be of steel sheet finished with powder coated point Insulation to maintain desired temperature • Inner glass door • Inner chamber should be fabricated with ribs for adjusting shelves to convenient height and shelves to be supplied • Shelves should be made of polished stainless-steel sheet as per chamber
Capacity	• 150- 200 L
Temperature range	• Temperature should be thermostatically controlled • Temperature should be thermostatically controlled with range 1) Ambient to 70˚ ±1˚ C and 2) 5 °C to 50°C ±1˚ C 3) 37 C±1˚ C • Over-Temperature cut-off with audio/ visual alarm • Low Temperature Warning alarm
Unit	• Air ventilators to be provided on both side • The equipment should be provided with microprocessor controlled digital display • Temperature homogeneity between top and bottom shelves should be maintained by forced circulation
Calibration	Certificate from a ISO 17025 accredited lab for 3 different temperature points
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 compliant with the requirements of FDA/CE/BIS • 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
IQ/OQ/PQ	• On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument.
Service Support Contact details (Hierarchy Wise;	• Contact details of manufacturer, supplier and local service agent to be provided; Any Contract

including a toll free/landline number)	(AMC/CMC/adhoc) to be declared by the manufacturer;
Recommendations or warnings	• Any warning signs would be adequately displayed
Warranty	• Warranty for 2 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; • Certificate of calibration and inspection
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. DIGITAL COLONY COUNTER	
Application For fast and accurate bacterial or mold colony counting and to aid in determining counts of colony clusters and exceedingly large or small colonies, and can accommodate multiple dish sizes or formats	
Specifications	**Requirement**
Material of construction	Full Stainless-steel fabricated body with duly heat cured epoxy coating.
Display and counting	It should consist of • Digital display up to 4 digits with confirmation by audible tone. • It should consist of Magnifying lens (greater than 2X magnification with digital marking pen) • Accepts petri dish up to size 140 mm diameter with a centering adaptor for standard 90 mm petri dish • Glare free viewing low energy bright LED's • A switchable black background viewing translucent and difficult to see colonies. • Zero reset button
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 compliant with the requirements of FDA/CE/BIS • Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements (or equivalent BIS Standard) • Certified to be compliant with IEC 61010-1, IEC 61010-2-40 for safety
Supplier/ Manufacturer	• Must be ISO certified for quality
Service Support Contact details (Hierarchy Wise; including a toll free/landline number)	• Contact details of manufacturer, supplier and local service agent to be provided; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer;
Recommendations or warnings	• Any warning signs would be adequately displayed
Warranty	• Warranty for 2 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; • Certificate of calibration and inspection
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. LAB BLENDER (PADDLE TYPE)	
Application: A powerful compact and ergonomic lab blender adapted for optimal homogenization and bacterial extraction without cross contamination	
Specifications	**Requirement**
Unit	• Should have chamber of stainless steel with an opening door • Should have multi-function digital display Provision of adjustable blending power with on screen indicator. • Should have provision of removable paddles for cleaning and autoclaving • Should have facility for side by side paddle stop. • Provision of fully opening door facility for easy cleaning.
Disposable bag size	Appropriate to the model & capacity quoted
Capacity	50-400 ml
Temperature	Ambient operating temperature 10-35^{o}C.
Humidity range	Operating relative humidity range should be 10-89%
Adjustable timer settings	1sec-60 mins.
Paddle speed	Variable speed (4-10 strokes /sec or better
Sensor	To ensures immediate stop of blending in the event of a leakage
Accessories	Bags (1000 numbers), Bag clips (50 numbers) Bag storage rack/stand (2 numbers) Bag sealer
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 compliant with the requirements of FDA/CE/BIS • 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
IQ/OQ/PQ	• On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument.
Service Support Contact details (Hierarchy Wise; including a toll free/landline number)	• Contact details of manufacturer, supplier and local service agent to be provided; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer;
Recommendations or warnings	• Any warning signs would be adequately
	displayed

