TENDER FORM

ACHARYA N. G. RANGA AGRICULTURAL UNIVERSITY
AGRICULTURAL COLLEGE, BAPATLA-522 101
ANDHRA PRADESH

Last date and time of receipt of bids	:	**03rd February, 2018, 4.00 pm**
Time and date of opening technical bids	:	**07th February, 2018, 10.00 am**
Place of opening bids	:	**Conference Hall,** **Diamond Jubilee/PG Building,** **Agricultural College,** **BAPATLA, 522 101,** **Guntur District, Andhra Pradesh**
Address for communication	:	**ASSOCIATE DEAN,** **Agricultural College,** **BAPATLA, 522 101,** **Guntur District, Andhra Pradesh**
		agbptcic@gmail.com
		9989625203

TENDER APPLICATION FORM

1. Item Quoted for and serial number (as per the Tender Specifications) :
2. Name and Address of Organization (Phone, Fax and E-Mail address) :
3. Name and Designation of Head of the Organization :
4. Year of incorporation (Proof of Registration Certificate) :
5. Number of qualified service personnel :
6. Response generation (Immediate / 1 day / 2 days) :
7. No. of orders taken up so far (Enclose User(s) list) :
8. In case of urgent repairs, please indicate the correct contact person Name and Phone Number :
9. Photostat copies of all the documents prescribed in Terms and Conditions are enclosed :

SIGNATURE OF THE TENDERER

Note: Tender application forms without Photostat copies of all documents prescribed in terms and conditions will not be considered.

TENDER FORM
(To be used by the Tenderers)

From

To
Associate Dean
Agricultural College,
BAPATLA 522 101

Ref: 1. Your Tender Notice No. ……..Dated……..
2. EMD – D.D. No…….Dated……for Rs……..

* * *

I/We have the contents of the terms and conditions mentioned in your tender schedule and its enclosures and agree to abide by the same.

I/We hereby offer to supply the articles prescribed in the schedule (or such portion thereof as you may specify on the acceptance of tender) at the price given below.

I/We agree to hold this offer open for a period of twelve months from the date of acceptance of tender and shall be bound by communication of acceptance dispatched within a period of 15 days from the date of opening of tenders.

I/We have also examined the requisite specifications of the material to be supplied and my/ our offer to supply the required material in accordance with the requisite specifications.

I/ We carefully considered all terms and conditions in Annexure A and B and particulars regarding settlement of disputes and we have signed the same in token of consciously accepting the same and do hereby state that we accept them without any reservations and accordingly I/we quote the rates inclusive of all taxes, duties, transportation, training and installation at ***Central Instrumentation Cell, Agricultural College, BAPATLA-522 101, Guntur District, Andhra Pradesh,*** insurance etc., as below:

Name of the item **Unit** **Unit price in Rupees**

The articles will be ready for delivery within ……days from the date of receipt of firm orders.

Yours faithfully,

(Signature and stamp of the Tenderers
State legal status, Whether prop.,/
Partner/ registered firm/company Etc.,)

Encl: Samples enclosed

EMD-DD. No……dated……for Rs……..

Note: Attach additional sheets giving full particulars such as name and address of the proprietor of list of partners and their addresses or particulars of registered firm or of the company and the specifications of the samples furnished.

TENDER NOTICE

Acharya N. G. Ranga Agricultural University invites quotations / tenders from *authorized dealers / distributors* for the supply of the following analytical instruments for *Central Instrumentation Cell, Agricultural College BAPATLA, Pin 522 101 Guntur District, Andhra Pradesh State, India.*

General Terms and Conditions:

1) **Technical quote / bid, and Price quote / bid, should be submitted separately in separate sealed envelopes duly specifying Item Number and should be dropped in separate boxes specified.**
2) The quotations/tenders should be submitted in a sealed cover, super scribing ***"Quotation/ Tender (TECHNICAL BID) or (PRICE BID) for the supply of _____ (Item No:) for Central Instrumentation Cell***" on the envelop addressing to the ***"The Associate Dean, Agricultural College, BAPATLA, Pin 522 101 Guntur District, Andhra Pradesh, India***".
3) Tenderer can drop their bids between 10 am to 4 pm at the office of the Associate Dean, Agricultural College, BAPATLA (Complete Address given below)
4) Only item numbers 1 to 66 as specified in technical specifications should be provided with EMD and item numbers 67 to 125 won't attract EMD.
5) *A compliance statement in detail for each individual technical parameters / component of each instrument including warranty etc. as given in each instrument SHOULD be prepared by the vendor in the Technical Bid / Quote. Each page (both original and photocopied) of the same should be duly attested by the manufacturer along with authorised seal.*
6) Taxes, if any, should be mentioned clearly (tax rate and tax amount, tax wise - CGST, SGST etc.).
7) Each firm should submit only one quotation/tender for each item.
8) Separate quotation/ tender for each individual instrument/equipment should be submitted.
9) Validity of quotations/tenders should be at least twelve months from last date of receipt of quotations/tenders.
10) Product brochures should be enclosed for each equipment with authorised stamp and signature on every leaf
11) Warranty: *minimum of 3 years from the date of installation or as specified in the technical specification of the instrument*.
12) Make and Model should be mentioned clearly.

13) Name of the customer/s with telephone, e-mail ID should be given, for each instrument, separately.
14) The service network team / persons with contact numbers, mailing address, e-mails preferably in Andhra Pradesh should be given for each instrument separately.
15) *If the instrument is imported*, the supplier should take all responsibilities for clearing, duties, delivery and installation at Central Instrumentation Cell (CIC), Agricultural College, BAPATLA and CIC, Agricultural College, BAPATLA, ANGRAU will not hold any responsibilities in this regard. The University will provide Customs Exemption certificate only.
16) Installation should be Free.
17) IQ, OQ and PQ should be done for each instrument at free of cost.
18) Training has to be provided free of cost to have hands on working experience on the equipment
19) All the supplies should preferably be through authorized dealer / distributor in Andhra Pradesh (Authorized dealer / distributor certificate should be enclosed along with quotations/tenders).
20) All quotations / tenders for each instrument should have comparative statement / compliance report as per the specifications mentioned each instrument, point wise.
21) Quotation of each item should conform strictly to the technical specifications prescribed in the tender notice.
22) All the instruments should be delivered and installed at Central Instrumentation Cell, Agricultural College, BAPATLA at free of cost or the price quote should include the delivery charges, if any. *No additional changes will be paid by ANGRAU towards delivery and installation.*
23) All instruments should be supplied along with *hard copies of operating manual* and soft copies in CD / DVD / flash drive, or software programs installed at no extra cost wherever required.
24) The delivery should be based on the instructions (e-mail) from the ***Associate Dean, Agricultural College, BAPATLA***.
25) The quotations/tenders ***should reach to the office of the Associate Dean, Agricultural College, BAPATLA (Address given below) on or before 4 PM of 03.02.2018.***
26) Successful bidder shall have to deposit a **security deposit of 2%** of the quoted amount of the item and this deposited amount will be kept with Associate Dean, Agricultural College, BAPATLA (ANGRAU) for minimum of 3 years from the date of supply and installation of the equipment.
27) The University reserves the right to cancel the tender process at any point of time without assigning any reasons.

Address for Correspondence:

The Associate Dean,
Agricultural College,
BAPATLA, PIN 522 101
Guntur District,
Andhra Pradesh, **INDIA**
E mail: agbptcic@gmail.com
Mobile: 9989625203

TECHNICAL SPECIFICATIONS

Item No.	NAME OF EQUIPMENT	TECHNICAL SPECIFICATIONS
1	Portable Photosynthesis and Fluorescence System	The package should be ideal for field or lab work that includes the Fluorescence measurement. • **CO_2 Control** • CO_2 control range: 0 – >2000 µmol mol^{-1} (with pump set to low; dependent on bulk flow rate) • CO_2 cartridge type: 8 gram or **Lesser** • Cartridge lifetime: >8 hours after puncture (dependent on set point) • CO_2 Scrubber: Soda lime • **H_2O Control** • H_2O control range: 0 - 90% RH (non-condensing) • **Light Measurement** • Chamber and light source PAR sensors: • Sensitivity range: 0 - 3000 µmol m^{-2} s^{-1} • Resolution: <1 µmol m^{-2} s^{-1} • Calibration accuracy: ±5% of reading • **External PAR Sensor** • Detector: Silicon photodiode • Calibration accuracy: ±5% of reading. • **Console** • Memory: On Board or Removable 1GB SD cards typically store up to 16 million sets of data /or better with unlimited data storage using thumb drives (Memory Stick) • Power requirements: 12 – 18 VDC • **Sensor Head** • 4.5 cm^2 size leaf chamber or better. A tripod for the leaf chamber should be provided for continuous field application. • Leaf Temperature: 5^0 C to 50^0 C • Self positioning microchip thermistor/Energy balance/manually positioned thermistor or thermocouple or radiation sensor for non –contact measurement • Light Sensor : 1 • Sensor Head Light Source Connections : 1 • Clear Leaf Chamber • Maximum Leaf Area : 4.5 cm^2 or Better • Up to 2000µmols m^{-2} sec^{-1}, by high efficiency, low heat output, mixed red/blue LED or White LED Light unit **The system should include following items/ accessories:** • Console - 1 Nos. • Sensor head - 1 Nos. • Cable assembly - 1 Nos.

		• Fluorometer Chamber or integrated meter • Instrument carry case - 1Nos. • Accessory Carry case - 1 Nos. • Carrying harness - 1Nos. • Tripod • AC to DC power Supply – 1Nos. • Suitable Battery Charger • Drierite - 3 Nos. • Soda Lime – 2 Nos. • 8 gm CO_2 Cartridges or Less (3 Boxes of 25 Each) –Total 75 • Spare Kit for the Leaf Chamber • Three Year Comprehensive Warranty
2	Quantum Sensor with data logger	• Absolute Calibration :± 5 % traceable to US National Institute of Science and Technology /or Equivalent • Sensitivity : Typically 5µA to 10µA per 1000µmol/s/m² • Linearity: Maximum deviation of 1% up to 10,000 µmol s^{-1} m^{-2} • Response Time : less than 1µs • Cosine Corrected • Detector : High stability silicon photovoltaic • Sensor Housing : Weatherproof anodized aluminum body • Operating Temperature Range: − 40 °C to 65 °C • Relative Humidity Range: 0% to 95% RH, Non-Condensing • **Data logger :** • Measurement Interval : 1.0 Second to 24 hours (Programmable) • Number of Measurements Supported : Unlimited • Analog Channels : 10 • Operating Temperature : up 45°C or more • Display Type: 2 line backbit LCD • Keypad Type : in built touch keypad • Memory Built-In : Sufficient memory to store upto minimum 1000 sets of data • Power Requirements : 10-16VDC (20VDC max) • Suppliers should provide adjustable tripod for field studies. • Must be able to connect 3 quantum sensors and should be compatible with quantum sensors • Three Year Comprehensive Warranty
3	Plant canopy analyzer	To measure Leaf Area Index - Indirect Method through Radiation Sensors • Control Unit PDA • Inputs: 2 connectors for optical sensor interface cables. • 2 connectors for Radiation Sensors (quantum, pyranometer, or photometric). • Memory: 128 MB for data storage (over 1.5 million readings). • Keypad: tactile response keypad. PDA Keypad • Display: graphics LCD display. • Communications: USB (as mass storage device); --RS-232. • Clock: Year, Month, Day, Hour, Minute, Second. /or PDA DISPLAY • Accuracy of ±3 min/month. • Power Requirements: 4 “AA” batteries (alkaline, NiMH, or lithium or better). • Battery Life: 140 hours with 4 “AA” alkaline batteries, no optical

		sensor attached. 80 hours with 4 "AA" alkaline batteries, with one optical sensor attached. • Three Year Comprehensive Warranty
4	Leaf image analysis system	• **Conveyor Belt and Speed:** • Convenient measurement of large numbers of leaves • Long leaf mode - measures leaves >1m length • Conveyor Belt Unit • The leaves must be gripped and flattened by twin transparent belts which are mounted one above the other, on soft rubber O-rings, on pairs of counter- rotating rollers. • The system should have high speed leaf area meter apart from basic and standard mode. • The Conveyor Belt should run on both forward and reverse directions using switches on the Conveyor control box with emergency stop mode 60/100/140/ 190 mm/sec maximum speed. • **Resolution:** 1280x1024 Pixels (Conveyor Mode) • 2048x1536 Pixels (Standard Mode) • **Minimum Object Size:** 1 Pixels • **Maximum Sample:** 250x290mm (Conveyor) • **Area:** 250x>1000mm (Long Leaf Mode) **Accuracy:** Area Measurement :+or- 04%typical - ± 1% typical • Disease and Healthy Area :Contrast Dependent • Long Leaf Mode:+ or -04% Typical • Color Depth: 24 bits color space (16 million colors) • Image File Format: .jpg , .bmp and .tif • Operating System and Drivers: Windows XP and VISTA **Salient Features** Three types rapid thresh holding, editing images, Object Count, exchange of data and images, measurement parameters of area, perimeter, length, width ,circularity, elongation, shape factor, virtual conveyor mode for the leaf images. Seeds, needles, or other small objects should be counted. Colour thresh hold for easy discrimination of different types of object, or disease spots. Minimum object area defining. • **Parts and accessories to be supplied** • 230 V /50 Hz operating Data Acquisition System with a suitable UPS Software with dongle key protection, adjustable camera stand with scaling ,USB color • **IDS Imaging camera** with Precision lens, Light Box (two independent lamps), Over head Light rig with four independent lamps that can be moved and angled as needed(with spare bulbs acrylic sheets, Spare Conveyor Belt Material to make 10 pairs of belts, Colour Rendition Card and Target Set type WTS. • **Conveyor spares:** "O" rings and drive bands and other necessary accessories. • **Supply Voltage:** • Supply voltage: 230V 50Hz AC 250mA maximum • Mains input via IEC mains connector. • Three Year Comprehensive Warranty
5	Leaf Porometer	• The principle of measurement should be dynamic diffusion • **Sensor head** • **Cups:**(a) slot, 2.5 x 17.5 mm, rounded ends (b) circle, 6 mm diameter

		• **RH sensor:** Vaisala • **Temp. sensors:** high precision thermistors • **Light sensor:** photodiode • **Cable length:** 1.2m • **Data handling** • **Reading memory:** up to 1500 readings with full annotation • **Data interface:** RS232 serial, up to 9600 band, supplied with connector and adaptor for direct connection to PCs • **Software:** for Windows, saves data to a comma-separated ASCII data file (.CSV) • **Control unit** • **Display:** 8 lines x 40 character LCD/**LED** • **Keys:** 13 function keys, plus full QWERTY keypad • **Carrying case:** padded with shoulder & waist straps. • **Power supply** • **Battery:** internal rechargeable, 20 hour duration • **Charger:** separate unit, 12 to 15V DC, 0.5A, 220 or 240V AC • Mains input • **Recharge time:** 14 hours • Three Year Comprehensive Warranty
6	Plant stress meter	• Fluorescence unit with integral fluorescence optical probe • 10 dark adaption leaf clips • Battery charger • USB cable, instruction manual and carry case. • Test Modes: Fv/Fm, OJIP. • Displayed parameters: Fo, Fm, Fv/Fm, Fv/Fo, O, K, J, I, P, tFm, A, Mo and PI/ABS. • Excitation/Actinic source: Solid state 660nm source. • Saturating 525-6,000μE. • Detection system: Related pulse excitation detection with high resolution sampling mode for Kautsky induction curve recording. • Detectors and filters: A PIN photodiode with a 700nm-750nm bandpass filter. • Test duration: Fv/Fm: 0.1-1.5 seconds. OJIP: 3-300 seconds. • Sampling rate: Up to 10μS. Digital output: • USB. Storage capacity: Up to 160,000 data sets and hundreds of experimental traces. • User interface: • Display: Colour graphic display. • Keypad: 10 key dedicated function keypad. • Power supply: Rechargeable NiMH battery pack. Battery life: 8 hours of continuous operation. • Three Year Comprehensive Warranty

7	Smart Field Lysimeter	• Digital Gravimetric Weighing Lysimeter: 1m x 1m Depth – Cylindrical/square
		• Building/Tank Material:
		  ◦ Stainless Steel/Mild Steel Minimum 6 mm
		  ◦ Thickness (Welded properly without any leakage) with Tapper at bottom for leachate collection
		• Weighing Equipment : Load Cells –**Precession** – Output connectable to a logger or a Digital Panel meter
		• Soil Capacity : Up to 4000 kg.