Warranty	• 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; • Certificate of calibration and inspection
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. SEROLOGICAL WATER BATH	
Application: The water bath is for routine use in microbiology protocols as well for proper suspension of microbes in the medium with precise temperature control	
Specification	**Requirement**
Material of construction	• Rounded, seamless stainless-steel bath to preventing rust, chemical damage and contamination. • Powder coating like epoxy coating exterior for easy cleanup • Corrosive resistant stainless-steel Gabled drip free lid
Unit	• Microprocessor controlled digital display. • Instrument should have lift up drip free bath cover; • Carrier racks should be given for flasks and test tubes racks. • Convenient water bath drains. • Water bath surface coating should prevent contamination and formation of algae. • Easy cleaning
Temperature	• Temperature Range: +20°C to 99°C • Temperature Accuracy: ± 0.2 °C at 37 .0°C • Temperature Uniformity: ± 0.5 °C at 37 .0°C • Digital LED display for operating status of TEMP • Over-Temperature Cut-Off • Temperature calibration function
Alarms	• Audible warning safety signals should be there for high/low temperature warnings • Low liquid level
Calibration	• Certificate from a ISO 17025 accredited lab for 3 different temperature points
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 compliant with the requirements of FDA/CE/BIS • Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements(or equivalent BIS Standard) • Certified to be compliant with IEC 61010-1, IEC 61010-2-40 for safety
Supplier/ Manufacturer	• Must be ISO certified for quality
Service Support Contact details (Hierarchy Wise; including a toll free/landline number)	• Contact details of manufacturer, supplier and local service agent to be provided; Any Contract (AMC/CMC/ahoc) to be declared by the manufacturer;
Recommendations or Warnings	• Any warnings would be adequately displayed
Warranty	• Warranty for 2 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; • Certificate of calibration and inspection
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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8. BINOCULAR/ COMPOUND MICROSCOPE

Application: A System complete with illumination system is required for proper viewing and enumeration of individual cells, even living ones with high magnification microscope using 2 eye lenses to reduce the eyestrain

Specifications	**Requirement**
Body	• Body-Single mold sturdy stable base stand, inclined Binocular body 30 °, 360º rotatable head with focus adjustment controls. • A durable textured acid resistant finish • All optical parts including objectives, eye pieces and prisms should have anti-reflective coating which also gives anti-fungal property. • All metallic parts should be corrosion-proof, acid proof and stain-proof.
Eye piece	• -Highest quality 10 X/20mm wide angle anti fungus field eyepiece. One with pointer. Diopter adjustment must be present on both eye pieces. (the image of the object as seen through the binocular eyepiece should be well defined centrally in at least 2/3 field of view) • Achromatic, wide field, 10 x with inbuilt pointer. • The eyepiece should be aplanatic and have a minimum field number of 18 Diopter adjustment must be present on one/ both eye pieces or on the eye piece tube.
Optical system	• Optical system should be infinity corrected. • Built-in LED light source with white light with intensity control and LED life of more than 10, 000 Hrs.
Objective	• -Parfocal, antifungal coated 4×, 10×, 40×and 100× (oil immersion) with semi planner achromatic correction. • Objective should be well centered even if their position on turret is changed. • 10×, 40× and 100× objectives should have numerical apertures of 0.25 and 0.65 respectively. • 100×should have numerical aperture of 1.25 and should be of oil immersion. • Unbreakable containers to be provided for storing the objectives. • All objectives should be wide field, achromatic and par focal.
Nose piece	• Backward tilted revolving nose piece suitable to accommodate four objectives with click stop • . It should be provided with rubber ribbed grip for easy rotation mounted on a precision ball bearing mechanism for smooth and accurate alignment. Extra ports if any should be fitted with dust& fungal proof metallic/ebonite caps.
Focusing:	• . Coaxial coarse and fine focusing knob, capable of
	smooth, fine focusing movement sensitivity; minimum: 300 micron; focusing stop for slide safety. ..

Stage	• Stage uniformly horizontal, mechanical stage having dimensions of length 140 mm (+/- 20mm) with fine Vernier graduations (minimum reading accuracy of 0.1 mm). • It should be designed with convenient sub-stage vertical coaxial adjustment for slide manipulation. • The stage should have ball-bearing arrangement to allow smooth travel in transverse directions i.e. 80 mm (+/- 5mm) and front to back direction, 50mm (+/- 5mm).
Sub-stage condenser	• Abbe-type condenser with numerical aperture (N.A.) 1.25 focusable with rack and pinion arrangement incorporating a spherical lens and an iris-diaphragm
Sub-stage illuminator	• The system should have a build-in variable light source (Illuminator). • This light source should have a 20 W, 6 V Halogen lamps. • The system should be provided with a step down transformer and an on-off switch and intensity control. • The lamp should be provided with a lamp socket which has the facility for easy replacement of the bulb
Power supply & protection	• Voltage 220 V AC, 50Hz. should have one on-off power switch • A plano-concave mirror in fork mounting should be supplied which would be attachable to the base for field use when power is not available. • Should have over-charging cut-off with visual symbol
Battery backup	• Minimum 1 Hour
Operating and storage conditions	• Capable of operating continuously in ambient temperature of 10 to 50 ° C and relative humidity of 15 to 90% in ideal circumstances. • Storage condition: Capable of being stored continuously in ambient temperature of 0 to 50 °C and relative humidity of 15 to 90%
Manual Accessories	• Working manual should be provided with each microscope. • Immersion oil 25 ml × 2 • lens tissue paper 2 rolls or boxes) • Lens cleaning solution (100 ml) • One anti-static cleaning brush. • The unit shall be capable of being stored continuously in ambient temperature of 0 -50 deg C and relative humidity of 15-90%.
Digital camera	• 5 mega pixel scientific grade (even at dim light) colour CCD camera along with image capture and analysis software and c-mount adapter. Resolution at least 2448 x 1920 effective pixel (4 x 4 binning and 2 x 2 binning) and 10-bit digitization. • Microscope should come along with PC (i5 6200U
	processor, 6 GB RAM, 1 TB HDD, DVR R/W, LED 20”). With UPS (minimum offline backup of 30 minutes).

Certificates Performance and safety standards (specific to the device type); Local and/or international	Should be compliant with the requirements of FDA/CE/BIS • 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
IQ/OQ/PQ	• On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument.
Service contract clauses, including prices	• List of all spares and accessories (including minor) with part numbers and price, required for maintenance and repairs in future after guarantee/warranty period should be attached;
Operating manuals, service manuals, other manuals	Should provide 2 sets(hardcopy and soft-copy) of:- • User, technical and maintenance manuals to be supplied in English language along with machine diagrams; • List of equipment and procedures required for local calibration and routine maintenance; • Service and operation manuals (original and copy) to be provided; • Advanced maintenance tasks documentation; • Certificate of calibration and inspection
Warranty	• Warranty for 3 years after satisfactory installation and working excluding consumable parts and accessories.
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.
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

9. HOWARD MOLD COUNTER	
Application: It is use in determining mold counts (mold fibres and spores) in tomato products and for mold counting in food quality control applications for other fruit-based preparations and **mold** mycelia in butter and cream.	
Specification	**Requirement**
Counting chamber	Constructed entirely of glass. Centre of glass should contain a 15x20mm rectangle that is flanked by 0.1 mm shoulders on each side to support cover glass Rectangle and Cover glass should have optically plane surfaces Facilities for calibration of microscope
Eyepiece micrometer	Ruled into squares (grid), each of which is equal to1/6 of the diameter of the eyepiece diaphragm opening
Cover slips	Thin 28mm x 33mm x 0.5mm 2 Nos Thick 28mm x 33mm x 1.0mm 2 Nos
Certificates Performance and safety standards (specific to the device type); Local and/or international	Should be compliant with the requirements of FDA/CE/BIS
IQ/OQ/PQ	• On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument.
Service contract clauses, including prices	• List of all spares and accessories (including minor) with part numbers and price, required;
Demonstration and training	The supplier will have to carry out successful demonstration at our laboratory premises (where ever the system has to be installed) and provide on – site comprehensive training for scientific personnel operating the system till customer satisfaction with the system.
Certificates Performance and safety standards (specific to the device type); Local and/or international	• Should be in compliance with the requirements of FDA/CE/BIS.
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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10. BOD INCUBATOR	
Application: For use in microbiological laboratories to measure biochemical oxygen demand (BOD). The incubators are used to sustain and control the humidity and temperature essential to perform many types of experiments in, microbiology and biology cells.	
Specifications	**Requirement**
Double walled modular structure with 3" thick PUF insulation	i) Outer wall: Powder coated steel sheet with resin baked finish/texturized steel ii) Inner wall: Stainless steel SS304 with ribs for adjusting removable perforated shelves at the height of 45 mm. The nuts, screws and hinges of the inner chamber shall be of Stainless Steel 304 iii) Perforated Stainless Steel 304 Partition tray (6 nos.)
Doors	Double door type • Inner Door: Full view inner acrylic/tempered glass door with aluminum channel boundary, closes on a resilient gasket and permits view of the specimens (inside the Incubator), without disturbing the thermal conditions inside the chamber. • Interior illumination • Outer Door: Powder coated steel sheet with resin baked/texturized steel finish
Capacity	• 350-400 L
Temperature Range	• 5°C to 60°C with digital controller, • Temperature increments 0.1° C
Control Accuracy	• ± 0.1 °C or better (at 60°C).
Distribution Accuracy/uniformity	• ± 1 °C or better (at 37°C).
Temperature display	• Microprocessor based Digital display of temperature along with calibration certificate by ISO 17025 accredited agency. • The unit should have 2 independent PT 100 sensor for measuring the temperature with auto switch over function in case one of the sensors fails. • Temperature recorder for inner chamber with maintenance free battery backup and auto charging of battery
Air circulation	• With two completely in-built motors along with fan to keep the temperature uniform throughout the chamber or
Heat up time & Cool Down time	• 30 min. up to 60 ° C without load. • 40 min. up to + 5 ° C without load
Timer	• 0 to 24 hrs X 7 days cyclic ON / OFF timer for illuminating port
Safety Alarms	Provision for audio-visual alarm to indicate • Door opening after 2 min. • Self -diagnosis function including overheat /underheat
	• Prevention and overcurrent Protection