		• Seepage water Determination : Suction Cups evacuated through motorized pump • Probe Installed : Electronic Tensiometer, FDR Soil Moisture Sensor, Leaf Wetness Sensor, Soil Temp probe two depths each and one reference each. • Data recording; 1(one) hourly Battery recharge – weekly, Date retrieval through laptop. Optional output through GPRS modem should be quoted. • Outer Tank: Fabricated from **this** gauge Stainless Steel/Mild steel painted • Complete installation and training should be provided to the user free of cost. • Three Year Comprehensive Warranty
8	Flame Photometer	Micro-processor controlled with automation in operation, Measurements; to estimate Na, K, Li, and Ca in single aspiration of samples. Calibration: 5 point calibration. Correction: Curve fitting correction for non-linear emission characteristics of element at higher concentrations. Data storage: up to 700 -800 results. LCD display with minimum 20 character readout for easy reading. Facility for re-standardization. Built in real time clock. Printout facility (printer port should be provided). Compressor with air filter and regulator. Range of testing: 10-100 ppm for Na and 1 -100 ppm K; 2-50 ppm for Li, 100-300 ppm for Ca. Full scale sensitivity: 2 ppm for Na; 1 ppm for K and Li, 30 ppm for Ca. Interference filters for Na, Li, Ca and K should be free. Reproducibility: Low conc. $\pm$ 1% f.s.; High Conc. $\pm$2% f.s. Minimum sample: 3 ml / element**.** Must be provided three years comprehensive warranty
9	Atomic Absorption Spectrophotometer	Double Beam Atomic Absorption Spectrophotometer with vibration free optical system for applications in soil, environmental, and food analysis. Flame atomizer with Acetylene / LPG flame. Coded burner for safety protection. Wavelength range: 185-915 nm. Optics: Double Beam, Sealed, Vibration free optical system with a reflective optical compartment. Detector: PMT. Mono chromator. Czerny-turner type with holographic grating of 1800 lines/mm and reciprocal linear dispersion better than 1.6 nm/mm, focal length 300 mm using a Photo multiplier tube Detector. Special bandwidth: 0.1 nm, 0.2 nm, 0.4 nm, 1.0 nm, 2.0 nm (software selectable). Wave length accuracy: $\pm$ 0.15 nm. Wave length reproducibility: <0.05 nm. Resolution: 0.2 nm $\pm$ 0.02 nm. Baseline stability: 0.005 A / 30 min. Sensitivity (Cu): > 0.9 absorbance or better for **5 ppm Cu solution**. Detection Limit: Cu < 0.004 ug/ml (flame). Background correction: Deuterium arc, self reversal. Nebulizer: High efficiency Nebulizer. Burner Head: Titanium Alloy. Atomisation Chamber: Corrosion resistant material. Position adjustment: Automatic changeover, Manual changeover, Automatic adjustment of optimum height for burner. The system should have all safety features required for the system which includes Burner identification, Flame Sensor, Gas Leak Sensor, Low Gas Pressure Sensor, Drain Trap Sensor & Power Loss Protection. Automatic 8 lamp turret to hold 8 different lamps. Hollow Cathode Lamps: Eight (Iron, Copper, Zinc, Manganese, Cadmium, Lead, Cobalt and Chromium) lamps with 36 months warranty. Software: Integrated software for control of AAS parameters and Auto sampler parameters. Capability for post runs calculations of all parameters. System validation procedures must be available. Filled acetylene gas cylinder with 2 stage

		pressure regulator. Suitable laboratory fume exhaust hood to house the AAS. The total price for all above items for integrated AAS, Hollow Cathode Lamps, Software, Acetylene Cylinder and Fume Hood should be quoted as integrated essential accessories to the instrument along with System Controller (Computer) with latest software & Printer Data System. A compliance statement for each item above should be prepared and attached. Auto Sampler: Auto Sampler with Auto Dilution facility for flame configuration, with 6ml and 12 ml sample vial, minimum 34 positions, with reproducibility of Cu < 1.0% (air / LPG), including facilities such as pressure protection for wash, position adjustments using software. All the method parameters related with lamp selection, lamp current and heating, calibration, control of flow gases should be through windows based software. The AAS unit will be operated with windows Software for controlling analyzer, setting-up the method parameters, analyzing the samples, performing calibrations, etc. ACCESSORIES TO BE QUOTED IN MAIN SYSTEM • Acetylene Regulator • Acetylene Gas with Cylinder • Air Compressor • Vent and Hood Assembly with 10-15 ft. ducting. • PC and Printer. IBM COMPATIBLE PC with Intel processor (2GHz), 4 GB RAM, Min. 500 GB Hard drive, 8x/4x/32x CD-RW 9read/write), 21" colour monitor and graphics card supporting 1024 x 768 resolution, 16 bit sound card and speakers, colour printer, at least 1 USB port, 2 serial (RS232) ports, Windows 7/10 professional operating system (service – pack 1) installed, and PCI-IEEE interface card to allow control of the spectrometer. • Standard solutions for Hollow Cathode Lamps mentioned above. • Suitable Online conditioner which includes built in surge separation and isolation transformer to be quoted for the main system Training should be provided for our lab personnel both at our laboratory and principals manufacturing / testing facility. Demonstration**:** The performance and working of the instrument (hardware and software) should be thoroughly demonstrated at site (min of two days and two times). Must be provided three years comprehensive warranty.
10	Automatic Nitrogen Estimation System -Automatic Digestion, Scrubber and Distillation System	Twelve Place 250 ml capacity PC Compatible Block Digestion System with Casted Aluminium Alloy Heaters, Direct USB Port for PC/Laptop Connectivity, TFT Graphic Touch Screen Display. Unique wireless mouse to operate touch screen without PC at a distance of 2 metres from equipment. Data logging with real time clock, Memory stick for data storage with separate port in mother board, 70 programs & 12 sequence steps, PC chart software, Live graphical representation of time/temp. Gradient. Live Schematic process flow feature with display of various stages with facility to have print options. Software enables multiple units monitoring with multi user login feature. Inbuilt software

		program for micronutrient, macro nutrient, trace element, di acid and tri acid analysis. Upgradable to Auto lift Module, Electrical Requirement: 230 V, 50 Hz AC Mains. Four Stages Fully Automatic Microprocessor based acid neutralization scrubber with digital display integrated online with motherboard of digestion system with inbuilt pump for water recirculation • Should automatically start on operation of digestion system, should automatically stops on completion of digestion cycle with a delay time of 5 minutes to remove residual fumes. • Auto waste disposal & auto drain of tank water after pre programmable consecutive operations, Incorporates indication of drain cycles, low level indication and high level indication, • Auto fill error in case of absence of inlet water in tank and the system automatically switches off with alarm, inbuilt auto error diagnostic and safety features. Electrical Requirement: 230v/50Hz AC Mains. • Auto sequencing Programmable Microprocessor based Distillation with inbuilt software, Colour Touch Screen high resolution TFT LCD Display, Large (4.3") screen • Auto Intelligent run of programmable steps, Addition of Boric Acid, Dilution, $KMNO_4$ Addition for Available Nitrogen, Alkali Addition, Steam Processing, Residue Removal, Process over indication with alarm with inbuilt delay time features, Automatic Titration Connectivity feature for future up gradation, Aspiration of Receiver Residue. • Flow diagram display to show live auto sequencing steps at each stage of process, Data table export to excel • Facility to program and control distillate volume for determination of available nitrogen. • Auto sensing of "NO WATER" condition in condenser & steam generator with alarm & signal to alert user. • Auto deactivation of operation after warning on no water condition in case of user non availability • Enables automatic monitoring and measuring of high temperature in distillate with sensor for auto warning signal and safety alarm to alert user to control distillate temperature. **System should be provided with** • Provision for digital display of continuously measured temperature • Auto door open warning indication, Auto tube insert error indication. Auto deactivation of System on error diagnosis, Adjustable steam power, Auto online water saving mechanism, Auto reagent Level Sensor with Alarm for Reagents, Stainless steel non corrosive steam Generator • Inbuilt Automatic Printer for direct print out of results without connecting to PC. • Automatic calculation of results on input of titre value in terms of percentage of Protein/N2. • Automatic water level monitoring & Peristaltic pump for reagents addition • Electrical Requirement - 220 - 230V/50Hz. Refrigerated Water Cooling Circulating system with digital display of temperature, Inbuilt safety features with CE Certification

		to fulfil all statutory requirement of Good laboratory Practice. • Auto over temperature protection / Auto Error indication / Auto Sensor Break Protection, SS Tank, Submergible pump for recirculation, Over load protection, • Microprocessor based PID Temp. Controller, Temperature Range: 10°C to 20ºC. MS powder coating housing. Must be provided three years comprehensive warranty
11	CHNS Analyser for Macro (In homogeneous samples).	Instrument shall utilize a combustion technique independent detectors optimized for each element (thermal conductivity for nitrogen; infrared for carbon, hydrogen and sulfur) for simultaneous measurement of all elements of interest speeding the analysis time and eliminating the need for combustion gas separation techniques. Instrument automation must use a low-maintenance, rotating carousel that has a capacity for up to 30 samples for CHN Analyser. Instrument must be capable of performing an analysis for all elements within 4.5 minutes for CHN. Instrument must provide an external Horizontal furnace for sulfur determination. The internal / external sulfur module must be high temperature tube combustion with infrared detection compliant to ASTM D-4239, D-5016, and D-1619 using a reusable ceramic sample container. This Horizontal furnace capable of operating at 1450^{o}C for sulfur Analysis. The analysis time for S should be about 2 minutes. Instrument must be capable of determining carbon, hydrogen, and nitrogen in an organic sample using a sample mass up to 250 mg. Instrument must be capable of determining carbon and nitrogen in an organic sample using a sample mass up to 500 mg. Instrument must be capable of determining nitrogen in an organic sample using a sample mass up to 750 mg. Instrument must provide a two-stage combustion furnace that is capable of independent temperature control up to 1050°C. This furnace must provide a 100% oxygen environment with additional oxygen being supplied above the sample using a quartz lance. The furnace shall only utilize oxygen for the combustion process and use as a carrier gas in the furnace. The instrument shall not perform any form of chromatographic separation or whole gas analysis. Instead, the instrument shall employ a technique that reduces or extends the lifetime of chemical reagents, such as collecting the combustion gases in a collection apparatus, and sampling the equilibrated combustion gases. All chemical reagents utilized in the instrument must have a minimum lifetime of 500 analyses before reagent change is required, maximizing the uptime and reducing the operator time requirement related to routine instrument maintenance. The absolute range for CHNS should be Carbon: 0.02 to 175 mg Hydrogen: 0.1 to 12 mg Nitrogen: 0.04 to 50 mg S Range for 250mg sample 0.01 to 20 mg sulfur The system should be Computer Controlled with at least Windows 7 as OS. The system should have complete computer controlled Self Diagnostic with Help Screen in each step. The manual of the system should be inbuilt in the software. Also separate Operation and Service Manual should be given in CD. Must be provided three years comprehensive warranty

12	Simultaneous ICP-OES System (Inductive Coupled Plasma Emission Spectrophotometer)	Fully PC controlled true simultaneous ICP-OES with simultaneous and background correction reading ICP-OES system using solid-state detector technology with bench-top design. Echelle-based polychomator which utilizes **Charge Coupled** **Device (CCD) detector**. One Solid State Detector CID/CMOS) with larger surface to read all emission lines in one shot throughout the Wavelength Range. The resolution of the system must be **0.006 nm at around 200 nm**. A system purge of the optics for determinations at wavelengths below 189 nm is standard. The ICP torch must be **mounted radially as suitable for heavy matrix,** to the instrument optical path and demountable torch. Viewing of the plasma is computer controlled. Dual View is desirable (torch).The system should utilize at least Mercury or argon emission lines in situ to perform the function for calibration. Complete system should have extensive safety & service diagnostic facility. The instrument must have an Echelle-based Poly chromator with 500 mm focal length. Wave length Range: **165 nm to 1100 nm** & optionally extended range up to 135 nm or better for Halogen components to be offered. The instrument must have dual viewing capability i.e. axial, radial and dual view. Viewing of the plasma must be computer controlled & Horizontal torch for both the view of Plasma. Auto sampler. The system must include Minimum four channels, variable speed peristaltic pump. All the gas flow including auxiliary, nebulizer & coolant must be mass-flow controlled and variable. Range 0-20 L/Min for main Argon Flow. System must have Thermo stated optics, purging facility through nitrogen/ Argon. Chiller/re-circulator should be from the original manufacturer of imported origin. The Solid state RF generator must run at a frequency of 40/ 27 MHz. The RF power should be variable from 600-1500 W or better with capability to use maximum available power in any view i.e. radial and axial and dual view. Power Stability/Accuracy better than 0.1%. RF Generator must meet FCC & CE complies. The instrument should have efficient facility or technology to eliminate the cool end of the plasma to help minimize self-absorption and physical interferences, required accessory like Air Compressor/ Pump to eliminate this effect to be offered from manufacturer only. Should have built in extensive diagnostic & Service routine indication. **System software:** The instrument system software shall be based on the Windows operating system. The software shall provide full control of all instrument functions including plasma ignition, gas flows, viewing position, and monitoring of safety interlocks. It should features automatic identification of possible spectral interferences when selecting wavelengths for analysis and should have search mode for identification of unknown wavelengths. Feature of recalling for sample analysis done in past for revalidating results & checking for elements presents during

		run at any given point of time without even in case of non-availability of the sample which was analyzed in past. System software should able to display raw data with calibrations, spectral thumbnails,numeric data and should be able to recall full Echellogram. Software should offer all QC protocols & running the method for samples to check unknown elements in it. Sampling introduction Kit including Required Torch, Nebulizer and Spray chambers must be quoted for the analysis of high TDS, HF & organic samples separately. **Accessories:** Vendor should quote fume hood, Nitrogen gas cylinder and Argon gas cylinders with regulator, Latest PC & Printer from manufacturer, any other gas required to run the system including Aqueous samples. Vendor to supply required multi element standard 500ml to carry out satisfactory installation at our Lab. 10 KVA Stabilizer with isolation transformer & line conditioner to be offered. Should be provided with suitable auto sample handling-120 samples system. The system should be Computer Controlled with at least Windows 7 as OS. The system should have complete computer controlled Self Diagnostic with Help Screen in each step. The manual of the system should be inbuilt in the software. Separate Operation and Service Manual should be given in CD. **Installation:** The instrument with all software should be installed in our lab. The instrument should be demonstrated as per International protocol by running known standards as well showing the sensitivity, linearity, detection limit tests. Necessary standards have to be procured by user. The instrument should have analytical linearity in excess of 5-6 orders of magnitude with the ability to use alternate wavelengths that should be measured simultaneously. Suitable laboratory fume exhaust hood to house the ICP Training**:** Training should be provided for our lab personnel both at our laboratory and principals manufacturing / testing facility. Demonstration**:** The performance and working of the instrument (hardware and software) should be thoroughly demonstrated at site (min of two days and two times). Must be provided three years comprehensive warranty
13	NIR Grain Analyser	Near infrared Transmittance analyser for straight determination of protein, fibre, oil, starch, moisture, amino acids etc. in whole grains, **without grinding of samples**, directly on the original sample of maize, wheat, millet, pulses and oil seeds etc. with a system to divide the sample into sub-samples automatically. Instrument should be rugged, dust and waterproof, vibration tolerant with automatic data recording system. The optical system should contain scanning, grating mono chromator 570 - 1100 nm (Including Colour Range). Analysis time approx. 1 minute for a sample. The instrument to be supported by a flexible software package providing routine analysis, calibration and statistic with all essential accessories, built-in-multigrain cell & variable cell (6-33 mm). Instrument should have a built-in computer with HDD, FDD and keyboard in a single sealed unit, outlier function for calibration should be built-in, system should be able to handle Artificial Neural Network calibrations. Sample configuration : Stand-alone or network Temperature range : 0-48^{O}C Wavelength range : 570-1100 nm Data points : 100

		Bandwidth : 7 nm Detector : Silicon Digital signal processor (DSP) Used for internal communication and control. Treatments of scan data. A/D converter : 16 bit Data point generator : Scanning Monochromator with diffraction grating Measurement technique : Transmittance Type of sample : Whole grain and with the optional flour samples as well as crop management. Sample presentation : Flow through sample system. Sample cell : Multigrain cell handles different commodities. Communications : Telephone modem. LAN (TCP/IP)-Optional Rs-232 Calibration transferability : Yes Data Storage : Flash disk for results and scans. Result presentation : Locally on screen and printer as well as on local or central computer. Outlier detector : Yes Calibration technique : ANN Approvals : GIPSA and NTEP in USA, PTB in Germany and MI in France. STM module should be included for small volumes Warranty: Three years from the date of successful installation. Computer, Printer, UPS 2 KV need to be supplied along with the instrument. Optional modules like test weight module, flour module etc., if any may be quoted separately. Must be provided three years comprehensive warranty
14	Double Distillation Apparatus (Quartz), Horizontal Type	Made of high quality heat resistant quartz glass(Cylinders and Tubes, Resistant to minor damages and parts should be replaceable) Condenser made of quartz glass Demountable upper and lower boiler along with water level indicator having provision for easy cleaning and general maintenance Heater is high purity electronic grade transparent quartz type, capacity-3 K Watt, Single phase, heater outlet should be capped with Silicon Boots and should avoid contact of embedded boiler with water Cooling water consumption should not be more than 50 ltr/Hour Output capacity 4 Lt / Hr, should be of high purity water with a) Specific resistivity : should be minimum 18MΩ.cm at 25°C b) Specific conductivity : should be less than 1X10-6S/cm at 25°C c) pH : Should be 6.0 – 7.0. Must be provided three years comprehensive warranty
15	Line quantum sensor	Full spectrum line quantum sensor for LED and multiple light applications, to measure PAR integrated over 1-meter length to measure sunlight under a plant canopy, where the light field is non-uniform. Photosynthetic Photon Flux Density (PPFD) expressed as μmol s^{-1} m^{-2}. PPFD measurements needed over plant canopies in outdoor environments, greenhouses, and growth chambers, and reflected or under canopy (transmitted) PPFD measurements in the same environments. PPFD measurement with a cosine response accurate within ± 5 % at 75° zenith

		angle. Line quantum sensors with multiple detectors mounted along the length of a rugged anodized aluminium bar should provide spatially averaged PPFD measurements along the length of the bar. Absolute Calibration: ± 10% traceable to National Institute of Science and Technology (NIST). Response Time: 10 µs Temperature Dependence: ± 0.15% per °C maximum Operating Temperature Range: −40 °C to 65 °C Relative Humidity Range: 0% to 95% RH, Non-Condensing Detector: High stability silicon photovoltaic detector Sensor Housing: Weatherproof anodized aluminium housing. Cable Length: 10.0 ft. software for recording of output and digital display and to transfer from the meter to PC should be included Must be provided three years comprehensive warranty
16	Wall storage cupboard	Per meter 20 gauge electro galvanized sheet with Epoxy polyester powder coating. It should have front open type cupboard and horizontal partition will be provides. The unit should be fixed on the wall through the eye-let holes. Must be provided three years comprehensive warranty
17	Refrigerated Micro Centrifuge	• Compact refrigerated centrifuge with1.5/2ml rotor for 17,500 rpm & 30,130 x g rcf • Temp range – 11^0 c to 40^0 c • Machine should have "Fast temp program" • Up gradable to swing out rotor for MTP, PCR & deep well plate. • Noise level <54 dB (A) • Braking time – 15s • SOFT brake function • Rotor lid should be made of metal only or carbon composites • Automatic rotor imbalance detection • Machine should maintain 4^0 c at max speed with all rotors • Should have inbuilt condensation drain for avoiding corrosion. • Three year comprehensive warranty Rotors: 1. 48X 1.5/2ml rotor with 18,210g and 12700 RPM. 2. 6x15/50ml tube rotor, 7,830rpm & 7,197xg with 12 positions, 6 small and 6 large holes to accommodate appropriate "small" or "large" adapter and adapters for 15/50ml falcon tubes. 3. MTP Rotors for plates
18	Benchtop Refrigerated Centrifuge	Maximum speed : 14,000 rpm Maximum rcf : 21,800 g Temperature range : - 9°C to + 40 °C Display : Digital for speed, Temperature and time Timer : 0-99 Min and hold Mode Power : 220V/50Hz Other Features: ➢ At set rpm for even more reproducible results (timer should start when set speed is reached) ➢ Setting of rpm/rcf, time, and temperature

		➢ Frequency controlled induction drive system ➢ Automatic rotor recognition ➢ Acceleration and deceleration ramp ➢ Short spin & lid lock ➢ Values can be changed during centrifugation ➢ Fast temperature function for rapid cooling of the centrifuge chamber ➢ Imbalance cut-out ➢ Metal body for safety ➢ Built in condensation drain for corrosion free chamber. • Three year comprehensive warranty <u>Rotors</u> Fixed angle: 1. Capacity : 30 x 1.5/2 ml Maximum speed : 14,000 rpm RCF : 21,800 x g Adaptors for 0.2ml and 0.5 ml <u>Swinging Bucket for tubes and Micro titer plates</u> Capacity : 4 x 250ml Maximum speed : 4,000 rpm RCF : 3,220 x g Adaptors for 36 x 15ml, 16x50ml falcon tubes and micro titre plates. <u>Fixed angle rotor for 15/50 ml</u> Capacity : 6 x 85ml Maximum Speed :12,000 rpm RCF :18,500 x g Adaptors for 15/50ml Falcon Tubes At least 15 No's of Micro Tube Plate (MTP) and 4 No's of Deep Well Plate (DWP) should accommodate.
19	Thermal cycler (PCR / Master Cycler)	• Asymmetric independently controllable universal dual block • Block should accommodate PCR tube strips, 0.2 ml & 0.5 ml PCR tubes or divisible PCR plate • Technology should ensure identical ramp rates in both gradient and normal operation • Gradient temperature range from 30 – 99^0C • Heating and cooling of block must be through Peltier technology • Block temperature control range must be 4^0 C to 99^0C • Lid Temperature range: 37 - 110^0C • Block Temperature Accuracy: ± 0.2^0C • Block Homogeneity: ≤ ±0.3^0C (20^0C to 72^0C); ≤ ± 0.4^0C (90^0C) • Heating rate: 3^0C/s; Cooling rate: 2^0C/s • Should have large display with Intuitive Graphic programming • Auto Restart facility with user defined time interval when power fails and resumes • Display of instrument status indicating the step, cycle and remaining runtime during the run • Interface: USB, Ethernet, CAN in, CAN out • Calibration according to NIST (USA) or DKD/PTB (Germany) UKAS/NPL (UK) or UL/cUL listed • Should comply to RoHS (2011/65/EU)

		• Three year comprehensive warranty
20	Refrigerated Incubator cum Shaker	• Incubator Shaker should be front loading with one adjustable shelf in addition to shaking chamber. Should have the following specifications: • Speed Range: 25 to 400 rpm ± 1 rpm with microprocessor control. • Temp. Range: 20^0C below ambient to 80^0C (minimum set point is 4^0C) • Heater: Low-watt density resistance type heater with temperature safety cabinet. • Should meet CE standards • Internal Shelf: Should provide a stable surface for incubating samples not requiring shaking. • Unit should be supplied with universal platform (18"x 18") and system should accommodate clamps of various sizes 125ml / 250ml / 500 ml to 6L Erlenmeyer flask • Temperature uniformity should be: +/- 0.25^0C • **Other options :** • Ultraviolet germicidal light • Three year comprehensive warranty
21	(-) 80^0 C Ultra Low Temperature Freezer	• The Microprocessor Controlled Ultra low Temp. Freezer (Vertical type) should have the following features: • The capacity of 550- 600 litres • Programmable Temp range up to – 80^0C in increment of 1^0C, should work even at ambient temperature up to 40^0C (Preferable). • Digital display (LED). • The system should be capable of holding 40,000 samples of 2ml vials • Interiors should be made with anti- rusting / non corrosive material. • Heated air Vent with plunger to break icing and prevent vacuum formation. • Five Compartments with four adjustable height SS shelves (Preferable) • Door latch with Positive, single-handed cam action latch with lock. • The Freezer should have Audible and Visual Alarms facility for the indication of high and low temperature conditions, power failure, low battery and also Automatic Restart with non – volatile memory, return set points to user programmed levels after power interrupt. • Battery Backup for the alarms and temperature displays during power outages. Electronic Voltage Stabilizer of sufficient capacity. • Three year comprehensive warranty
22	- 20^0C Freezer	• **Vertical Freezer** • Capacity (In Litres) : 340 L approximately • Temperature range: - 17^oC to - 24^oC • Wheels : Yes (Rear) • Defrost: Auto Rated Load • Wattage: 140 • No. of Baskets/ Shelves:8

		• No. of Lids/ Doors:1 • Electronic Voltage Stabilizer of sufficient capacity • Three year comprehensive warranty
23	Gel Documentation System	• Gel documentation system for imaging DNA , RNA and protein gels. Should have motorized zoom lens with automatic control of the camera, lens and lighting for an unrivalled ease of use. • Dark chamber with full slide out UV trans illuminator on pull-out rails for comfortable work. • UV safety shutoff with widely accessible door to handle gels while placing or moving gels on trans illuminator table • Scientific grade, CCD camera is must with native image resolution of 2600 (H) x 1950 (V) yielding image resolution of minimum 5 megapixels. • System should be capable of producing images of 12-bit. • USB 3.0 interface for faster image transfer • Maximum field of view must be at least 26 x 21 cms • System should have 4-position filter wheel with F-590 emission filter for ethidium bromide, SYBR Green, SYBR Gold, Gel Red, Gel Green, Lumitein, SYPRO Ruby, etc. • System should have option for future upgradation for colorimetric gel imaging • System should be supplied with multi user licensed analysis software for image enhancement, image analysis includes molecular weight calculation, band quantification, distance calculation, etc. Complete flexibility with automatic detection of lanes and bands, using several algorithms • Should be provided with branded desktop- Intel I5 processor,1TB HDD, 4GB RAM, 21" LED monitor with multi-tasking all in one printer both colour and black and white output (20PPM, 1200 x 1200 dpi, 64 MB RAM, 1500 Pages starter catridge). • Three year comprehensive warranty
24	UV- VIS Spectrophotometer	• True double beam optics with aberration corrected concave blazed holographic grating in Czerny-Turner mounting for high energy throughput and high quality monochromatic light • Wide wavelength range of 190 nm to 1,100 nm • Microprocessor based UV-VIS Spectrophotometer with high resolution digital display and dedicated soft keypad, for operation on 220V / 50Hz. • Stand-alone operation or complete control through PC with UV-Probe PC software supplied as standard • High resolution 1 nm spectral bandwidth over entire wavelength range • Wavelength setting and display in steps of 0.1nm • Wavelength accuracy of + 0.1nm for D 2 spectral line • Wavelength reproducibility of + 0.1nm • Variable wavelength scanning speed of 3,000 nm/min to 2 nm/min • Ultra low stray light of <0.02 % T at 220 nm with NaI filter • Wide Photometric range of - 4 to +4 Abs and 0 to 400 % T • High Photometric Accuracy of + 0.002 Abs at 0.5 Abs • Dual source – high intensity Tungsten - Halogen and Deuterium lamp with automatic changeover • High sensitivity matched pair Silicon Photodiode detector • Built in validation program, diagnostic and security functions

		• All operational modes as standard - Photometric; Spectrum; Quantitation; Kinetics, Time Scan, DNA and Protein Quantitation in standalone and PC mode. Additionally Multi-Component measurement should be available in stand-alone mode. • Large sample compartment compatible with wide range of accessories • Compact design with small footprint • Quartz cuvettes of 2nos should be provided • Should be provided with branded desktop- Intel I5 processor, 1TB HDD, 4GB RAM, 21"LED monitor. • Three year comprehensive warranty
25	2 D Electrophoresis Unit	Input Power 100–240 VAC, 50/60 Hz Voltage 0.50–10,000 V, 1 V increments per lane Current 0–100 µA, 1 µA intervals per lane Power 0–1 W per lane **Peltier Platform** Tray capacity 1 tray Temperature 10–25ºC ± 0.5ºC @ max.ambient temperature 23ºC 15–25ºC ± 0.5ºC @ max.ambient temperature 31ºC **Focusing Trays** Material Polycarbonate IPG strip length 7, 11, 13, 17, 18, and 24 cm Capacity 1–12 IPG strips per tray Max. channel volume 7 cm: 7 ml; 11 cm: 10 ml; 13 cm: 11.2 ml; 17 cm: 14.2 ml; 18 cm: 15.2 ml; 24 cm: 20.2 ml **Rehydration/Equilibration Trays** Material Polystyrene IPG strip length 7, 11, 13, 17, 18, and 24 cm Capacity 1–12 IPG strips per tray Max. channel volume 7 cm: 6.8 ml; 11 cm: 9.6 ml; 13 cm: 10.5 ml; 17 cm: 14.2 ml: 18 cm: 16 ml; 24 cm: 19 ml Display QVGA resolution (320 × 240) touch screen or mouse control Programmable Yes Ramping - Step, linear, gradual, and hold voltage ramping used for each focusing step. Hold mode as a final step to prevent diffusion when focusing is complete Protocol capacity: 2 GB (storage of approximately 20,000 data and protocol files) Data collection .DAT file format Should have 12 independent lanes with independent control. Should provide PD quest basic analysis software along with system. **Electrophoresis Unit** Number of gels 1–4 Gel size (W x L) 18.3 x 20 cm (handcast) Glass plate size (W x L) Inner plate 20 x 20 cm Outer plate 20 x 22.3 cm Spacer length 22.3 cm Typical upper buffer volume 350 ml

		Typical lower buffer volume 1.2 L **Typical run times for SDS-PAGE** Without cooling 5 hr With cooling 3.5 hr Power Supply PowerPac HV or PowerPac Universal • Quote both Basic and Advanced 2-D Analysis Software • Three year comprehensive warranty
26	Nanodrop Spectrophotometer	• Minimum Sample Size: 0.5ul • Sample Number: 1 • Path length(s) : 0.05,0.1,0.2 and 1.0mm auto ranging • Light Source(s) : Xenon Flash Lamp • Detector Type: 2048 - element Linear Silicon CCD Array • Wave Length Range: 190-840nm • Wave length accuracy: $\pm$1nm • Spectral Resolution: $\leq$1.8 nm (FWHM at Hg 253.7 nm) • Typical Measurement reproducibility : 0.002 • Absorbance accuracy: 3 % (at 0.74 Abs at 350 nm) • Absorbance range: Pedestal : 0-300 Abs, Cuvette: 0-1.5 Abs • Lower limit of detection : Pedestal : 2ng/ul (ds DNA), 0.10 mg/ml (BSA), Cuvette: 0.4 ng/ul (ds DNA), 0.01 BSA • Maximum concentration: Pedestal 15000 ng/ul (ds DNA), 400 mg/ml (BSA) • Measurement time: < 5 seconds • Sample pedestal Material of construction: 303 stainless steel and quartz fiber • Cuvette position: Optional stirring : 150 – 850 rpm, Heating : 37 $\pm$0.5^{o}C, • z- height: 8.5 mm • Operating Voltage: 12 V (DC) • Operating power consumption: 12-18 W • Standby Power consumption: 5 W • Software Compatibility: inbuilt computer • Cuvette also to be provided • Three year comprehensive warranty
27	Laminar air flow bench system (4x2x2 ft) Horizontal	• Micro controller based • SS body • Quality tested approved HEPA filters of class 100 with an efficiency of 99.99%, Particle Retention: 0.3 Micron. • Cleaniliness: Class 100 • Hours meter for HEPA • UV light **Features** • SS bench top, acrylic shutter, germicidal lamp and fit with glass bead sterilizer of reputed make. Three year comprehensive warranty
28	Particle Gun	The System with the bombardment chamber (main unit), connective tubing for attachment to vacuum source, and all components (helium regulator, solenoid valve, and connective tubing) necessary for attachment and delivery of high-pressure helium. Construction Aluminum, ABS plastic, and acrylic chassis Electrical input voltage 100–120 VAC, 50–60 Hz

		Maximum current <5 A **Mechanical** Fuse 6.3 A, 250 V, 5 x 20 mm Vacuum <0.4 inches mercury/min leakage Overpressure 0.5 psi relief valve, self-resetting Environmental Operating Temperature: 0–35°C (32–95°F) Humidity: 0–95% noncondensing Storage Temperature: 0–70°C (32–158°F) Humidity: 0–95% noncondensing 500 Optimization Kit- includes 0.25 g each of 0.6 um, 1.0 um, and 1.6um, gold microcarriers, 100 each of 9 rapture disks, 500 macrocarriers, 500 stopping screens . An optimization kit should allow several experimental conditions to determine exactly the conditions that are optimal for cells Should include helium cylinder with regulator and vacuum pump, tool kit. Three years comprehensive warranty
29	ELISA Reader With Microplate Washer	**Specification for ELISA Reader** • Wavelength range 400–750 nm • Photometric range 0.0–3.5 OD • Linearity ≤1.0% from 0.0–2.0 OD; ≤2.0% from 0.0–3.0 OD • Accuracy ≤1.0% or 0.010 from 0.000–3.000 OD at 490 nm • Precision 1.0% or 0.005 OD from 0.0–2.0 OD; 1.5% from 2.0–3.0 OD • Resolution 0.001 OD • Filter wheel capacity 8 • Plate shaking (3 speeds) Low, mid, high • Duration, sec 0–999 • Read time 6 sec at single wavelength, 10 sec at dual wavelengths • Data output Onboard graphical thermal printer and USB2 interface with PC or Mac data stations and external printer • Data storage Calender/clock functions; 64 assay protocols **Specification for Washer** • Electrical • Voltage 200/100 VAC, 50/60 Hz **Physical** • Operating conditions 15–30°C, 15–85% relative humidity • Hardware • Manifolds 8- and 12-way • Vacuum Integrated vacuum pump, 9 L/min • Waste bottle volume 2000 ml • User interface Digital display 5 diaphragm keys flat keyboard Three years comprehensive warranty

30	Ultra centrifuge (floor model)	Operational Control Requirements 1. Maximum Speed: 100,000 rpm or more 2. Maximum RCF (x g): 800,000 or more 3. Speed Control: ±2 rpm of set speed 4. Set Temperature: 0 to 40ºC in 1ºC increments 5. Temperature Control: ± 0.5ºC of set temperature 6. Temperature display: Actual rotor temperature in 0.1°C increments 7. Ambient Operating Range: 10 to 35°C or more 8. Acceleration Profiles: 10 or more 9. Deceleration Profiles: 11 or more 10. User- Defined Programs: 1,000 with up to 25 steps each or better 11. User Profiles: 45 unique users and passwords or better 12. Sample imbalance tolerance: ±5 ml or 10% whichever is greater 13. Large touch-screen display with adjustable positions **Rotor Specific Requirements** **Fixed Angle Rotor:** i. Rotor Maximum Capacity: 8 x 39 mL ii. Rotor Maximum Speed: 70,000 rpm iii. Rotor Maximum Force: 504,000 x g iv. Rotor k-factor: 44 v. Material: Titanium • 50 Quick-Seal Polypropylene tubes of 33 mL capacity that can be run at 70,000 rpm and 504,000 x g should be supplied • 50 Quick-Seal Ultra-Clear tubes of 27 mL capacity that can be run at 70,000 rpm and 504,000 x g should be supplied **Swinging Bucket Rotor:** Rotor Maximum Capacity: 6 x 17 mL Rotor Maximum Speed: 32,000 rpm Rotor Maximum Force: 187,000 x g Rotor k-factor: 228 Material: Titanium • 50 Quick-Seal Polypropylene tubes of 4.2 mL capacity that can be run at 32,000 rpm and 187,000 x g should be supplied • 50 Quick-Seal Polypropylene tubes of 10.0 mL capacity that can be run at 32,000 rpm and 187,000 x g should be supplied • **Fixed angle** Titanium rotor with adaptors 8 x39 ml • **Swing bucket** rotor 6 x 17 ml with adaptors • Three years comprehensive warranty
31	Tissue Lyser/ Macerator	• High speed shaking of samples in 2 ml microcentrifuge tubes with stainless steel or glass beads • Simultaneous disruption of up to 12 samples. • Compact instrument with small footprint. • Coolable adapter to prevent bio-molecule degradation. • Reproducible results with all sample types. • Compatible with all laboratory workflows. • Three years comprehensive warranty
32	Digital Droplet PCR	Droplet Digital PCR Specifications • Starting sample size 20 µl • Automated Droplet Generator capacity 1–96 samples/run

		• Droplets per 20 µl sample 20000 • Droplet Reader capacity 1–96 samples • Sample illumination Light-emitting diodes • Sample detection Multi-pixel photon counter • Detection channels FAM (EvaGreen), HEX VIC), etc • Linear dynamic range 5 orders of magnitude • Precision ±10% • Droplets per 96-well plate, million ~1.5 • dPCR System should combine water-oil emulsion droplet technology with microfluidics. • It provides a measure of target DNA molecules with unrivaled precision, accuracy, and sensitivity. • The system partitions each sample into 20,000 uniform nanoliter droplets containing target and background DNA in a random distribution. • Quote for both basic software and advanced software • Three years comprehensive warranty
33	Freezing Microtome	• Section thickness setting 0.5 to 300 µm • Maximum specimen size 40 mm x 55 mm • Horizontal specimen feed 25 mm • Vertical specimen stroke 59 mm • Specimen retraction 50 pm • Specimen precision orientation by 8^0 (x/y/z axis) • Trimming 5 to 150 µm ± 0,5 µm in steps of 5, 10, 30, 50, 100, and 150 µm • Motorized coarse feed at two speeds 500 µm/s 1,000 µm/s • Cutting Motor Cutting speed ranges 0.1 mm/s to 170 mm/s 0.1 mm/s to 100 mm/s Vmax 210 mm/s • Cryochamber Cooling via separate refrigeration system Temperature setting range 0^0C to - 40^0C • Defrosting programmable 1 automatic defrost cycle/24 h duration: from 6 to12 min; manual defrosting • Freezing shelf temperature Approx. - 43^0C at an ambient temperature of 22^0C • Specimen Cooling (optional) via separate refrigeration system • Temperature setting range -10^0C to -50^0C (+/-3 K) • Three years comprehensive warranty
34	Millipore with RO	Ultrapure (Type I) Product Water Quality • Resistivity: 18.2 MΩ.cm @ 25 °C • TOC (UV system with 185/254 nm UV lamp): < 5 ppb [Feed water < 30 ppb] • Particulates (size > 0.22 µm), < 1 Particulate/ml • Microorganisms:: < 1 cfu/ml • Flow rate (with membrane filter): > 1 lit/min • Should be provided with suitable RO system (<100uS/cm) with storage tank of sufficient capacity (PE tank) to feed above unit to get Type 1 water • Should be installed with pressure regulator to monitor water pressure • Three years comprehensive warranty