Computer Interface	RS 485 / RS232 interface for multiple & single communication port
Voltage stabilizer	Automatic Stabilizer, 4 KVA with TDR (3minutes) electronic type
Documents Certificates Performance and safety standards (specific to the device type); Local and/or international	Should be compliant with the requirements of FDA/CE/BIS • 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
IQ/OQ/PQ	• On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument.
Service contract clauses, including prices	• List of all spares and accessories (including minor) with part numbers and price, required for maintenance and repairs in future after guarantee/warranty period should be attached;
Operating manuals, service manuals, other manuals	Should provide 2 sets (hardcopy and soft-copy) of: • User, technical and maintenance manuals to be supplied in English language along with machine diagrams; • List of equipment and procedures required for local calibration and routine maintenance; • Service and operation manuals (original and copy) to be provided; • Advanced maintenance tasks documentation; • Certificate of calibration and inspection
Warranty	• Warranty for 2 years after satisfactory installation and working excluding consumable parts and accessories.
Operation 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.
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. MICRO FILTRATION UNIT	
Application: Used for the collection and preparation of samples, mobile phases, and buffers to obtain the highest quality results from 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
Warranty	2 years after successful installation and demonstration
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. FUMIGATOR (FOGGER)	
Application: Fumigation and fogging are two methods commonly used in laboratories to control the microbial contamination. For fogging a fogger machine that dispenses the fogging solutions uniformly across the contaminated area is used.	
Specifications	**Requirement**
Capacity	• 5 L with easy cleaning facility
Material of construction	• Body should be compact, durable, leak proof and made of stainless steel /heavy duty plastic
Particle size	• It should produce aerosols with particle size of less than 5 microns • The blower head should be rust proof inert to Formaldehyde, $KMnO_4$, H_2O_2 and deliver aerosols uniformly.
Unit	• It should be compatible with all disinfectant solutions usual concentration. • It should be compatible with maximum pH range (both acid and alkali). • The equipment should be of good quality and conform to national/ international standards.
Power supply	• The machine should operate on 220 +- 10 volts, 50 Hz, single phase, A.C • Provided with Cable should be at least 5 meters in length, ISI marked.
Operation	• The discharge rate should not be less than 1 L/25 minutes. • The tank capacity, discharge rate and timer on the machine should be so that the disinfectant should be able to disinfect 4000-5000 cubic feet in one cycle of 2 hours (max).
Operation and training component	• The supplier will have to carry out successful demonstration 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
Warranty	• Warranty for 3 years after satisfactory 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; • Service and operation manuals (original and copy) to be provided; • Advanced maintenance tasks documentation;

Payment	Payment only after satisfactory performance demonstration

13.ANAEROBIC JAR	
Application: The Anaerobic Jar System provides oxygen free environment applied in microbiological laboratories for the isolation/culturing of anaerobic and microaerophilic microorganisms	
Specifications	**Requirement**
Capacity	• 12 L total volume (1 no) • 3-4 L (1 No)
Material of construction	• Transparent, unbreakable polycarbonate jar.
Unit	• Jar should be provided with pressure -cum -vacuum gauge attached to the lid • Jar should be ideal for all strict anaerobic test conditions. • Lid should consist of O- ring gasket. • It should be provided with petri dish (100 mm diameter) carrier/SS rack. • Schrader valve and screws to connect to vacuum pump
Vacuum pump	• Suitable oil free vacuum pump for the system
Accessories	• Catalyst/gas pouch startup kit • Anaerobe indicator tablets • Lid, complete with clamp and screw • O rings
Operation and training component	• The supplier will have to carry out successful demonstration 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 compliant with the requirements of FDA/CE/BIS • Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements(or equivalent BIS Standard) • Certified to be compliant with IEC 61010-1, IEC 61010-2-40 for safety
Supplier/ Manufacturer	• Must be ISO certified for quality
Service Support Contact details (Hierarchy Wise; including a toll free/landline number)	• Contact details of manufacturer, supplier and local service agent to be provided; Any Contract (AMC/CMC/ad-hoc) to be declared by the manufacturer;
Recommendations or warnings	• Any warning signs would be adequately displayed
Warranty	• Warranty for 3 years after satisfactory 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; • Service and operation manuals (original and copy) to be provided; • Advanced maintenance tasks documentation;
Payment	Payment only after satisfactory performance demonstration

14.AUTOMATIC SAFETY BUNSEN BURNER

Application: The Bunsen burner is a common laboratory tool used for heat sterilization. It provides a flame with temperatures up to 1200°C. It is commonly used for processes like sterilization, combustion, and heating. In microbiology laboratories, it is commonly used for micro-loop sterilization