35	Plant Growth Chamber with CO_2 control kit	**Volume:** Min volume required – 1000 L or more **Control Features**: • Control system should be capable of Real time clock programming of temperature, relative humidity and lighting status. • One schedule should have minimum of 8 programs and that can be repeated from 1 to 99 times or be programmed to an infinite loop. • Screen: Monochromatic with LED back-lighting. • Experiment protection via temperature limit shut-down. Auto-restart when temp inside is normal. • Temperature low and high deviation alarm. • Auto restart in case of power failure with inbuilt battery. • Controller should be capable of user-set high and low temperature and RH protection alarms. • Alarm History of at least last 15 alarm events should be stored. **Lighting:** Each tier of Shelf lighted by properly horizontally / vertically placed florescent lamps to have balance light spectrum and uniform light distribution over entire shelf. • Intensity programmable maximum 500 µmoles/m2/sec of light irradiance measured @6" from lamps on each tier. **Temperature Control:** • Range: +4°C to +40°C lights OFF and +10°C to +45°C lights ON • Control: ±0.5°C, at control point. • Temperature setting accuracy 0.1°C. • Growth Height in each tier: 16-18" growth height or more should be available on each of the two tiers. • Growth Area: Growth area of 10-11 square feet or more should be available for total two tiers. • Shelving: Minimum two adjustable tiers and two height adjustable powder coated steel wire shelves should be provided. • Cabinet Construction: A. Exterior Finish: Powder-coated steel. B. Interior Finish: Reflective white, powder-coated stainless steel for corrosion resistance, long life, ease of cleaning and maximum light uniformity. • Refrigeration: Self contained air cooled condensing unit with hot gas bypass system for continuous compressor operation, extended life and closed temperature control • Relative Humidity: 90% RH when Light-ON: Additive humidity through use of ultrasonic humidifier should be available. • At least 10 installations of quoted Model in India installed. Performance certificate from at-least 10 users of Plant growth Chambers to be provided • User's list with original catalogue to be provided. • Manufacturer should be ISO Certified Company. Documentary proof to be provided • CE certified • Accessories: Suitable stabilizer to be provided along with the machine. Suitable UPS for growth chamber to be provided along with the machine. Suitable RO for Humidity to be provided along with the machine. • Quote CO_2 additive kit- Portable systems separately • Three years comprehensive warranty

36	Horizontal Electrophoresis unit	Horizontal Electrophoresis unit - Single molded buffer tank 1.MINI GEL UNIT : Mini Horizontal Gel Unit 7 X10 cm each, Includes Complete Buffer Chamber Assembly, Safety Lid with High Voltage Leads, Running Tray, Casting Tray, Foam Gaskets 4 Pcs, Spirit Level, Comb 1.5 mm thick, 8 wells. 2. MIDI GEL UNIT : • Midi Submarine Gel Unit 12 x 15 cm each, Includes Buffer Chamber Assembly, 1 mm thick, 16 well combs–2 pcs, Safety Lid, Colored Loading Strips, High Voltage Leads, Buffer Recirculation Ports–2 pcs, Casting Gates/ running Tray W 3.MAXI GEL UNITS : • Standard Submarine Gel Unit 25 x 30cm or better each, Includes: Buffer Chamber Assembly, 1 mm thick, 26 well combs–6 pcs, Safety Lid, Colored Loading Strips, High Voltage Leads, Buffer Recirculation Ports–2 pcs, Running Tray W/Casting Gates , • Quote different comb sizes and casting trays for above three models separately 4. BASIC POWER PACK: • Display: LED • Output voltage :2 - 300V / 1V • Output current :1 - 700mA / 1mA • Output power :150W • Output type: Constant voltage / Current • Controller: Microprocessor controller • Terminal pairs: 4 Pairs • Timer: Constant mode:999 (min) with alarm / Continuous • Safety device : No-load detection, Leakage detection • Sudden load change detection, Over temperature protection • Overload detection, Shrouded plug and sockets • Rated voltage: 100V - 240V • Three years comprehensive warranty
37	Vertical Electrophoresis unit	Vertical electrophoresis – Single molded buffer tank MINI GEL UNIT - Number of gels 1–4 • Gel size (W x L) - 8.0 x 7.0 cm • Glass plate size • Gel casting unit • Combs • Short plate 10.0 x 7.0 cm • Spacer plate 10.0 x 8.0 cm • Total buffer volume for 2 gels 700 ml • Total buffer volume for 4 gels 1,000 ml MIDI GEL UNIT - Number of gels:1–2 • Gel casting unit • Combs • Gel size (W x L): 13.0 x 8.0 cm • Gel thickness:1.0 mm • Total buffer volume:1 L MAXI GEL UNITS - Number of gels: 1–2 • Gel size (W x L): 18.0 x 20 cm • Gel casting unit • Combs

		• Spacer length: 22.0 cm • Typical upper buffer volume: 350 ml • Typical lower buffer volume:1.2 L • Provision to connect to chiller for cooling • Quote combs of various sizes and glass plates and stand under optional POWER PACK • Display: LED • Output voltage :2 - 300V / 1V • Output current :1 - 700mA / 1mA • Output power :150W • Output type: Constant voltage / Current • Controller: Microprocessor controller • Terminal pairs: 4 Pairs • Timer: Constant mode:999 (min) with alarm / Continuous • Safety device : No-load detection, Leakage detection • Sudden load change detection, Over temperature protection • Overload detection, Shrouded plug and sockets • Rated voltage: 100V - 240V • Three years comprehensive warranty
38	Real Time PCR	• Maximum ramp rate: 5°C/sec • Average ramp rate: 3.3°C/sec • Heating and cooling method: Peltier • Temperature Range: 0–100°C • Accuracy: ±0.2°C of programmed target at 90°C • Uniformity: ±0.4°C well-to-well within 10 sec of arrival at 90°C • Gradient-Operational range: 30–100°C • Programmable span: 1–24°C • Optical Detection -Excitation 6 filtered LEDs -Detection 6 filtered photodiodes • Range of excitation/emission wavelengths: 450–730nm • Sensitivity: Detects one copy of target sequence in human genomic DNA • Dynamic range 10 orders of magnitude • Scan Time -All channels: 12sec -FAM/SYBR Green only: 3sec • Software including HRM analysis • Peer reviewed application with five color multiplex • Operating systems: Windows 7/ Windows 8 Multiplex analysis: Up to 5 targets per well • Licensed for real-time PCR • Sample capacity: 96 wells • Sample size: 1–50 µl • Communication interface: USB 2.0 • Electrical approvals: IEC/ CE • Should be provided with branded desktop of I5 processor, 4GB RAM, 1TB HDD, 21”LED monitor **Open consumables and reagents** Three year comprehensive warranty

39	DNA concentrator	• Machine should be Chemical-resistant • PTFE diaphragm pump • Machine chamber Chemical-resistant stainless steel chamber • Machine should have Extremely quiet operation, even with pump turned on • Following features should be there in machine with three application modes (aqueous, alcohol, or high vapour pressure) to correspond with sample solvent → reduction of processing time up to 20% • Machine should have four heating levels (room temperature, 30^0C, 45^0C, 60^0C) allows safe and efficient concentration of various samples • Machine should perform Centrifugation and Desiccator function • Should have rotor of minimum 48X1.5/2ml,6x15ml/50ml • Machine should have fixed rotation of 1400 rpm or better • Should support volumes for 0.5mL to 50ml ,and should have max capacity of 144 Tubes ,2Microplates • Should generate vacuum of 20 hpa (hecto pascals) • Max power consumption should be 350W • Three year comprehensive warranty
40	Electroporator	• System Should Include main unit, CE module, PC module, and cuvette chamber • Outputs Waveform: Exponential or square Voltage: 10–3,000 V • Capacitance 10–500 V, 25–3,275 µF in 25 µF increments 500–3,000 V, 10, 25, 50 µF • Resistance (parallel) 50–1,000 Ω in 50 Ω increments, plus infinity Sample resistance 20 Ω minimum at 10–2,500 V 600 Ω minimum at 2,500–3,000 V Square-wave timing 10–500 V: 0.05–10 ms in 0.05 ms increments, 10–100 ms pulse in 1 ms increments, 1–10 pulses, 0.1–10 sec interval 500–3,000 V: 0.05–5 ms in 0.05 ms increments, 1–2 pulses, 5 sec minimum interval **General** Input voltage 100–120 VAC or 220–240 VAC, 50/60 Hz Power Maximum 240 W (during short charging periods) Operating environment Temperature 0–35°C, humidity 0–95% (noncondensing) Regulatory Safety EN 61010, EMC EN 61326 Class A Three Years Comprehensive warranty
41	10KV UPS	Single phase input for 10KV UPS • Full Digital Signal Processing using the latest DSP technology • Parallel operation for Redundancy • Wide Input Voltage Range • Low Current Harmonic Distortion of less than 5% • Unity Input Power Factor • High Overload and Short-Circuit Capacities

		• Compatible with Engine Generators • High Reliability for Maximum System Availability • Handles 3:1 Crest Factor Loads • Intelligent Battery Management • LCD Display and Mimic Panel for Real-time information • Output Isolation between UPS and Critical Load • Temperature compensated Battery charging to enhance the Battery life • Battery test facility • Inverter output short circuit protected • Rectifier output short circuit protected • Reverse Phase sequence operation • Auto retransfer facility • Alarms can be stored in the memory • DSP and Dual microprocessor based system • 2hour backup- 12V,100Ah Amaran quanta SMF batteries to support 10KV . 3 years Comprehensive warranty
42	20KV UPS	Three phase input for 20KV UPS • Full Digital Signal Processing using the latest DSP technology • Parallel operation for Redundancy • Wide Input Voltage Range • Low Current Harmonic Distortion of less than 5% • Unity Input Power Factor • High Overload and Short-Circuit Capacities • Compatible with Engine Generators • High Reliability for Maximum System Availability • Handles 3:1 Crest Factor Loads • Intelligent Battery Management • LCD Display and Mimic Panel for Real-time information • Output Isolation between UPS and Critical Load • Temperature compensated Battery charging to enhance the Battery life • Battery test facility • Inverter output short circuit protected • Rectifier output short circuit protected • Reverse Phase sequence operation • Auto retransfer facility • Alarms can be stored in the memory • DSP and Dual microprocessor based system • 2 hour backup-12V,100Ah Amaran quanta SMF batteries to support 20KV UPS 3 years Comprehensive warranty
43	HPLC	• High Pressure binary gradient Integrated two pump System . • The machine should be operable both in isocratic and gradient mode • The flow rate should be within a range from 0.001 to 20 ml/min or more with the possibility of increment of 0.01 ml/min for carrying out semi-preparative applications. • Flow Precision: ≤ 0.1% RSD or better. • Flow Accuracy: ± 1.0% or better • Delay Volume : <200µl (with Gradient Mixer). • Operating pressure: 6000 psi or better. • Flow Calibration: Programmable .

		• Gradient Composition Accuracy : ± 0.5% • Gradient Composition Precision : ± 0.5% • The pump should be corrosion resistant and applicable to wide range of pH and solvents. • Should have option for programming for fast & slow gradients to separate eluted peaks at close proximity. • Should have possibility to operate in various gradient curve mode including Liner, Step, concave, convex etc. Manual Injector • Should quote manual Injector with 5, 20, 50, 200ul loops PDA Detector • Detector should have wavelength range of 190-800 nm or more with wavelength accuracy of +/- 1 nm • Wavelength Repeatability: ± 0.1 nm • Should be operable at high resolution mode (resolution : 1.2 nm per photodiode) with a total of more than 512 Photo diodes, digital, and optical (3D mode) • Should be operable at noise level 0.6x10-5 AU at 254 nm or better • Data Acquisition : Up to 80 Hz or better • Path-length : 10 nm or better • Flow cell Design and cell volume-10 µL or better and should have minimum RI effect • Pre-aligned deuterium and tungsten lamps should be used as light source, (dual lamp design required for optimum sensitivity) with minimum life of 2000 hrs or more • It should have integral cuvette holder for using as a qualitative bench top spectrophotometer • Should have provision to control peak purity using software • Data Acquisition: Up to 80 Hz • Should have provision of low noise performance within the operable wavelength range without lamp change. Fluorescence Detector: 1. It should have excitation wavelength range between 200-890 nm and emission wavelength range between 210-900nm 2. It should have band width of 20 nm and wavelength accuracy of ±3 nm 3. It should provide sensitivity > 1000 (Raman Spectrum of H2O) Cell volume should be <10 micro litre 4. Detector leak sensor is preferable 5. Detector should have pressure limit between 100 to 400 psi 6. Flow cell design should be Axially illuminated 7. Light Source: Hg/Xe arc lamp 8. It should provide flexibility for 2D & 3D data operation simultaneous. Chromatography Software: • The software should be original, authenticated and compliant for GLP/GMP/CFR. • Software should Embedded with Oracle data base.

		• Should have option for manual Integration • Should have option for versatility for multitasking without multiple software packages • Customizable data reports, online help and answer wizards. • Should have option for data integrity along with advanced security measures • The software should have option for maintain security and regulatory compliance Columns: • Sun Fire C8 5µm 4.6x250mm Column and optional accessories should be quoted under optional. 3 years Comprehensive warranty
44	Triple Tandem Quadrupole LC-MS/MS	A Bench Top High sensitive Triple/Tandem Quadrupole LC/MS/MS System for pesticides residues, analysis with software to meet global food safety regulations like EU/ USFDA/Japan with following specifications. The UPLC must be a microprocessor controlled, with extensive self diagnostics and can be operated by an external PC through chromatography software besides the following configuration and specifications. Liquid chromatograph and the MS/MS should have been manufactured by the same company or LC and MS.MS from different manufacturers should have a high degree of compatibility and operational with the same mass software, and a written assurance from the competent authority of the manufacturing /supplying company to that effect and **provide one stop after sales servicing**, besides certifying that they will honour the bid conditions of 3 years warranty and 5 year AMC without any delay in servicing, replacing and maintenance of entire unit **The customer satisfaction certificates should also be submitted to the effect that there is no problem in compatibility and after sales service of the entire set of equipments , from at least three current users**. **The Pump**: • should be a binary solvent delivery pump and Capable of switching between four solvents • should have a minimum of Eleven (11) gradient curves (including linear, step (2), concave (4), and convex (4) • should deliver constant and pulse free solvent ranging from 0.01ml to 2.0 ml/min with a precision of 0.075% RSD or better. • Should meet a flow accuracy of +1% or 10 ul/min, which ever is greater. • should have an operating pressure range of 0 to 15,000 psi up to 1ml/ min and 9,000 psi up to 2ml/min or better. • the solvent delivery should provide a retention time reproducibility of less than 0.3 RSD • should have the ability to maintain the custom defined/programmed solvent composition at all flow rates/pressure ranges, in increments of 0.1% • should have a composition accuracy of +0.5% absolute, independent of backpressure. • Should have the facility to calibrate the flow and readjust the real time flow values.

		• Should have the mechanism for auto purging • Should have the facility to monitor the pump status like flow, pressure etc., **In line degasser**: An integrated degasser with six channels , - one channel per solvent and 2 channels for sample manager was solvents. to de gas in line of all the solvents be supplied which works continuously and efficiently Column Oven: Thermostatically controlled **Column oven**: Thermostatically controlled Column Oven to accommodate up to 150 mm Column, preferably a microprocessor based. Oven should have been calibrated by NABL/ ISO 17025 – 2005 accredited laboratory. • should have a range of ambient to 650 C or better • should have control range setting of 0.1 o C increments. • should have a tracking of information via e Cord data storage device.. **The Triple quadrupole MS-MS detector :** • The system sensitivity should meet EU- MRLs for pesticide residues in fruit and vegetable matrix.(Proof document /application note to be enclosed along with technical tender document) • Triple/Tandem Quadrupole MS/MS System with facility to connect Ultra Performance Liquid Chromatograph using sub 2 um particle size columns for high sensitivity trace level analysis. • **Mass Range (AMU)**: Minimum 5-2000 amu • **Scan Speed** : should have the scan speed of 10000 amu /sec or above • **Interface**: Dual orthogonal source or equivalent interface in order to eliminate the neutrals entering in to mass, capable of handling large batches of complex sample matrix Dual orthogonal source capable of handling large batches of complex sample matrix like Agriculture products(Fruits & Vegetables) Animal feeds, egg powder ,milk products, cereals and food materials over a long period of time without performance degradation, **The cleaning of the source should be done without venting the system and facility to Vacuum Interlock**. • **Vacuum System**: A robust high efficiency vacuum system with minimum maintenance and utility with low noise level. • Vacuum read backs and system vent/pump cycles must be digitally monitored and controlled, to provide total software control and to ensure fail-safe operation in the event of power failure. A turbo pump must be fitted with an electromagnetic vent valve. • **Quadrupoles**: having high standards of mechanical tolerances and minimum• coefficient of Thermal expansion to ensure highest mass stability with Pre aligned pre and post filters to ensure excellent focusing of Ions into all the Quadrupoles for high sensitivity and resolution in both Q1 and Q3. • **Resolution**: Better than unit mass IE M/δM≥ M, FWHH (Full Width Half Height) less than 0.7+0.1amu Over the entire mass range in both Q1 and Q3 Quadrupoles • Sensitivity: Femtomole Detection Limits and Highest Sensitivity. ESI+VE, MRM, Reserpine (M/Z609 M/Z 195)= 1000:1 (5 PG Injected)In ESI-VE,5pg of chloramphenicol (MRM 321>152)=180:1

		• **Collision Cell**: Specially designed collision cell to allow use of very low DWELL Times (5 milliseconds) without sacrificing sensitivity and Eliminate Cross-Talk to enable Multiple MRM Transition Studies within a single run. • **Should be capable of fast data collection of 100 data points per MRM transition for• better quantization and minimum cross talk of 0.01%.** • Collision gas must be controlled using digital mass flow meters. Collision gas introduction, pump out and regulation must be under full data system control. Collision gas pressures and flows used during data acquisition must be automatically appended to the relevant data file. • **Dynamic Range**: 5 orders of dynamic range • **Choice of Different Sources to cover all areas of Applications**. • **Electro spray Ionization** – Pneumatically assisted Electro spray with Concentric Gas Flow for Nebulisation to cover flow rates from 2ul/min. to 200 ul/min. without Split/ Heating and up to 1ml with either split or heating. • Atmospheric Pressure Chemical Ionization Source • **Multimode Ionisation : ESI / APCI combined source** : A combined ESI/APcI source must be provided as standard with the instrument. ESI and APcI ionisation must be achieved using a single probe. It should able to perform both ESI and APCI in a single run with 20ms switching capability. • **Integrated Fluidic Device** : An infusion device must be integral to the instrument and must• be controllable from the instrument software. At least 2 user-changeable sample vials should be built into the system to allow tuning and calibration solutions to be infused into the probe via the switching valve. • **Operating Modes**: Tandem mass spectrometry should have following scan options a. Full scan b. Selected ion monitoring/recording (SIM/SIR) c. Product ion scanning d. Precursor ion scanning e. Neutral loss/gain scanning f. Multiple reaction monitoring • **Detector** : Off axis dynolite photomultiplier detector (Triple Quadrupole (tandem) mass spectrometer **or equivalent electronic multiplier detector with an additional security deposit of Rs.12,00,000/(Rupees twelve lakhs only) may be deposited for 10 years and (the interest on this additional security may be taken by the bidder). & also undertake to replace the electronic multiplier detectors till 10 years, free of cost. Willingness should be submitted along with the tender document. And it will be a qualifying criteria in the technical bid it self**. The instrument must incorporate an off-axis dynolite photomultiplier detector, positioned after the second mass analyzer in its own vacuum enclosure. The detector must have a digital dynamic range of 4 e 6 . The detector must operate in both positive and negative ion modes and must be capable of switching polarity rapidly under digital control. • **Nitrogen Generator**: A Nitrogen generator of more than 30

		Lrs/min capacity along with external compressor with **3 years warranty** period should be supplied. **Computer Platform**: The personal computer with latest processor/configuration with LCD monitor and Laser jet Printer should be supplied along with the instrument. The latest software which is compatible with the chromatography/MS/MS software preferably with oracle data base should be supplied. • Automated Calibration and Quantitative Optimization. • Automated MS to MS/MS Switching during a single run with user selectable criteria. • Perform Alternating POS/NEG Scans in one run within 20 ms • Automated Quantitation and reporting of acquired samples. • **Targeted, quality control quantification software** • Application software for quantitative applications having the additional requirement of Quality Control (QC) checks to satisfy statutory or regulatory requirements must be available. • This application manager must compatible with LC/MS and LC/MS/MS data. Data can be full scan, SIR/SIM or MRM. • Data Acquisition, Peak Integration, Calibration, Quantification and QC calculations must be fully automated. • Quantification and QC parameters must be stored for each compound and individually selected and loaded into new methods. • The quantification method editor must be viewable in page view or as a spreadsheet • **This application manager must allow the monitoring of the molecular ion plus up to 4 confirmatory ions.** • This application software must flag samples in the a browser report when: (a) the ion ratios fall out-with the user-defined values (b) the maximum blank acceptance level (user input) has been exceeded (c) the maximum concentration limit (user input) has been exceeded (d) the concentration is below the reporting concentration limit (user input) (e) the concentration falls below the minimum recovery % level (user input) (f) the concentration falls above the maximum recovery % level (user input) (g) the coefficient of determination for a calibration curve falls below a user-set level (h) QC samples fall outside a user-defined number of standard deviations from the mean (i) the peak of the compound of interest falls below a user defined S/N ratio • Software should have the database of around 500 pesticides. • Pesticide database should contain Molecular formula, Mono isotopic mass, Parent ion, Cone voltage (V), Product ion 1, Collision energy(e V), Product ion 2 , RT and sensitivity. **Technology for system optimization and status monitoring, technology should monitor and perform the following parameter** • System parameters checking and alerts • Integrated sample/calibrate delivery system and programmable divert valve

		• Automated mass calibration • Automated sample tuning • Automated SIR and MRM method development • LC/MS system checks-automated on-column performance test. **Auto Sampler**: An integrated auto sampler which can be operated through the same software of LC with the following specifications. • Should have a sample holder to accommodate a minimum of 768 samples and preferably with an expansion facility in future. • Should have the facility to inject multiple injections per sample , (1-99) • Should have a sample injection range from 0.5 ul to 50 ul with an increments of 0.1ul and different standard size sample loops also be supplied. • Should have a sample delivery precision of less than 0.3% RSD ,full loop. • Should have an injector linearity of more than 0.999 coefficient of deviation in partial loop mode from 2 to 10 ul. • Should have two wash solvents available through the binary solvent manager. • Should not have a sample carryover more than 0.005.% or 2 nl, whichever is greater **Columns**: The following columns may be supplied along with the instrument 1. Silica column 150mm X 4-6mm id, 1.7 mic 1no. 2. C18 column 150mm X 4.6mm id, 1.7mic 2nos. **Guard Column**: Suitable guard column sets (2 no s) with C18 inserts should be supplied along with the instrument. **Solvent filtration kit:** All glass solvent filtration apparatus with suitable filter membranes to filter aqueous and organic solvents should be supplied. **Vacuum pump**: Vacuum pump must be a dry/PTFE coated diaphragm based, operational under 220V/50Hz and constructed with chemical resistant materials. Should have an out put vacuum of 800 mm Hg , or better Should have pressure gauge/ monitor **Ultrasonic bath**:The Ultra sonic bath must accommodate up to 3 liter flask with a thermostatic controlled heater facility . **An uninterreptable power supply system of 10 Kv capacity with 2 hours backup supported by maintenance free sealed batteries should be supplied along with the system**. **Data Handling Software and PC** : • The personal computer with latest processor/configuration with LCD monitor and LaserJet Printer should be supplied along with the instrument. The latest software which is compatible with the chromatography/MS/MS software should be supplied. • A Original windows latest software which is compatible with the MS-chromatography software be supplied with the system. • The chromatography software should be of latest of its version and be able to collect the data from two Detectors simultaneously . • The software should have all the features required for audit trail under GLP/GMP with a password locking facility. **Other conditions**: The specifications are only a guide line and the supplier is at liberty to quote the better options also, but the Instrument model should have been brought in to the market recently with a proven

		record whose working demonstration can be arranged within the town in a short notice. • The manufacturer should have installed already a minimum of five such systems in India, with good track and provide references to that effect. • should have a three years warranty period for the equipment including the pc and should be willing to undertake AMC for five years after warranty period. Quotation for AMC (for five years with and without spares separately) should be shown under a separate head in the price bid The manufacturer/supplier preferably provide support with required spares and services for a minimum period of ten years of the model of the instrument quoted. All the required accessories should be supplied along with the instruments for its optimum performance. The cost of the consumables during warranty period may be quoted along with main bid. • The manufacturer/ supplier should have their presence in India by way of supplying and providing after sales service of their instrument including the annual maintenance after the guarantee period. • The manufacturer/supplier should arrange the training program in India for at least two analysts in operation of the instrument, its simple maintenance as well as thoroughness in application of software either at CIC, Agricultural College, Bapatla. **Important Note**: *The Instrument supplier must be either the original manufacturer or their authorized distributor/dealer and an authorization letter to that effect must be enclosed along with the quotation in case of latter.*
45	Trinocular Fluorescence Microscope with camera	Microscope should be with Infinity corrected optical system. Should have Three ways Trinocular tube (100:0, 20/80, 0:100), inclined at 30 degree with Field of View 22mm. 10X Eyepieces pair with diopter adjustment. Seven position Revolving DIC Upgradeable Nose piece & Universal Condenser for Bright field/Phase Contrast & Dark field up to 40X. Objective Lenses 4X,10X,20X,40X Plan Achromat 100X oil Plan fluorite. Rectangular mechanical stage with double slide holding capacity. LED or 12V-100 Watt Halogen lamp Pre-centered. The objective lenses should be useful to both BF/DF/PC/Fluorescense applications FLUORESCENCE ATTACHMENT: Fluorescence illuminator with six or more position Fluorescence Turret, 100 Watts System Mercury burner/LED lamp based, Neutral density filter, Power cord, Filter cubes for Blue, Green, YFP and DAPI. Scientific Digital Color Cooled CCD camera For Fluorescence Application with software: Scientific CCD Camera - FAST USB3.0, Monochrome, 14-bit, Thermoelectric cooling -100 C absolute or better, 2.8MP or better camera, 30 Frames per Second at full resolution, Binning option. Peak Quantum efficiency of 65% or better at 600nm. Dark Noise 0.0005 e/p/s . Software for image capturing and measurements. Should be provided with branded desktop of I3 processor, 4GBRAM, 1TB HDD, 21inch LED monitor

		Quote superior lenses and filters for exclusive fluorescence applications under optional. 3 years Comprehensive warranty
46	Trinocular Stereo Microscope With Camera	7:1 zoom microscope body, Galilean type optical system, with a magnification range of 8x-60x , Zoom drive: Horizontal knob system for each zoom magnification: ON-OFF switching possible Zoom ratio (Zoom magnification indication: 0.8, 1, 1.25, 1.6, 2, 2.5, 3.2, 4, 5, 5.6 or more) . Objective mounting: Screw mounting into thread. Objective resolution 300 lines/mm.30 degrees inclined trinocular observation tube, F.N. 22, Light path selection 100:0 20:80 .Widefield eyepiece 10X/22, focusable. Objective 1X, NA 0.1/WD 90 mm . Transmitted and reflected light LED illuminator stand Corresponded to RoHS, thin design to keep sample positions low and to optimize operability. Simultaneous transmitted and reflected light are available on this stand. Microscope Image Projection System complete with High Resolution 5-Mp, 1/2.5" USB CMOS Color Camera and with in-built widefield optical microscope adapter & with inbuilt USB connectivity , software to capture images. Should be provided with branded desktop of I3 processor, 4GBRAM, 1TB HDD,21inch LED monitor . 3 years Comprehensive warranty
47	Transmission Electron Microscope	1. Electricity supply: The TEM should be able to operate on a single phase 220 / 240V 2. Accelerating Voltage: 40 (or even lower) to 120 KV with adequate stability and facility to change the operating voltage (minimum step rise in voltage should be mentioned). 3. Filament: A tungsten or LaB6 filament is required with easy filament replacing technique. High brightness should be achieved at low filament current. 4. Vacuum System: The evacuation of the TEM system should be done preferably by turbo-molecular pump backed by Rotary pump for oil free contamination observation. 5. Specimen chamber: Entry to the stage should be by a side entry goniometer with specimen holder. 6.Stage: X and Y ± 1 mm Z ± 0.3 mm Tilt of 700 or more. 7. Resolution: Lattice image 0.2 nm or better Point image 0.38 mm or better 8. Magnification: Magnification range should be 600,000x or more. 9. Specimen holder: Should be quick change type with side entry and ability to hold at least 1 grid at a time. 10. Photography: Screen camera (1 mega pixel) and main camera (8 mega pixel) for image capture. A Bottom housing CCD camera having resolution 8MP for image capture in digital mode with necessary software should be provided with TEM. Complete integration of cameras with TEM unit is essential 11. Imported cooling water circulator (Chiller) of standard make 12. Computer: Having latest configurations with necessary hardware and software (preferably include 3D tomography) required for TEM image capturing, storage, measurement and analysis. 13. The microscope should be with a self-diagnostic function and should have an in built emergency trip off facility

		14. Installation: The Company will be responsible for complete onsite installation of microscope along with its accessories and fittings. 15. Accessories with the system a) Online 10KVA UPS with 1 hour backup for TEM b) Online 5KVA UPS with 1 hour backup for Cooling Water Circulator c) High vacuum carbon evaporator 16. Training: The Company should provide onsite training for one personnel after installation and commissioning of the equipment for which schedule/number of days will be discussed and decided for day to day operation and trouble free working of the TEM. 17. Spares / Consumables: Consumables for the Transmission Electron Microscope like filaments, apertures, O rings, fuses etc sufficient for five years should be supplied with basic TEM unit (list should be provided). Spares should be made available for ten years 18. Warranty: The quoted equipment should be offered with 3 years comprehensive warranty. 19. AMC should be quoted for next 5 years or on yearly basis
48	Scanning Electron Microscope With EDS	1. Electron Microscope type: Variable Pressure Scanning Electron Microscope on 220 volts, 50 Hz AC Power 2. Resolution: 3 nm at 30 KV (High Vacuum mode) or better 7 nm at 3 KV (High Vacuum mode) or better 4 nm at 30 KV (Low Vacuum mode) or better 10 nm at 5 KV (High Vacuum mode) or better 3. Acceleration Voltage: 0.3 to 30 KV 4. Magnification: x5 to x 300,000 or better photofilm dependent 5. Vacuum Range: 6-650Pa or better, 6. Detectors: a) Secondary electron detector b) High sensitivity 5-segment Semi-conductor type Backscattered electron detector. 7. Vacuum System: fully automated Evacuation system consisting of Turbo molecular pump and Rotary pump 8. Filament: Factory Pre-centered cartridge tungsten filament or LaB6 filament 9. Eucentric five axes (XYZR and T) stage to accommodate specimen size 100 mm dia or better and 70 mm height or better. Stage motorized (specify the number of axes motorized) Axes movement XYZ 50 mm or more 10. Control System: PC control with manual over ride through control panel/ Rotator knobs 11. Software feature: multi-user software with GUI, instrument status display, Montage navigation, report edition. 12. Auto functions: Auto Gun Control, Auto Beam Alignment, Auto Focus, Auto brightness and contrast, Auto Stigmator and Auto Focus compensation for probe current variation, auto start, Auto photo mode and full auto mode and Auto axial alignment. 13. Image Display: 2 or 4 Images, should be capable of displaying composition and topography images 14. Image Resolution: up to 5120 x 3840 pixels or more 15. Computer with operational software and colour laser printer and monitor (min 24") 16. Suitable capacity online UPS with 1 hour back up

		17. Sputter coater with Gold target and Carbon coating attachment 18. EDS with interface accessories. Detector size 10 mm2 or more with crystal area, high quality SDD, Resolution:129 eV or better, liquid nitrogen free free operation, The elements detection range should be from Boron (B) to Uranium (U) The EDS should be capable of x-ray element mapping, digital line elemental scan, selected area analysis, quantitative and qualitative analysis, multipoint analysis 19. Spares / Consumables: List of consumables like filaments, apertures, O rings, fuses etc for the SEM sufficient for five years should be supplied with basic SEM unit (list should be provided). Spares should be made available for 10 years. 20. Optional: Cooling stage unit for SEM 21. Training: The Company should provide onsite training for one personnel after installation and commissioning of the equipment for which schedule/number of days will be discussed and decided for day to day operation and trouble free working of the SEM. 21. Warranty: The quoted equipment should be offered with 3 years comprehensive warranty. AMC should be quoted for next 5 years
49	Ultra Microtome	Ultra-microtome for ultrathin sectioning for TEM • Cutting transmission with vibration decoupled gravity stroke • Cutting window setting 0.2 to 14mm • Specimen advance indicator 10 segments 20µm each • Illumination independently controllable • User friendly software update via USB • Built in Intensity control for Ioniser • Stereomicroscope (9.6x to 77x mag) with the M80 stereo microscope. • Integrated ergo wedge • Eucentric microscope movement with defined click positions for glass knife and diamond knife operations (+5° to -8°). Ergo-Wedge 5°-25° • Built in Anti vibration system • 4 x LED illuminations system for top light, spot light, back light and specimen trans Illumination • Fully motorized knife stage for N-S and E-W movement (25mm E-W, 10mm N-S), • Including N-S step movement (from 0.1 to 15µm steps) • 10.4” touch screen controlling the Ultramicrotome and the Cryo chamber • Display of Countdown, E-W measurement & knife usage monitoring • 5 Memories for speed AND feed settings • Cutting speed setting from 0.05 to 100mm/s • Section thickness setting 0 – 15000nm • Standard sectioning counter/feed totalizer AND countdown mode for exact trimming • E-W measurement for exact block face trimming