Specifications	**Requirements**
Application	For use in Laminar flow chambers and Biosafety cabinets for sterilization of loops etc.
Basic features	• Safety Bunsen Burner with flame monitoring, overheating protection and display movement sensor for safe operation. • Two adjustment knobs for air and gas to allow easy fine-tuning of flame size and temperature. • For heating applications or to flame-sterilize necks of large Erlenmeyer flasks, the Safety Bunsen Burner should be equipped with a long burner head.
Operation modes	Manual by matches, Infrared sensor with the push button without the need of a lighter, Foot switch.
Material	UV- and solvent-resistant, Smooth, chrome-plated metal housing.
Operating manuals, service manuals, other manuals	Should provide: - • User, technical and maintenance manuals in English language • List of equipment and procedures required for routine maintenance • Service and operation manuals to be provided Advanced maintenance tasks documentation.
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).
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	1. All accessories for running with natural gas should be supplied including tubing 2. Main adapter 3. Adapter for standard gas hose with inner diameter 10 mm.
Performance certificates	• Should be in compliance with the requirements of FDA/CE/BIS. • 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 C: AUXILIARY EQUIPMENT

1. CENTRIFUGE (REFRIGERATED	
Application: A Multi-functional, general purpose High speed refrigerated bench top centrifuge used for separation of supernatants (liquid portion) from pellets (solid portion)	
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 years, 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 in compliance with the requirements of FDA/CE/BIS. • 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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also

	unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system
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 -20 ⁰ C to -30⁰ C.	
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 compliant with the requirements of FDA/CE/BIS • 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. 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.)/ SS 304 of 18-20 gauge thickness. • 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 of granite 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	Warranty for 2 years, 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	Should be compliant with the requirements of FDA/CE/BIS • 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

4. 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 L 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. Should be compliant with the requirements of FDA/CE/BIS 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

5. 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/ Stainless Steel 304 Grade
Internal Chamber	Stainless Steel 304 Grade
Insulation	Mineral Wool/ Ceramic Wool
Door	• Inner: Stainless Steel 304 Grade • Outer**:** Powder coated Mild Steel/ Stainless Steel 304 Grade • 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	40 ^{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/SS tube/pipe heater
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,	Should provide:

service manuals, other manuals	• 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	Warranty for 2 years, 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	Should be compliant with the requirements of FDA/CE/BIS • 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

6. HOT PLATE	
Application: Hot plates are generally used to heat liquids as a part of sample preparation for analysis	
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 250°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	Should be compliant with the requirements of FDA/CE/BIS • 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

7. HOT PLATE CUM MAGNETIC STIRRER	
Application: Hot plates are generally used to heat liquids. Hot plate with magnetic stirrer 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 or better
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	Warranty 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	Should be compliant with the requirements of FDA/CE/BIS • 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. SOLVENT FILTRATION UNIT	
Application: Used for the 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 4. 47 mm disc filters 5. 90 mm disc filters 6. 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 c) Aqueous solvents d) 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

9. MICROWAVE DIGESTION SYSTEM	
Application: Microwave digestion is a common technique used for elemental analysis. It is used to digest the food samples for their quantification using instruments like ICP-MS.	
Requirement	**Specification**
General	The instrument should have a superior pressure venting which is not temperature dependent 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 control mechanism. 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 2 g per vessel/) 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 provide 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 12-20 PTFE vessels, work station & torque wrench. Vessels on the rotor should be segmented for easy use. Maximum Temperature capacity of vessel up to 300 °C Pressure capacity of vessel up to 100 bar (1500 psi) or more Vessel volume: offered vessels should be able to handle volumes as minimum as 3 ml, 10 ml, 15 ml & 25ml 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. Additional twelve numbers of vessels (of both sizes) as specified above should be supplied along with the system

Magnetron	Single/ 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 between 1400-1900W 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. Instrument should have adequate safety coatings on housing to prevent any corrosion in the cavity. 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 with ***glass window.*** 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) with at least 20GB on board / built in memory for storage of data 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 (minimum 18 cm (7 inch)). 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 for external printer (HP Deskjet series) 2. Minimum two RS-232 serial ports for connecting PC balance and service check

Computing	PC with 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 compliant with the requirements of FDA/CE/BIS Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements (or equivalent BIS Standard) Certified to be compliant EN 61326, EN 61000 GLP-validated software for controlling the system
Supplier/ Manufacturer	Must be ISO certified for quality
Operating manuals, service manuals, other manuals	Should provide • Hard copy of User, technical and maintenance manuals in English language and. should be available on the system also • 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	Warranty for 2 years, 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 (4-5 KVA) to support the instrument.
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	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. 5. Should provide calibration certificates from NABL accredited agency every year during warranty & CMC period. Calibration cost will have to be borne by the supplier.
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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a

	minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system
Payment	Payment only after installation, validation and performance demonstration

10. MUFFLE FURNACE

Application: A muffle furnace generates the high-temperature up to 1600 °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. 7 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 years 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 all essential spares and accessories
UPS	UPS/Stabilizer as required for functioning of the equipment
Quality Requirement	• Should be in compliance with the requirement of FDA/CE/BIS. • 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

11. FROST FREE REFRIGERATOR

Application: It is commonly used equipment at microbiology lab for the purpose of storage of items which required low temperature i.e., between 4 ⁰ C to 8 ⁰ C e.g. food samples, media, chemicals, reagents, cultures.