		• Auto trim function • Rocking mode trim function • User, sectioning, knife parameters and grid box parameters download via USB (logbook) ❖ Glass Knife maker for Ultra-microtome • 100% balanced break method • Breaks glass from 6.4 & 8mm • Variable scoring lengths • Accurate glass strip positioning • Drawer system offers convenient and safe knife removal • Auto reset of breaking and scoring mechanism • Push action score for even scoring • Adjustable scoring pressure • Breaking wheel with scale for defined and reproducible glass break Clamping lever with defined clamp position • Three years comprehensive warranty
50	Autoclave, Vertical	SPECIFICATIONS Capacity : 75 ltrs. , Stainless steel, Heater Power : 3.0Kw Working Chamber Size (Ø x D) : 400 x 600 mm, Carrier (Ø x D) : 1 of 350 x 550 mm Outer Dimension: 670 x 490 x 870+400 mm, Dressing Drum : Ø350×300(15×12")#S0082-25(2 reqd) ,Temperature Range : 122.0 °C ,Operating Pressure : 15/103.4. , Single lever lock for lid with single hand opening, Microprocessor Based Control & a high accuracy. Low water detection. Spring loaded safety valve for over pressure. Pressure interlock on door. Leak proof sealing, registered gasket design, Over pressure safety Low level water cut off Safe and sturdy chamber manufactured to ASME Standards in SS 304. Independent safety for over temperature\ Abrasion resistant and durable finish by heat curdy epoxy coating on steel exterior. Heater and pressure interlock safety. Dual scales of psi and KPA with temperature readout on pressure guage. Automatic purging and exhaust , Accurate temperature control with graphical programmable logic controller (P\LC) , Electrical on/off safety switch. Must be provided three years comprehensive warranty
51	Automatic droplet micro applicator	General specifications:- Maximum delivery capacity-350 microlitres, Overall height -13 cm, Overall width-23cm, Overall length-35cm, Micrometer unit less base plate 23x23x13 cm , Net weight-4.5kg, Gross weight -6.5kg., Including one packet of needles. Doses from 0.1µl to 1.0 µl in twenty steps. Mains or battery using a foot or ring finger switch. Non ferrous materials hard Anodised or Electroporated. Single selector lever, drop sizes from 0.1µl to 10µl in ten equal steps. Rewind positions, micrometer spindle in 50 seconds. The glass syringe Knurled screw. Mains power supply unit, 240Va.c. to 12 V d.c or 110 V a.c. 12 V d.c., 1 Buall glass micrometer syringe luer fitting, 1 hypodermic needle 3/10 mm x 25mm, 1 ring and finger switch. Must be provided three years comprehensive warranty
52	BOD Incubator	**Specifications:** *.Temperature Range: 5°C to 60°C,Temperature Accuracy: ± 0.5°C Uniformity: ±2°C.Capacity in litres: 280L,No.of Trays: 4 *No.of Doors: Single , Inner and Outer Stainless Steel 304, *Control System: Programmable Logic control with Safety controller, auto change over of Stand by systems with touch screen. Audio visual alarm . *Refrigeration System CFC free. Heating System. Motor and

		blower arrangement. Thick CFC free Glass wool insulation *Lighting, *Door: acrylic door ,Validation Port. Trays: Stainless steel perforated trays Other: Castor wheels, MCB, Adjustable Tray Height arrangements. Heavy duty latch with Lock and key Power: Works on 230V AC Single Phase 50Hz 1.Additional safety Thermostat to cut off the air heater. Voltage stabilizer Stabilizer with sufficient Kv. Must be provided three years comprehensive warranty
53	Laboratory Hot air oven	Capacity in litres: 325,No.of Trays: 4,No.of Doors: Single ,Inner Stainless steel 304, 0.8 mm & Inner SS 316 1.0 mm thick, Temperature Range: 5°C above ambient to 300°CTemperature Accuracy: 0.5°C,Programmable Logic control with Safety controller, auto change over of Stand by systems & other event managements with 4.3" color HMI with touch screen and Ethernet connectivity,Audio visual alarm , temperature Heating System: U Shaped S.S Nichrome wire air heaters,Air circulation.Temperature under loaded condition Insulation: 3" Thick CFC free Glass wool insulation Trays: Stainless steel perforated trays. Other: MCB, Adjustable Tray Height arrangements Power: Works on 230V AC Single Phase 50Hz,ET-999: Micro controller based Electronic Timer upto 999 Hours, Safety Feature: Additional safety Thermostat to cut off the air heater , Stabilizer: 2kv Must be provided three years comprehensive warranty
54	3L *In situ* Sterilizable Glass vessel Fermentor	Working capacity-3L,Flat Top-SS.316l, Borosilicate glass, Agitation, Mechanically coupled shaft, Silicon lip Seal, Rotating speed of 100 to 1000rpm, Six blade adjustable turbines, Pressure guage, Alkaliport inlet port, Inoculum /Antifoam inlet port, PRV, Airoutlet, Sampling port, Airinlet Ring sparger, Temperature probe port, pH probe port. Bottom ports with Heaters, Colling finger, Harvest port. Sensors with Temperature probe, pHprobe, DO probe and Air Rotameter. Fermenter a Borosilicate full glass vessel, steam jacketed vessel, mounted onto a circular ring made of stainless steel. The fermenter with flat top and bottom in-built catridge heaters for temperature control. Maximum operating temperature-125ºC. Vessel SS Top plate with flange nulled screws. Silocone moulded gasket. Agitation system with variable speed of 100 to 1000 rpm. Vessel with flat top and bottom with in built catridge heaters for temperature control. Top plate, with agitation system, Motor coupled to the shaft with a silicone lip seal. Impellers and Baffles, Stainless steel grade SS 316L, Electropolished , Agitator speed measurement and control, Temperature measurement and control, pH measurement and control, Aeration control, Absolute filters, Main power supply, Antifoam controller. Upgradation kit for PLC control with 4.3" touch screen HMI. Hot and cold water circulation. Chiller for 5 litre bath volume, Temp. control range +10ºC, to 60ºC, Temperature accuracy-0.5degree centigrade, Magnetic pump, D.O measurement and control. Must be provided three years comprehensive warranty
55	Potter spray tower	Frame with extruded Alluminium alloy section in self color finish and durable construction. Spray table with aluminium alloy spinning and well positioned. Nozzles in pairs for standard equipment for Intermediate and Final spraying. For accurate spray formation, with stainless steel jet and pick-up tube. Fully adjustable assembly for level and centralising over the spray tube.

		Adjustable spray table for positioning the specimen dish beneath the spray. Constant supply of 1.5 - 2 kg/cm^2 controlled by an on/off switch and exhaust valve. Fine adjustment, pressure gauge, or manometer. The air jack and nozzle head. Must be provided three years comprehensive warranty.
56	GIS Workstation	Intel Xeon E3-1225v5 3.3 GHz (up to 3.7 GHz) 8MB GT2 4C 80W TWR CPU • 8GB RAM 2133 MHz DDR4 • 2TB HDDs 7200 RPM • Internal DVD Writer • Integrated Gigabit Ethernet Controller • Graphics card (NVDIA Quadro K420) 2 GB dedicated RAM • Ports: 4 or more USB 2.0/3.0 USB keyboard and USB optical scroll mouse • 19" LED true colour monitor • O.S : MS Windows 10 Professional 64-bit To process the Satellite data, the workstation class machines are required with high system memory and graphics memory to support the image processing and GIS Software. Must be provided three years comprehensive warranty
57	Plotter, Scanner and Copier	**PRINT:** 25 sec/page on A1/D, 82 A1/D prints per hour Print resolution Up to 2400 x 1200 optimized dpi Technology: HP Thermal Inkjet Ink types Dye-based (C, M, Y); pigment-based (mK) Print heads: 1 (C, M, Y, mK) and accuracy: +/- 0.1% **Media** Handling Sheet feed, roll feed, automatic cutter. Size Rolls: Rolls: 279 to 914 mm (11 to 36 in) & Thickness Up to 0.3 mm **Memory**: 1 GB (virtual) **Connectivity** Interfaces: Gigabit Ethernet (1000Base-T), Wi-Fi, Hi-Speed USB 2.0 certified connection **SCANNING** Scan speed Color: up to 3.81 cm/sec (1.5 in/sec) Grayscale: up to 11.43 cm/sec (4.5 in/sec) Scan/copy resolution 600 dpi Maximum scan Size: 914mm x 2.77m (36x109in) Thickness: 0.8 mm (0.03 in) Comprehensive Warranty: 3 Years An input and output device is required to input the large format (A0 size) and also to take the final prints in large format. Hence the A0 size (36" width) Multifunction device which will be used for scanning, Printing and Copying the maps upto A0 Size.
58	GIS Software	31 users & Spatial extension 1 user, Geostatistical extension 1 user,3D Extension -1 user, Training 2 days each in 2 phases. Must be provided three years comprehensive warranty
59	GIS Software – ESRI Master Lab kit – 1 user	A multi user GIS Software is required for any Geo-informatics lab to analyze the Spatial data. Image Analysis software – Acdemic version ERDAS, ENVI/IDL, ISRO GIS(IGIS) ARC GIS with extensions – 2 no's Free soft ware's – QGIS, BEST/PolSAR can be supplied. Must be provided three years comprehensive warranty
60	Image processing software – 5 User	A multi user Image processing Software is required for any Geo-informatics lab to process the Satellite data like Cartosat, Resources at etc., acquired by Indian Remote sensing Satellites Must be provided three years comprehensive warranty

61	Handheld GPS	The handheld GPS receivers are required to know the position of the ground information collected during the field surveys. Must be provided three years comprehensive warranty
62	Local NAS	Capacity: LFF: 120 TB (single LFF array-head -using 12 x 10TB LFF SAS MDL drives) SFF: 76.8 TB (single SFF array-head - using 24 x 3.2TB SFF SSD drives) Cache: 6 GB per controller Total LUNs: 512 maximum LUN size: 140TB (128TiB) Host Interconnect: Controller should support connections with options of 16Gb, 8Gb FC and 10GbE, 1GbE (iSCSI per controller) and controller should support four 6Gb/12Gb SAS connections per controller using mini SAS HD cables Maximum Drivers: 96 LFF/199 SFF Maximum host should support: 64 in v2 UI Standard Soft ware: Snapshot, 64 (snaps) Optional Software: Remote Snap (linear storage only) Max Snapshot (512) Performance Tiering Usable capacity: 10 TB Must be provided three years comprehensive warranty
63	Air conditioners with timers	1.0 ton split AC, five star rating , Auto air swing with sleep mode, auto restart, front panel display, antirust outdoor casing with active carbon filter, rotary compressor, remote control, Outdoor unit mounting bracket, Outdoor noise level High 53 dB, indoor noise level - High 39 dB, multifold evaporation, copper condenser coil. Timer to operate between different units alternatively on shift basis for each unit 1.5 ton split AC, five star rating, two way auto air swing with 3 D air cooling, 24 h dual on and off real setting timer, sleep mode, auto restart, front panel digital display, copper condenser coil, rotary compressor, Outdoor noise level High 53 dB, indoor noise level - High 39 dB, multifold evaporation, Outdoor unit mounting bracket, speed setting operating mode. Timer to operate between different units alternatively on shift basis for each unit 2.0 ton split AC, five star rating, two way auto air swing, auto humid control, silent cooling, anti fungus filters, auto protection function, health air, compressor rotary, Outdoor unit mounting bracket, copper condenser coil. Timer to operate between different units alternatively on shift basis. Stabilizer along with exhaust air pipes is required separately for each item. Free installation with three year warranty for the product and five years for compressors
64	50 Kw Solar Panel	50 Kw solar PV system should consist of Solar PV modules consisting of required number of PV cells, Power conditioning unit or inverters with LCD display, mounting structures, cables and hardware, Junction box and distribution boxes as required, Earthing kit, Lightning arrestors, tool kit, PVC pipes and accessories. The specifications should include PV array capacity of 50Kw with crystalline silicon cell technology, modules of output 250WP or above, PCU efficiency>95%, Grid voltage of 415V, 3ph, PCU rating of 60 KWp, frequency of 50 Hertz, Power factor better than 0.9, Frequency variation limits +/-2%, DC offset

		current should be less than1% of the maximum current rating, With average 8-10 hrs. operation per day. The power conditioning unit (PCU) should contain a maximum power point tracker (MPPT), Grid side Converter Side Filter. The PCU must automatically synchronize with the grid and should shut down in case of faults and very low power generation, and wake-up automatically from shut down. The BOS items / components of the SPV power plants/ systems must conform to the latest edition of IEC/ Equivalent BIS Standards/ MNRE specifications. PV modules to be used in a highly corrosive atmosphere must qualify Salt Mist Corrosion Testing as per IEC / IS standards. Protections for over voltage, under voltage, over current and frequency errors required. In all faulty conditions the system should get isolated from grid and should start working when the grid is healthy • Phase sequence reversal should be automatically detected and system should continue to work. • When the grid fails, the system should stop operation and it get it isolated from the grid within a cycle before getting any damage to the system Subsidy for government organisations if any may be included. WARRANTY: PV modules used in solar power plant must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years. Must be provided three years comprehensive warranty
65	40 KVA, 3 Phase Diesel generator	The Air/Liquid cooled diesel generator set shall be three phase AC electricity at around 415 Volts and 50 Hz, would be used laboratories as per the system requirement. The engine should be of heavy duty, industrial type, rated for continuous operation, shall be able to handle unbalanced load for the commercial equipments such as air conditioners, deep freezers , weighing scale , lightings, ceiling fan and bore water pump(both three phase and single phase equipments). The engine should be built to IS 10000/ISO 4046/ISO 8528 -1/BS 5514/649 and rated for continuous running of 24 hours with an overload capacity of 10 % for a period not exceeding 1 hour in any 12 hours running. The alternator shall have 'H' class of insulation. It shall conform to IS 13364 (part II) 1992 or IS 4722 of 1992 above 20 KVA. The diesel generating set should be supplied with suitable control panel duly pre-wired for Genset 40 KVA capacity. DG set should carry a valid approval certificate issued as per CPCB norms complying with the provision of the Environment (Protection) second Amendment Rules 2002, vide notification no G. S. R. 371 (E), dated 17th May 2002& amended by G. S. R. 448 (E) dt.12/07/2004 Any other works including materials for supply, erection and commissioning of 40 KVA GEN SET will be borne by the

		supplier. Must be provided three years comprehensive warranty
66	Air Conditioners	1.0 ton split AC, five star rating , Auto air swing with sleep mode, auto restart, front panel display, antirust outdoor casing with active carbon filter, rotary compressor, remote control, Outdoor unit mounting bracket, Outdoor noise level High 53 dB, indoor noise level - High 39 dB, multifold evaporation, copper condenser coil. 1.5 ton split AC, five star rating, two way auto air swing with 3 D air cooling, 24 h dual on and off real setting timer, sleep mode, auto restart, front panel digital display, copper condenser coil, rotary compressor, Outdoor noise level High 53 dB, indoor noise level - High 39 dB, multifold evaporation, Outdoor unit mounting bracket, speed setting operating mode. 2.0 ton split AC, five star rating, two way auto air swing, auto humid control, silent cooling, anti fungus filters, auto protection function, health air, compressor rotary, Outdoor unit mounting bracket, copper condenser coil. Stabilizer along with exhaust air pipes is required separately for each item. Free installation with three year warranty for the product and five years for compressors

67	Water potential meter	• **Accuracy** • ±0.05 MPa from 0 to -5 MPa 1% from -5 to -300 MPa • **RANGE:**-0.1 to -300 MPa • **Measurement time** • In precise mode: • 10-15 minutes for most soil samples • 20 minutes for plant tissue samples • In fast mode: • <5 minutes (reduced accuracy) • **Sensor type** • Chilled-mirror dew point sensor/ Psychrometric Chamber 2) Infrared temperature sensor/Thermocouple • **Operating environment:** 5 to 40°C • **Data communications:** RS232A compatible,8-data bit ASCII code **Power:**110 V to 220 V AC 50/60Hz/ Battery Operated • **Display:**20 x 2 LCD/LED with backlighting • **Interface cable:** Standard RS232 serial cable • Optional :Provisions to connect multiple chamber in a single console devices • Optional: Sensors for measuring *in situ* water potential. • Three Year Comprehensive Warranty
68	Pyranometer	• Absolute Calibration: ± 3% typical, within ± 60° angle of incidence. o Sensitivity: Typically 75 µA/1mv per 1,000 W m^{-2} o Linearity: Maximum deviation of 1% up to 3,000 W m^{-2} o Response Time: Less than 1 µs /1 Sec

		• Cosine Correction : Cosine corrected up to 82^0 angle of incidence • Azimuth: < ± 1% error over 360° at a 45° elevation • Operating Temperature Range: −40 °C to 65 °C • Operating Relative Humidity Range: 0% to 95% RH, Non-Condensing • Detector: High stability silicon photovoltaic detector • Sensor Housing: Weatherproof anodized aluminium body with acrylic diffuser and stainless steel hardware; O-ring seal on the sensor base • Three Year Comprehensive Warranty
69	pH meter	Microprocessor based pH meter; Range: -2 to +14, Accuracy: 1% of range; Repeatability 0.05 % Temperature range -5 to 120 ^{O}C. Pre programmed buffer sets. Must be provided three years comprehensive warranty
70	E C Meter	Microprocessor based conductivity meter ; Range: 0-200mS, Accuracy: +_0.005;Repeatabilty 0.05 %.Resolution 0.05 % of range Temperature range 0 to 50 ^{O}C. Must be provided three years comprehensive warranty
71	Single Distillation Apparatus (Quartz), Horizontal Type	Distillation Unit- Single Stage Unit With Borosilicate Glass. Borosilicate Boiler Borosilicate Condenser Quartz Heater Distilled Water Output Capacity- 4 Ltrs / Hr. Type- Horizontal Type Electric Requirements - 230-250 V, Single Phase Power Supply, 3.5 Kw, Quartz Heater -5- Distillation Apparatus Power Supply With Automatic Cut Off And Buzzer Sound alert to Indicate Low Water Level Must be provided three years comprehensive warranty
72	Hot Plate-(Rectangular with cast iron top)	Specification of Laboratory Rectangular Heating Plate With Cast Iron Top: 1. Heating Plate Surface: The Cast iron plate machined to a smooth & leveled surface is fitted on a robust mild steel double body painted with an attractive stoving enamel . Top of rectangular cast iron plate has insulated beaded elements inside. 2. Heating Range: Up to 300 deg. C. continuous operation for long time. 3. Heating dimensions (approx) :18" x 24" with 3 kw rating 4. Accuracy in temperature: +/- 2 deg. C. or better 5.Uniformity:+/- 1 deg. C. or better 6. Controller: Provided with Thermostat (up to 300°C) or Energy Must be provided three years comprehensive warranty
73	Automatic weather station	Sensors for date, time, air temperature, relative humidity, rainfall, wind Speed, wind direction (all digital), solar radiation, soil temperature (0,5 and 20 cm depth),Soil moisture (20cm depth) 0-100%. Atmospheric pressure sensor (600 to 1100 h Pa with 0.1 h Pa resolution. Built in GPS, GSM modem, USB port to inter phase with computer for data transfer. 26 Ah MF battery. Interval for logging for 1 min to 24 hours and should be programmable for the use. 10 feet tripod stand, 30 watts solar panel, 8 channel data logger with 2 line LCD display and weather proof enclosure. For rainfall tipping bucket (switch closure type- 1 tip = 0.5 mm). 2 GB Micro-SD card for Data storage Must be provided three years comprehensive warranty and manufacturing defects should be provided.

74	Fume hood	Dimension: 1500 L x 750 W x 2400 H in mm Bed size:1350 x 600 in mm. Black granite top, Door, Powered by 1 HP 1380 RPM TEFC (Totally enclosed fan cooled) 3phase in build good make motor, Ducting, Baffle, Impeller, Baffled by 3 mm thick FRP sheet, Centrifugal blower, Casing, Coupling, Sash, Shutters, Suction expected 800-1000 cfm(cubic feet per minute). Includes lighting, electric arrangements, cable entering port ,Sink and Water tap. Must be provided three years comprehensive warranty
75	Island table	Per meter 20 gauge electro galvanized sheet with Epoxy polyester powder coating. It should consist alternative modular with Top drawer and Bottom cupboard. Bottom cupboard should have one no. Inner horizontal partition. All the drawers must have locking arrangements.2 No's of reagent Rack should be provided.4 No's of 15/5 amps 3pin socket cum Switch should be provided.1 No's of P.P/porcelain Sink (560x355) mm With 3 way water tap should be provided .IVORY/ BLUE colour. Must be provided three years comprehensive warranty
76	Wall table	Per meter 20 gauge electro galvanized sheet with Epoxy polyester powder coating. It should consist Alternative modular with Top drawer and Bottom cupboard. Bottom cupboard should have one no. Inner horizontal partition. All the drawers should have locking arrangements..4 No's of 15/5 amps 3pin socket cum Switch should be provided.**1 No's of P.P/porcelain Sink (560x355) mm With 3 way water tap should be provided** .IVORY/ BLUE colour. Must be provided three years comprehensive warranty
77	Corner box	1050LX1050WX900H mm 20 gauge electro galvanized sheet with Epoxy polyester powder coating .It must consist modular with Bottom cupboard. Bottom cupboard should have one no. Inner horizontal partition. (18mm $\pm$1mm) thick well-polished. Black granite should be provided. IVORY/ BLUE colour. Must be provided three years comprehensive warranty
78	Cushion top laboratory stools	Galvanized iron height adjustment stools with cushion top. Must be provided with three years comprehensive warranty.
79	Laminar air flow bench system (4x2x2 ft) Vertical	• Micro controller based • SS body • Quality tested approved HEPA filters of class 100 with an efficiency of 99.99%, Particle Retention: 0.3 Micron. • Cleaniliness: Class 100 • Hours meter for HEPA • UV light **Features** • SS bench top, acrylic shutter, germicidal lamp and fit with glass bead sterilizer of reputed make. • Three year comprehensive warranty
80	Laminar air flow bench system (2x2x2 ft) Horizontal	• Micro controller based • SS body • Quality tested approved HEPA filters of class 100 with an

		efficiency of 99.99%, Particle Retention: 0.3 Micron. • Cleaniliness: Class 100 • Hours meter for HEPA • UV light **Features** • SS bench top, acrylic shutter, germicidal lamp and fit with glass bead sterilizer of reputed make. Three year comprehensive warranty
81	Digital electronic balance - Internal	• Maximum Capacity 320 g • Readability 1 mg • Repeatability 0.1 mg • Linearity 0.2 mg • Three years comprehensive warranty
82	Digital Electronic Balance - Internal	• Maximum Capacity 220 g • Readability 0.1 mg • Repeatability 0.1 mg • Linearity 0.2 mg • Three years comprehensive warranty
83	Digital Electronic Balance - Internal	• Max. Capacity 220g. • Precision 1mg • Three years comprehensive warranty
84	Bioinformatics Work station	Xeon E5-2667 v3 3.2 2133 8C CPU processor or better • 32GB RAM 2133 MHz DDR4 populated with minimum 16GB DIMMs • Integrated SAS controller • Hardware RAID controller with RAID 0, 1, 5 and 10 • 2TB HDDs 7200 RPM • Internal DVD Writer • Dual Integrated Gigabit Ethernet Controller • Graphics card (NVDIA Quadro K4200) 4 GB dedicated RAM • Ports: 4 or more USB 2.0/3.0 ports (2 in front) , 2 X PS/2 • USB keyboard and USB optical scroll mouse • 24" IPS LED true color Full HD monitor with 1900 X 1200 resolution • Compatibility for both Windows and Linux operating systems • O.S : MS Windows 10 Professional 64-bit • With inbuilt software programmes related to bioinformatics for primer designing, sequence alignment, searchers, phylogenetic studies, QTL identification etc with academic versions • Laser Printer facility with both colour and black and white output with 150 Sheet Input Tray, Control Panel overlay, USB Cable Output bin support, Power cord, Documentations CDs, Support flyer, (20PPM, 1200 x 1200 dpi, 64 MB RAM, 1500 Pages starter catridge). • Must be provided three years comprehensive warranty
85	Digital Micropipette Kit	(1-1000 microlitres) 1.) 0.5 µl-10 µl 2.) 10-100 µl.,3)20-200 µl and 1000 µl – with stand,10 rack, 1x96 200 rack, 1x96 1000 rack, 1x96, Pipetting Guide, Autoclavable. Meet virtually any specification need. Must be provided three years comprehensive warranty
86	Magnetic stirrer with hot plate	Magnetic stirrer with hot plate:- Max.Rpm: 200-2200, Digital display :Yes, Load capacity: 2L, Heating temp. Range: Ambient to 350 deg.C. Must be provided three years comprehensive warranty
87	Leaf area meter	Touch screen based android tablet to cover tiny to large size leaves. Measurement for leaf. Area, leaf Length, Leaf width etc., leaf holder, Leather Case for Tablet.*App for Diseased area % measurement app for location stamping using inbuilt GPS. Measuring thickness- more than

		15mm Measuring width-more than 600mm. Measuring length- more than 100cm.Scanner-5M Pixel Camera.Resolution -0.0025 mm^2. Accuracy -1% for sample more than $10cm^2$. Interface USB2.0, Memory size more than 8000, Display-9.7" full screen 40 lines *Scanning speed morethan 200mm second,Battery 7.2 Volt rechargeable NiMH.,Battery capacity-15hours. Operating temperature-0-50^0 c. Must be provided three years comprehensive warranty
88	Rotary vacuum evaporator	Height adjustment-155mm with manual Lift. Vertical, Rotation speed RPM-20-300.One (single) piece vapour Tube. Combi-Clip(Clamp).Suitable for 50ml to 5000ml evaporation flask. Rotation speed setting; LED display. Rotation speed drive-Motor power-60w.Heating power-60w. Heating capacity-1300w.Total power-1360 W. Temperature range heating bath 20-210degree centigrade. Temperature accuracy bath-1 degree centigrade. Over protection bath; cut off at 5 degree centigrade over set temperature via separate Pt100.Bath temperature setting; Digital LED display. Heating bath temperature control; electronic/digtal display. Secondary over temperature cut off; 250 degree centigrade. Material heating bath; Ceramic coated. Volume heating bath (L) ; Dia 255mm.Sealing Ring; PTFE. PTFE Charging pipe connected with stop-cock. Power supply- 230v AC, 50Hz.Diaphragm vacuum pump, Model AD2C,Ultimate vacuum-9 mbar. Power input-180 watts, Max back pressure-1bar.Max pumping speed-2.0cubicmeters per hour, Inlet connection -10mm,Outlet connection-10mm,Noise level=-45 Dba, Supply voltage-230VAC, 50HZ.***With Recirculation chiller-*** Working temp range- -15 degree centigrade to plus 20 degree centigrade. Temperature stability- plus or minus 1 degree centigrade. Cooling capacity- 500w @ 0 degree centigrade. Pump pressure max- 18 L/min. Bath Volume – 4.5 L. External Body and bath- Stainless steel. Suitable for single rotary evaporator. Must be provided three years comprehensive warranty
89	Vernier calipers	Digital Vernier Caliper 8" (0.01mm)mm/inch . Must be provided three years comprehensive warranty
90	Water bath shaker	Capacity : 22L Internal Dimensions (WxDxH) in mm : 390 x 280 x 210 Flask holders : 6 nos. of 250 ml Shaking Speed: 30 to 175 osc. Double walled , insulated, full stainless steel construction, High Gabled SS ltd, Removable SS tray of modular design to accommodate flask holders of different capacities, Temp. safety cut-out with alarm. Control –Digital 0.1˚C resolution Control Accuracy-±0.2˚c to 37˚ C, RPM-digital, Temperature range –Ambient +5 to 80˚C , Shaking speed-30-175 RPM, Stroke length -25mm, Duty cycle-8 hours. **Optional accessories :** Flask holder for 100ml flask, Flask holder for 500 ml flask, Flask holder 1000ml flask, Flask holder 2000 ml flask**,** Tray universal. Must be provided three years comprehensive warranty
91	Emulsifier	Multi-mix unit high speed of 16,000 RPM. Motor and container, vertically adjustable Spindle permit toxic or infection materials. Solid State speed controller to adjust speed, Sufficient motor to provide to power. Complete with motor, speed controller with stainless steel cups Capacity (i)With 25ml, 50ml,100ml, or 5ml to 25ml (ii) 250 ml. Must be provided three years comprehensive warranty
92	Lyophilizer 2 Litres	2 litres Ice holding capacity.Cold trap temperature of -86ºC. Drying chamber with cylindrical made of thick guage 304 grade stainless steel. Four ports for drying with quick seal valves. Cold trap with made of thick guage 304 grade stainless steel. External Vacuum pump , Vacuum level

		0;.5 to 0.002 mbar. Microprocessor based controller with digital display, PT 100 sensor. Temp. resolution 1ºC, Refrigeration on/off, Vacuum on/off. Powder coated mild steel. CFC free cascade refrigeration system. Facility for water drain. With conical flasks, cork and glass adoptors. With sufficient power supply. Ampule accessosry. T-ampules. Different capacities of ampoules and Sealing torch. Must be provided three years comprehensive warranty
93	GIS SERVER	Tower Model • Intel® Xeon® E3-1220v3 (3.1GHz/4-core/8MB/69W) • 4 DiMMs Slots • 4 GB DDR3 RAM • 3 LFF(3.5inch) Non Hot Plug SATA • 2TB *2 Sata hard Disks • HPE Smart Array B120 i SATA RAID Controller • DVD RW • 1 x 350 Watts Non-Hot Plug • 2 -Port Ethernet Server Adapter (X2) • HPE iLO (Firmware: HPE iLO 4) • Microsoft Windows 07 professional OEM • 19" TFT • HP Keyboard &Mouse • Warranty 3 Years This Server with large(4TB) Hard disk Space is required to keep the satellite data, GIS files, which will occupy more space and to serve the Software Licenses for all the users. Must be provided three years comprehensive warranty
94	GIS Workstation	Xeon E5-2667 v3 3.2 2133 8C CPU processor or better • 32GB RAM 2133 MHz DDR4 populated with minimum 16GB DIMMs • Integrated SAS controller • Hardware RAID controller with RAID 0, 1, 5 and 10 • 2TB HDDs 7200 RPM • Internal DVD Writer • Dual Integrated Gigabit Ethernet Controller • Graphics card (NVDIA Quadro K4200) 4 GB dedicated RAM • Ports: 4 or more USB 2.0/3.0 ports (2 in front) , 2 X PS/2 • USB keyboard and USB optical scroll mouse • 24" IPS LED true color Full HD monitor with 1900 X 1200 resolution • Compatibility for both Windows and Linux operating systems • O.S : MS Windows 10 Professional 64-bit. Laser Printer facility with both colour and black and white output with 150 Sheet Input Tray, Control Panel overlay, USB Cable Output bin support, Power cord, Documentations CDs, Support flyer, (20PPM, 1200 x 1200 dpi, 64 MB RAM, 1500 Pages starter catridge). Must be provided three years comprehensive warranty
95	Tissue Culture Racks with Photoperiodic regulators	Racks of prime 316 grade steel material, vertical tubular frame, side tray support channels, heavy gauge tray support angles, tubular bottom frame, heavy duty solid mild steel wheels fitted with double bearings, rigid gear box with heavy duty gears, chains, bearing blocks, manual operated feather touch smooth. All spares should be plated, racks are coated with high quality pure polyester powder (coated) non corrosive, no peelings, high density reflexive paint, more light LUX, fine adjustable tube light fixtures, **variable size of length, height, mobile type.** **Input Voltage :** 200-240 V AC, 50 Hz **Lighting :** Glare free four fluorescent LED tubes in upper portion in worktable. **Lux meter** **UV Germicidal Light :** Are fitted inside the rack.

		Chocks : All fluorescent tubes chocks and ultra violet germicidal tube chocks to be fitted inside / outside of rack. **Timer :** Photoperiodic timers, 0-24 Hours Digital Timers to be provided of tissue culture rack for the duration of illumination. **Control Panels :** All control panels are fitted tops of tissue culture racks. On / Off switch of fluorescent tubes and UV tubes. All control panels are fitted separately in each rack with indicator light.
96	Laboratory Trolleys	Laboratory Trolley of stainless steel (304 grade steel). Three compartments, heavy gauge material, square tube legs, round push handles, on 100 mm diameter solid tiers, 300 kg, load bearing capacity, buffed to mat / mirror finish, all materials – welded with argon arc finish.
97	Tissue Culture Bottle Washing Machine	External body stainless steel body, internal frame mild steel, 0.05 hp motor. 960 rpm, three phase, ISO certified motor, heavy duty rotary, pulley driven , on and off switch, should wash both externally as well as internally two bottles with 15 seconds, wall /tube mounted machine
98	Refrigerator (Gross storage 305 to 330 l)	Double door, frost free, five star rating, CFC free, power saver compressor, capable of working 220 V Puff/Maxi 2/ Polyurethane insulation, Microblock, moisture retention technology, with accessories like adjustable shelves, temperature controller auto lamp on off feature should be supplied with all standard accessories as per manufacturer catalogue for the model supplied along with voltage stabilizer. Unit should comply with relevant IEC safety standards. Three year comprehensive warranty
99	Thermomixer	• Active counter cooling facility for greatly expanded application range • Improved mixing and incubating • Flexibility through a selection of nine different exchangeable Thermo blocks for - Micro test tubes 1.5 mL - Micro test tubes 2.0 mL - Thermo top should be there for control evaporation and improves temperature homogeneity in the reaction vessel. • Programmable : two different program sequences with mixing and rest phases • Device control and documentation according to GLP over RS 232 interface • Should be IVD /CE Certified • There should be option to exchange following blocks - MTPs in all well forms 96 well - 8 Falcon tubes 15 mL - 4 Falcon tubes 50 mL - 1.5 – 2 mL cryo tubes - 4 slides - Micro test tubes 0.5 mL - Tubes with 11-11.9 mm Three year comprehensive warranty
100	Minispin	• Rotor Capacity 12x1.5/2ml • Max Speed; 14,100g and 14,500 RPM • Timer ; 15s to 99 min • With Rotor for 2 ml and PCR strip rotor • Separate short spin key • Ventilation flow for protecting temperature sensitive samples • CE certified

		• Three year comprehensive warranty
101	Micro Pipette	• Spring Loaded Tip Cone for connecting tips very tightly • Adjustment opening for adjusting pipettes to a specific liquid and volume. • Control Button with very low operating force, Color indication for pipette volume. • Tip ejector with very low operating force, positioned for perfect ergonomics. • Volume Display: 4 Digits with magnifier.. • Very easy removable lower part for cleaning pipette • Fully Autoclavable • No discoloration upon UV irradiation • Volume range 0.1 – 2.5 µl, 2-20µl, 20-200µl, 100-1000µl • 3 Years Comprehensive Warranty
102	Multi channel pipette	• Spring Loaded Tip Cone for connecting tips very tightly • 8 channel • Adjustment opening for adjusting pipettes to a specific liquid and volume. • Control Button with very low operating force, Color indication for pipette volume. • Tip ejector with very low operating force, positioned for perfect ergonomics. • Volume Display: 4 Digits with magnifier. • Very easy removable lower part for cleaning pipette • Fully Autoclavable • No discoloration upon UV irradiation • Volume range 0.5-10, 20-200 micro lits • 3 Years comprehensive warranty
103	Pipetteman 10 ml	• Intuitive and convenient speed adjustment must be done with the tips of fingers • LED indicator for balance of battery life • Lithium polymer rechargeable battery • Smooth and gradual setting of pump speed • Autoclavable pipette adapter for sterile applications • Quick release of aspirating cone for easy exchange of membrane filters • 3 Years comprehensive warranty
104	Cryocans	• Capacity 30 L, 15 L, 10 L • Static holding time of 170 to 175 days with canisters and SS funnel for decanting. • Three year comprehensive warranty
105	Digital Multi Chamber Water Bath	• Capacity: 10-15 litres each of 3 baths as one unit • Temperature range : ambient +5 to 100^{o}C • Controller: digital Fuzzy controller • Digital display of time and temp. separately for each chamber • External with powder coated SS and internal with SS (#304) with SS lid • Auto power resume , storage functions, Locking mode, alarm functions • Timers should be delay and continuous function type • Three year comprehensive warranty

106	Ice Flaking Machine	• Ice flake production: 70 -90 Kgs / 24 hrs. • Compact, bench top model • Three year comprehensive warranty
107	Top Loading Balance	• Max. Capacity 1.5 / 3 KG • Readability : 1g • Three year comprehensive warranty
108	Gel Rocker	• Microcontroller Based Laboratory Rocker • Motor: Brusheless D.C. Motor • Drive: Variable Drive • Speed Accuracy : $\pm$ 1 rpm • LCR-330 • Display :LCD • Timer Minutes: 1-1199 • Tilt angle : 9^{o}C • Speed RPM: 10-70 • Three year comprehensive warranty
109	Hot Air Oven	• Forced air circulation, Double walled outer and inner SS and lagged with Glass wool insulation, Bottom heaters covered by perforated sheet. • Temperature range: 5^{0} C above ambient to 250^{0} C. Accuracy: +/- 1.0^{0}C, • Volume: 325 lts. • No. of perforated shelves: 3 • Temperature control: PID • Digital display : Red LED • Voltage: 220V. • Three year comprehensive warranty
110	Magnetic Stirrer	• Number of hot plates separately on single unit: three • Digital display of time, temperature and rpm for each hot plate separately. • Hot plate size: 140x140mm • Plate should be made up of ceramic coated aluminium and body powder coated SS • Stirring capacity: max. 15 lit/ plate • Speed range: 80-1500 rpm • Speed control resolution: 5rpm • Max. Temp. Range: 100^{o}C • Auto power resume and storage functions of time, temp. and rpm • Three year comprehensive warranty
111	Microwave oven	• Capacity :28 L • Triple Distribution System • Trio: Triple Heating System • Ceramic Enamel Cavity • Crusty Plate & Multi Spit. • Three year comprehensive warranty
112	Automatic autoclave	• Autoclave fully automatic - Top Loading • Capacity: 50-55 L • Pressure: 30 psi • Fully automatic with LCD controller cum time automatic exhaust • S.S double walled construction. • Three year comprehensive warranty