Specifications	**Requirements**
Design	• Vertical with wheels • Frost free, CFC free, Automatic Defrost • 4 – 5 Height adjustable shelves • Internal LED Lighting • **Single Triple-Pane Glass Door with ergonomic** handle Key Lock • Automatic door closing • Fan forced air circulation to ensure stable & uniform preservation environment.
Controller	• Microprocessor Temp. Control Controller with 0.1ºC resolution • Controller to Display data about the unit and used to control temperature • Control panel should be at eye level with Digital Temperature display & Alarms
Construction	Electro-galvanized steel with white, oven baked epoxy-polyester, anti-microbial, powder-coated finish with 304 Stainless Steel inner chamber
Capacity	300 - 350 L
Temperature	• Range: +1⁰ C to +10⁰ C • Uniformity: ±3°C
Alarm	Open door, High/Low temperature, Clogged condenser filter
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.
Recommendations or Warnings	Any warning signs would be adequately displayed
Warranty	2 years 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	Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer. Contact details of manufacturer, supplier and local service agent to be provided, including toll free/ Landline Number.
Training	Training of personnel After supply, training on instrument operation and troubleshooting etc., to be given to all laboratory personnel.
List of Spares and Accessories	Accessories as required for functioning of the equipment
UPS	UPS/Stabilizer as required for functioning of the equipment

Quality Requirement	Should be compliant with the requirements of FDA/CE/BIS • 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

12. VACUUM 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	27 L or more
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/Rockwool
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 1 (One) Torr Vacuum Indication: Analog/ Digital gauge Vacuum pump: Rotary vane oil less Timer: Special timer for vacuum system
Operation function:	Fixed temperature operation, Auto-start operation,
Safety features	Self-diagnosis functions (Sensor, Heater Triac, Automatic overheating prevention), independent overheating prevention, Key lock function, Electric leakage breaker
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 years 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 compliant with the requirements of FDA/CE/BIS . • 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

13. VORTEX MIXER (CYCLOMIXER)	
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 years 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 compliant with the requirements of FDA/CE/BIS • 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. 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 to incubate samples containing 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 ~10-15 L (one) Bath volume ~20-25 L(one
Power	Power switch integrated in keypad
Temperature Stability / Uniformity @ 37°C	±0.02 °C
Adjustable shaking frequencies	Adjustable shaking frequencies from 20 to 150 RPM or better
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
Safety features	Self-diagnosis function (Heater defective, Sensor defective, Set value abnormal, SSR short circuit and Overheat protector) Warning buzzer and alarm lump, Over current, short circuit breaker, Heater no-load operation prevention device
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 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	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 compliant with the requirements of FDA/CE/BIS • 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

15. 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 40 x 40 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 years 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 compliant with the requirements of FDA/CE/BIS • . • 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

16. 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 Pyrogens <0.001 Eu/ml RNases free, <1pg/ml DNases free, <5 pg/ml
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	2 years 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 compliant with the requirements of FDA/CE/BIS • Manufacturer and Supplier should have ISO 9001:2015 for Quality Management System & ISO 14000:2015 for Design of process plant, Design, manufacture & technical support of water purification equipment. • Electrical safety conforms to the standards for electrical safety EN 61326-1 EMC requirements Electrical equipment for measurement, control & lab use. • EN 61010-1 Safety requirement of electrical equipment for measurement, control & laboratory use.
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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system.
Payment	Payment only after installation, validation and performance demonstration

17. 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 L capacity Option 2: 200 – 275 L 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. Spray arms made of AISI 316L stainless steel (DIN 1.4404)
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
Circulation pump	For Option 1: 150 – 200 L capacity: Should have heavy washing pump feeding washing chamber spray arms and wash cart direct injection circuit: 550W power (290 L/min) For Option 2: 200 - 275 L capacity: Should have heavy washing pump feeding washing chamber spray arms and wash cart direct injection circuit: 750W power184.92 gal.US/min (700 L/min)
Steam condenser	Should have Standard steam condenser which prevents vapors from entering into the washing area
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,	Should provide: -

service manuals, other manuals	• 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 years 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 in compliance with the requirement of FDA/CE/BIS • 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.

Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system.
Payment	Payment only after installation, validation and performance demonstration

18. 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 compliant with the requirements of FDA/CE/BIS • 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

19. 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: +/-2 °C
Gas Regulator and Gauge Range	0 to 30 psi.
Nitrogen gas generator	Technical specifications as specified under Nitrogen generator
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 years 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 compliant with the requirements of FDA/CE/BIS • 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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be

	maintained in a serviceable condition to avoid complete breakdown of the equipment/system.
Payment	Payment only after installation, validation and performance demonstration

20. 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 to180°C or more with set and actual temp. display
	Maximum Safety	The glass parts should be Plastic Coated
	Speed	**(20 ~200 RPM) or more.**
	Lift:	Motorized/Electronics
	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	10 mbar or better.
	Power consumption	180W
	Operating Voltage	100 ~ 240 V 50Hz
	Sound Level	32-57 dBA
Vacuum controller	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 53 solvent with auto detection of required vacuum
	Facility	Can be used independently if required
Re-circulating chiller	Cooling capacity	550W cooling power @15^{o}C
	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	+/-2 °C
	Tank volume	3.0-5.0 L
	Flow Rate	2.5-5 L/min or more
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 years 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 compliant with the requirements of FDA/CE/BIS 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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system.
Payment	Payment only after installation, validation and performance demonstration

21. ULTRA SONIC BATH	
Application: Used for cleaning fitters, mixing, homogenization, dissolving and dispersion of particles in solvents	
Specifications	**Requirements**
Tank capacity	5 L 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 years 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 compliant with the requirements of FDA/CE/BIS 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

22. 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, PLC Controlled Bench Top of modular design, compact in size, **LCD Touch Screen user interface** 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 **It should have a Hydrocarbon removal unit.** The equipment should be capable of running for 24 hrs. round the year
Installation	Indoor or benchtop Should work in temperature range of 15 to 30 °C in humidity range of 60-90%
Flow rate	1,250 ml/min
Purity	Better than 99.999%, :< 0.05 ppm Total Hydrocarbons
Delivery pressure	85 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. 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	Any warning signs would be adequately displayed
Warnings	

Calibration certificate	Calibration certificate from ISO17025 for sound level and evidence for N2 purity
Warranty	2 years 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 compliant with the requirements of FDA/CE/BIS 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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This

	amounts to total maximum downtime of 37 days per year. Also unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system.
Payment	Payment only after installation, validation and performance demonstration

23. 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 years 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 compliant with the requirements of FDA/CE/BIS 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. 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 years 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 compliant with the requirements of FDA/CE/BIS 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.
Outage conditions	After two years of warranty period, 3 years of CAMC shall be undertaken by the supplier. This would also include: a. Preventive maintenance service: The seller will provide a minimum of two Preventive Maintenance Service visits during a year to the operating base to carry out functional checkups and minor adjustments/tuning as may be required. b. Breakdown Maintenance Service: In case of any breakdown of the equipment/system, on receiving a call from the buyer, the seller is to provide maintenance service to make the equipment/system serviceable. c. Response time: The response time of the seller should not exceed 48 hours from the time the breakdown intimation is provided by the Buyer. d. Serviceability of 90% per year is to be ensured. This amounts to total maximum downtime of 37 days per year. Also, unserviceability should not exceed 2 working days at one time. Required spares to attain this serviceability may be stored at site by the seller at his own cost. Total down time would be calculated at the end of the year. If downtime exceeds permitted downtime 'Liquidated Damages' would be applicable for the delayed period. e. Maximum repair turnaround time for equipment/system would be 3 days. However, the spares should be maintained in a serviceable condition to avoid complete breakdown of the equipment/system.
Payment	Payment only after installation, validation and performance demonstration

25. 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 min 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			
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

26.ELECTROMAGNETIC SIEVE SHAKER	
Application: Traditional sieve analysis is the standard method 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 joint less 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 institutions where same model has been installed in the previous 2 years
Warranty	2 years 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 compliant with the requirements of FDA/CE/BIS 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. MICROFUGE	
Application: A compact bench top Mini Centrifuge for 96-well plates used for centrifuging plates before setting up for PCR, RT-PCR and protein estimation by ELISA.	
Specifications	**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 plate rotors • 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 & Automatic lid release • Aerosol tight lid
Temperature range	• -5ºC to 40 ºC
Speed	• Maximum speed: 2000 rpm or better for 96 well plate r
Timer	• Timer set up to 99 minutes
Rotors	• Rotor for 2 x 96 well plate • Rotor for 1.5ml with adapters for 0.2 ml
Power requirement	• 220 v to 240 v -50 Hz If a voltage stabilizer is required, it should be supplied along with the unit
Voltage stabiliser	• Suitable voltage stabilizer to be provided
Certificates Performance and safety standards (specific to the device type); Local and/or international	Should be compliant with the requirements of FDA/CE/BIS 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
IQ/OQ/PQ	On site IQ, OQ of instrument along with document to be provided & supplier to assist till satisfactory PQ of instrument.
Service contract clauses, including prices	• List of all spares and accessories (including minor) with part numbers and price, required for maintenance and repairs in future after guarantee/warranty period should be attached;
Operating manuals, service manuals, other manuals	Should provide 2 sets (hardcopy and soft-copy) of:- • User, technical and maintenance manuals to be supplied in English language along with machine diagrams; • List of equipment and procedures required for local calibration and routine maintenance; • Service and operation manuals (original and copy) to be provided; • Advanced maintenance tasks documentation; • Certificate of calibration and inspection
Warranty	Warranty for 2 years after satisfactory installation and working excluding consumable parts and accessories.
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.
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. BOTTLE-TOP DISPENSER