113	Hybridization oven	• Rotisserie capacity 10 medium bottles, drip tray included • Digital Control , Display LED • Speed - 5 to 15 rpm • Shaking motion - UP/DOWN • TEMP RANGE (METRIC) : $+35^0$C TO $+85^0$C $\pm$ 0.25^0 C with in bottle • Voltage 220V • Quote price of heat resistant O ring cap small and medium bottle under optionals • Three year comprehensive warranty
114	Sonicator	• Ultrasonic processor (probe type) • Net power output: 130Watt, Frequency: 20 kHz • Standard probe: • Material: Titanium alloy solid probe. • Tip diameter 6mm. • Processing capabilities : 10ml to 50 ml • Minimum volume probe : 0.25 to 10 ml • Programmable for speed, power and time • Microprocessor control • Quote probes of various capacities • Three year comprehensive warranty
115	UV Torch	• Hand held UV Lamp / UV Torch for running gel observation • UV Source: 2 x 4 watts UV tube • Wavelength : 360nm • Three years comprehensive warranty
116	Homogenizer	• Stator and rotor type • Minimum volume tip for grinding: 0.1 to 5ml • Motor capacity - 200 to 300 watts • Number of interchangeable grinding tips: 3 to 4 • Plate stand • Max .Speed : 30,000 rpm • Three year comprehensive warranty
117	DNA Cross Linker (UV Cross Linker)	• Wave length of 254 nm • 5 UV tubes of 8 watts • Exposure time settings facility • Microprocessor control and Programmable • Three year comprehensive warranty
118	Western Blot (Semi Dry Blotter)	• Maximum gel size (W x L): 24 x 16 cm • Buffer volume: 200 ml • Gel capacity: • 4 Mini- pre-cast or hand cast gels, • 3Midi gels, 3 maxi gel sandwiches • Three year comprehensive warranty
119	Vortex shaker	• Vortex Mixer with general purpose cup attachment. • Three year comprehensive warranty
120	Refrigerated Water Bath	• Water bath with 30 litres capacity • Ambient temperature: 0^oC to 80^oC • Digital display for temperature and time • Programmable microprocessor control with stainless steel lid • Three year comprehensive warranty
121	Water bath	• 20 litres capacity

		• Ambient temperature + 5°C / 100°C • Stainless steel lid for above Water bath • Three years comprehensive warranty
122	Air curtains- (4 to 6 feet sizes)	4 feet to 6 feet size air curtains Motor capacity : 0.33 HP, 1440 RPM, Single phase with one motor and 2 aluminium blowers Velocity : 18-27m/sec Body type : 18-22 gauge of MS powder coated body Must be provided three years comprehensive warranty
123	Lab Fire Extinguisher	6 kg capacity, dry powder fire extinguisher, Stored pressure multi Purpose (Lab Fire Extinguisher) with Installation. Suitable for classes of fire: Wood, paper, fabric, oil, kerosene, petrol, LPG gases, electrically started fires. Must be provided three years comprehensive warranty
124	Cushion top laboratory revolving chairs	304 grade stainless steel, cushion top hydraulic height adjustment system, with medium back rest with supporting foot ring, mounted on heavy duty plastic base of five castors
125	Stainless steel ladder	16 gauge steel construction five steps, non skid plast feet, capacity 150 kg, with rectractable casters, foldable ladder

*** Important Note**: *The Instrument supplier must be either the original manufacturer or their authorized distributor/dealer and an authorization letter to that effect must be enclosed along with the quotation in case of latter.*

Annexure A
(Annexure to Tender Form)
Specification of the material to be supplied

1) Item of specification	:	
2) Approximate quantity required	:	
3) **Rate**	:	
4) Place of delivery/ installation	:	Central Instrumentation Cell Agricultural College, BAPATLA, 522 101, Guntur District, Andhra Pradesh
5) Period of delivery	:	

Annexure B
(Annexure to Tender Form)

Submission of Tender and Deposit of earnest money

1. Tenderers must fill in their rates in the tender form and return it duly signed in token of their acceptance of the conditions laid down herein.
2. Tenders should be written legibly in ink or type written. No alterations should be made to any of the terms and conditions of the tenders by scoring out, altering or overwriting. The tenders not complying with these conditions will be rejected summarily.
3. Tenderers are required to deposit **EMD 2%** of the estimated value of each item as specified from 1 to 66 of the tender notice separately as earnest money with the University in the form a crossed Demand Draft drawn in favour of **the Comptroller, Administrative Office, Acharya N G Ranga Agricultural University, Lam, Guntur, Pin 522 034, Andhra Pradesh**
   a. All the offers for the specified items 1 to 66 without earnest money will be rejected.
   b. Request for adjustment of pending bills/deposits, if any, towards earnest money/ security deposit will not be entertained.
4. Separate quotation/ tender for each individual instrument/equipment should be submitted.

Note: Cheques, Government security (stock certificates, bearer bonds, promissory notes, cash certificates etc.,) will not be accepted.

Validity of rates and other conditions

1. Warranty period for the goods shall be given as per the specification provided in the tender form, from the date of installation. In the event of any correction of defects or replacement of defective material during the warranty period is to be ensured. The warranty for the corrected/ replaced material shall be extended to a further period of 12 months over and above the stipulated period of warranty prescribed in the respective technical specifications of the item, if any.
2. Bids shall remain valid for a period of 90 days or more from the date of opening of the bid prescribed. In exceptional circumstances, the purchaser may solicit the bidders's consent for an extension of the period of validity. The request and response shall be made in writing/cable/telex/fax/e-mail.

3. The validity of the tender will extend for a period of twelve months from the date of placing the initial order and it shall be open to the ANGRAU to place the orders with the suppliers on the same rates, terms and conditions for any additional quantities likely to be recurred during that period
4. **The bidders shall seal the original and another photocopy of the technical bid in separate inner envelops duly marked as "Original" and "Photocopy" and place both the envelopes in an outer envelope (A4 size).**
5. The inner and outer envelopes shall bear the following address:

The Associate Dean,
Agricultural College,
BAPATLA, Pin 522 101
Guntur District,
Andhra Pradesh, INDIA

6. It should also bear the reference of the invitation for bids mentioned in the advertisement, and a statement on envelop "**TENDER FORM – DO NOT OPEN"**
7. **The inner envelopes should also contain the name and address of the bidder.**
8. Telex, cable, e- mail or facsimile bids will be rejected.
9. Bidding documents must be received by the purchaser at the address specified **not later than the time and date specified being declared as a holiday for the University**, the bids will be received up to the appointed time on the next working day.
10. The Bidder's representatives must bring ID card and company authorization letter bearing authorized seal who shall be present on the date of opening of technical bids and also should sign in the register evidencing their attendance. In the event of the specified date of bid opening being declared a holiday for the University, the bids shall be opened at the appointed time and date and location on the next working day.
11. The opening of technical bid may continue for two or three days depending on the number of bids received per item.
12. During evaluation of bids subsequent to opening, the University may at its discretion, ask the bidder for clarification of its bid. The request for clarification and the response shall be in writing and no change in prices or substance of the bid shall be sought, offered or permitted
13. The purchaser's evaluation of the bid will take into account, in addition to the bid price (Ex- factory, ex-ware house /off – the – shelf price of goods offered in components and raw material incorporated in the goods, excise duty on the finished goods, if payable, and price of incidental services like cost of inland transportation, ex- factor, from the port- of entry, insurance and other costs within India incidental to the delivery of goods to their final destination. Delivery schedule offered in the bid, deviation in payment schedule from that offered and availability in India, of spare parts and after-sale services for the equipment offered in the bid shall also be taken into account.
14. The estimated time of arrival of the goods at the project site should be calculated for each bid after allowing for reasonable transportation time.
15. Locally manufactured goods will be purchased according to regular procedure of the University by opening LC, if needed. The payment will be made on successful installation of the equipment and upon submission of the documents pertaining to the goods, including four copies of the invoice, insurance certificates, manufacturer's / supplier warranty certificates, detailed operation and maintenance manuals.

Acceptance of tenders

1. Tenders will be opened on specified date in the presence of such tenderers as may be present. A decision with regard to acceptance of tender, will be taken as soon as possible.
2. The successful tenderer(s) will be intimated by letter(s) or other means of communication and the tenderer(s) so informed shall be bound from the time of tender(s) will be forwarded to successful tenderer(s) in due course but it will serve merely as a confirmation of the initial information and shall not effect the time from which the offer is / are bound by the contract(s).
3. The University is not bound to accept the lowest quotations/tenders. Any or all the quotations/tenders may be rejected without assigning any reasons. It reserves the right of acceptance in whole or part of the offer made. The officer should justify with reasons the superiority of the article than the articles of the lowest tender. He should furnish reasons on the comparative statement of the tenders. The officer will be personally held responsible for the deviations. The decision of the ANGRAU in the matter shall be final and binding on the tenderers.
4. The University may decide to split the order between two or more firms in a manner convenient to it.
5. Successful tenderer shall execute an agreement in accordance with these terms and conditions.

Security deposits:

1. The successful tenderer(s) shall, within 7 days after the University's written notice of acceptance of the tender has been posted to him or them, shall deposit with the Agricultural University 2% of the value of the goods required or authority (University) may fix the amount according to the value of the tender as a security for the fulfillment of the contract. The earnest money deposit/security deposit shall carry no interest. The security deposit to be deposited will be in additional to the earnest money deposit.
2. The University reserves the right to forfeit and confiscate earnest money deposit, should the successful tenderer fail to pay the security deposit which is required under the terms and conditions of this tender.

Other contractual obligations

1. The contract shall not be capable of being varied except by written consent by both the purchaser and the supplier and the Agricultural University shall not in the absence of the specific written acceptance be bound by any provisions of the supplier's quotations/tenders, offers etc., which purport to impose conditions, at variance with this contract.
2. The supplier shall not sublet or delegate this contract or part thereof without the written consent of the ANGR Agricultural University. Such consent shall not, however, be withheld unreasonable, but the Tenderers any, without the consent of the Agricultural University, purchase material which he/ they does not normally manufacture.
3. The supplier shall keep confidential all matters concerning this contract and comply with all reasonably security requirements. All drawing, blocks, specifications, manuscripts, samples etc., supplied by the Agricultural University and all copies thereof shall be returned to the University when their use is terminated. In no event, the

supplier shall permit publicity concerning this contract without the prior consent of the Agricultural University.

4. No undertaking or commitment given by or made by any officer of the University verbally or in writing does not have any validity unless it is signed by the authority competent who concluded and agreement earlier.

Inspection and Packing

1. At all reasonable time during production and prior to dispatch of material, the supplier(s), shall afford and secure for the representation of Agricultural University every reasonable access and facility at his plant or premises for its inspection and making of usual tests on behalf of the Agricultural University, if so desired.
2. a) The supplier shall supply to the Agricultural University, on request, a report from time to time as to the progress of supplies. Any delay or anticipated delay will be reported at once together with the full reasons therefore.
   b) The responsibility of procurement of transport facilities and dispatch of the stocks in good condition and as per specification and in time / door delivery lies with the supplier and they must keep up the delivery schedule at any rate.

   c) The insurance should be done at the cost of supplier as the rate quoted is all inclusive for door delivery at the Central Instrumentation Cell, Agricultural College, BAPATLA, Pin 522 101,Guntur District, Andhra Pradesh, INDIA

3. Should the progress in supplies be delayed due to any cause beyond the reasonable control of The supplier and whether such delay or impediment occurs before or after the time for Dispatch, Reasonable extension of time might be granted by agreement between the parties.
4. The supplier shall insert in each case 3 copies of packing list, fully item wise to show case number, contents and full description of the contents. The concerned in-charge of the CIC, Agricultural College, BAPATLA at the receiving point will retain one copy with him/her and return the other two copies, duly signed to the supplier who will append one copy of this packing list with invoices when sent to the concerned for payment.

Supplies as per specifications

1. All supplies shall be to the description and to the specifications laid down and in strict accordance with the approved samples. Deviations, if any should be clearly brought out failing which it will be normally construed that the materials offered are not to our requirements. Any special features may also be clearly brought out.
2. The decision of the University, however, shall be final as to the quality of supplies received and binding up to the supplier. In case, the supplier(s) supplies any article other than what is ordered, such article supplied, not being approved, shall be liable to be rejected.
3. If the University requires any changes in specification, the supplier shall use his best endeavor to comply with University's wishes subject to fair fixation of prices and delivery schedule where appropriate.
4. If at any time during the term of this contract, the plans of the University change for any reason, the University shall have the right to terminate or alter this contract by sending fifteen days notice to the supplier(s) by registered letter. In respect of such of

the material, which is complete and ready for dispatch, within thirty (30) days of such notice, the University agrees to accept delivery thereof at the contract price and terms.

Consequence of non-supply and damages

1. All risks of loss, damage of depreciation to goods shall be upon the supplier until the material is delivered at the address specified and in accordance with the provisions of the contract. Till the material is received at the respective destination indicated by the University, the property continues to be at the risk of the supplier(s). the mere fact the material is delivered to transporter is no defence to the supplier and the supplier will be squarely held responsible for any delayed receipt of the material by the University or for loss or damage of any kind to the material in transit.
2. Assuming that the supplier fails to deliver any or all the material covered by the contract, the Agricultural University reserves the right in addition to other legal remedies, to cancel the contract or any portion thereof and holds the supplier liable for all damages sustained by the University by virtue of the supplier failing to perform the contract and consequent cancellation of the contract.
3. In the event of the supplier failing to complete the supply in time or according to the approved specifications, the University reserves the right to make such arrangements as it may think fit for the completion of supplies on account of and not at the sole risk of the supplier.
4. In case the goods are not supplied according to specifications and it is decided to retain the inferior goods at the discretion of the University, the supplier will be entitled to receive the payment only at the rate fixed by the University after taking into consideration the unsatisfactory quality of the material supplied and not at the rates mentioned in the order.
5. The time allowed for delivery of goods shall be deemed to be the essence of contract. In case the goods are not delivered within the stipulated period, the University reserves the right to recover the liquidated damages @ a sum equal to 2% of the contract price of the undelivered material per week subject to the maximum of 5% of the value of undelivered material. The University also reserves the right to cancel the purchase order in case supplies are delayed beyond the scheduled date of delivery and to make such arrangements as it may think fit for the completion of supplies on account and at the risk of the supplier(s). The additional expenses thus incurred together with the consequential losses and also the liquidated damages shall be recovered from the supplier out of his/their security deposit/ earnest money deposit and any other amount due to him/them. The balance still, if any, payable by the supplier shall be paid by him/them. The balance still, if any, payable by the supplier shall be paid by him/them within 7 days of notice by the Acharya N.G Ranga Agricultural University. All invoices shall be prepared in four copies and shall be signed by the supplier or his/their authorized agent. Every invoice shall bear a certificate to the effect that “the delivery and confirm in every way to the contract specifications and is packed in accordance with contract requirements and further that the invoice is correct in every respect and no other invoice has been rendered previously in respect of the articles charged in the particular invoice.” The invoices in triplicate shall be sent with L.R/R.R. by registered post Ack. Due direct to the University if it is from outstations and they shall be made within 15 days against submission of the complete documents such as bills, packing, invoices, challans, respect of goods in good conditions and satisfactory performance at

the destinations indicated by the University for supplies made as per accepted sample and specified quality. The payment of the bills shall be made by The ***Comptroller, Acharya N G Ranga Agricultural University, Lam, Guntur*** duly deducting the statutory deductions, if any.

FORFEITURE / REFUND OF THE EARNERST MONEY DEPOSIT / SECURITY DEPOSIT

1. In case the selected Tenderer(s) does not supply the stores at the quoted rates within the period of contract and commits any breach of any one or more of these terms and conditions, the Earnest Money Deposit and Security Deposit money deposited by the Tenderer(s) will be forfeited.
2. Earnest money of the unsuccessful Tenderer(s) shall be refunded within one month from the date of decision regarding the tenders. No interest is payable by University on such deposits.
3. Earnest Money and Security money deposited by successful Tenderer(s) shall be retained by the Agricultural University till three months after the expiry of the contract period. i.e., 12 months from the date of acceptance of the tender or the date on which the supply which may arise in consequence of repeat orders placed during the 12 months for which the rates quoted are to remain valid.
4. On due performance and satisfactory completion of the order in all respects during the contract period, the Earnest Money Deposit and the Security Deposit will be refunded to the Contractor(s) without interest within a period of 3 months with effect from the date of receipt of a request to this effect from the supplier(s).

SETTLEMENT OF DISPUTES

1. Any difference of dispute arising out of or in connection with this tender or acceptance thereof the contract that may be entered in consequence thereof, shall be decided by arbitration. Central Instrumentation Cell, Agricultural College, BAPATLA, ANGRAU, Acharya N G Ranga Agricultural University, Lam, Guntur or his nominee shall be the sole arbitrator and the arbitrator's decision shall be final and binding on the parties. The Tenderer(s) will have no objection to such appointment on any ground whatsoever including that such nominee, in his official capacity dealt with this matter at any stage.
2. The parties hereby agree that in the event of any dispute no cause of action shall arise in their favour to approach any court of law unless they have resorted to and exhausted the remedy or arbitration as envisaged above.
3. The parties also do hereby agree that the contract envisaged by these terms and conditions shall be deemed to have been entered into at Guntur and the courts at Guntur alone will have jurisdiction to try and legal proceedings which may arise out of this contract. Neither party shall file any proceedings in any proceedings in any other court.