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

Requirement	**Specification**				
General	For free dispensing of concentrated acids such as HNO_3, HCl, HF, H_2SO_4, and liquid H2O2 Simple single-hand usage				
Material	Metal-free construction Corrosion resistant components for high concentrated acids (also HF) Reproducibility for base solutions				
Types of bottle dispenser	Type Analog, variable volume	Range of volume to be dispensed (mL)	Volume increment (mL	Accuracy Full scale	
	1-10 mL	1-10 mL	0.25 or less	≤ ±0.5%	
	10-50 mL	10-50 mL	1.0 or less	≤ ±0.5%	
	50-100 mL	50-100 mL	1.0 or less	≤ ±0.5%	
Safety features	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.				
Working temperature range	Dispensers should be suitable to work in 20-40 °C temperature range.				
Calibration certificate	Calibration certificate from ISO 17025 Laboratory according to ISO 8655 standards.				
Accessories	• 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				
Quality Requirement	Should be compliant with the requirements of FDA/CE/BIS • Should provide calibration certificates from NABL accredited agency every year during warranty & CMC period. Calibration cost will have to be borne by the supplier.				
Warranty	Warranty for 2 years, 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				
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

29. HOT AIR OVEN
(For Drying Glassware)

Application: For drying glassware and also for conditioning of heat sensitive microbiology media and to provide an optimal, homogeneous, temperature uniformity and stability to ensure drying is complete

Specifications	**Requirement**
Material of construction	• Should have double walled construction, with high quality insulated steel. Inner walls of 304 qualities SS, Outer walls of Epoxy Powder coated GI sheets/textured SS. • Facility for adjustable shelves, 8-10 removable shelves to be provided. • With internal lighting facility, Insulated door fitted with heavy hinges, mechanical door lock.
Capacity	• 200-600 L
Temperature range	• Temperature should be thermostatically controlled • It should be Ambient +5°C to 250°C with temperature setting accuracy ±0.5 °C with forced air circulation for temperature uniformity • Separate PT 100 sensor and display for temperature (LED/TFT) • Safety alarms
Unit	• Air ventilators to be provided on both side • The equipment should be provided with microprocessor controlled digital display • Temperature homogeneity between top and bottom shelves should be maintained by forced circulation
	• Certificate from an ISO 17025 accredited lab for 3 different temperature points
Power supply	• All electrical peripherals required for smooth functioning e.g. voltage stabilizers should be provided.
Accessories	• Should have all the accessories required for the functioning of the equipment.
Certificates Performance and safety standards (specific to the device type); Local and/or international	Should be compliant with the requirements of FDA/CE/BIS Electrical safety conforms to the standards for electrical safety IEC 60601- General requirements(or equivalent BIS Standard) Certified to be compliant with IEC 61010-1, IEC 61010-2-40 for safety
Supplier/ Manufacturer	Must be ISO certified for quality
Service Support Contact details (Hierarchy Wise; including a toll free/landline number)	Contact details of manufacturer, supplier and local service agent to be provided; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer;

Recommendations or warnings	Any warning signs would be adequately displayed
Warranty	• Warranty for 3 years after satisfactory 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; • Service and operation manuals (original and copy) to be provided; • Advanced maintenance tasks documentation;
Supplier/ Manufacturer	Must be ISO 8655 certified for quality
Service Support Contact details (Hierarchy Wise; including a toll free/landline number)	Contact details of manufacturer, supplier and local service agent to be provided; Any Contract (AMC/CMC/adhoc) to be declared by the manufacturer;
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. DOUBLE DOOR (SIDEBY SIDE) REFRIGERATOR

Application: A refrigerator is used for storing reference cultures, media, homogenized samples, reagents etc

Specifications	**Requirement**
Material	Stainless steel
Capacity	Approx. 500 L and above
Adjustable Shelves	Tempered glass shelves 05 No.
Doors	Two Stainless steel doors side by side Refrigerator and freezer must be side by side
Temperature Range	Independent Digital display and temperature controls for refrigerator and freezer Refrigerator +2^{o} to +8^{o}C Freezer -15 to -20 ^{o}C
Audio alarm	Alarm if door is ajar for long
Inner body	Rust Free Material
Refrigerant	CFC / HCFC Free
Frost Free	In built Voltage Stabilizer 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
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.
Warranty	2 years after successful installation and 10 years for the compressor
Payment	Payment only after installation, validation and performance demonstration