



भा. कृ. अ. प. -राष्ट्रीय अजैविक स्ट्रेस प्रबंधन संस्थान

मालेगांव, बारामती-413115, पुणे, महाराष्ट्र, भारत

ICAR - National Institute of Abiotic Stress Management

Malegaon, Baramati- 413115, Pune, Maharashtra, India



F.No:4-6/2016/P/T-1

Date: 14/01/2016

TENDER NOTICE

1. The Director, ICAR - National Institute of Abiotic Stress Management, Baramati on behalf of the Secretary, Indian Council of Agricultural Research, Krishi Bhawan, New Delhi invites sealed tenders in the prescribed tender form **(Two Bid System)** for **“Supply, Installation, Demonstration and Commissioning of Laboratory Equipment and Diesel Engine set”** from the reputed manufacturers and suppliers. The details are as furnished below:

Sr. No.	Name of the Equipment	Qty.	EMD
1	Chemical Fume Hood	3	Rs. 39,000.00
2	Homogenizer	1	Rs. 9,000.00
3	Deep Freezer -20° C	1	Rs. 8,000.00
4	Centrifuge	1	Rs.10,000.00
5	pH Meter	1	Rs.4,000.00
5.1	pH Meter	1	Rs. 4,000.00
6	Real Time PCR	1	Rs.40,000.00
7	Gel Electrophoresis Unit (Vertical)	1	Rs.4,000.00
8	Gel Electrophoresis Unit (Horizontal)	1	Rs.12,000.00
9	Plant Growth Chamber	1	Rs. 85,000.00
10	Biosafety Cabinet	1	Rs. 6,000.00
11	Multiparameter portable water quality kit	1	Rs. 4,000.00
12	Analytical Balance	1	Rs. 4,000.00
12.1	Analytical Balance	1	Rs. 10,000.00
13	Microscope (Light)	1	Rs. 10,000.00
14	Viscosity meter	1	Rs. 9,000.00
15	Ultra-Sonicator	1	Rs. 9,000.00
16	Hot Air Oven	1	Rs. 3,000.00
16.1	Hot Air Oven	1	Rs. 20,000.00
17	Vacuum Pump	1	Rs. 2,500.00
18	Microscope Fluorescent	1	Rs. 5,000.00
19	Magnetic Stirrer with Hot Plate	1	Rs. 4,000.00
20	Magnetic stirrer with Temperature Control	1	Rs. 10,000.00
21	Top Pan Balance	1	Rs. 20,000.00
22	Automatic blood Analyzer	1	Rs. 9,000.00
23	Microtome	1	Rs. 5,000.00

24	BOD Incubator	1	Rs. 10,000.00
25	SPAD Meter	1	Rs. 3,500.00
26	Sonicator	1	Rs. 12,000.00
27	Reciprocating Shaker	1	Rs. 18,000.00
28	UV-Visible Spectrophotometer	1	Rs. 7,000.00
29	Comet Software with Dongle	1	Rs. 44,000.00
30	Real Time PCR	1	Rs. 8,000.00
31	DSLR Camera	1	Rs. 4,000.00
32	Micropipette Set	2	Rs. 10,000.00
33	Liquid nitrogen storage vessels	8	Rs. 6,000.00
34	Vortex	1	Rs. 3,000.00
35	Water Quality Monitoring System	1	Rs. 6,000.00
36	Digital cone penetrometer	1	Rs. 12,000.00
37	Advance Microwave Digestion System	1	Rs. 30,000.00
38	Glass Door Refrigerating Cabinet	1	Rs. 10,000.00
39	Laminar Air Flow	1	Rs. 9,000.00
40	Soil Thermometer	50	Rs. 5,000.00
41	Rotary Evaporator	1	Rs. 10,000.00
42	Magnetic Stirrer	1	Rs. 4,000.00
43	Diesel Engine with Generator set (250 KVA)	1	Rs. 58,000.00

2. The prescribed tender forms and other details can be had from this Institute on payment of **Rs.1000/-non-refundable** by cash or through a crossed demand draft drawn in favour of "ICAR UNIT NIASM, BARAMATI" on any working day from **14.01.2016** between **10:30 hrs to 16:30 hrs**. For full details please log on to <http://www.niam.res.in>. Tender form downloaded will also be accepted provided the tenderer has enclosed the cost of the tender document of **Rs. 1000/-** by means of DD.
3. The last date for the sale of tender form is **03.02.2016** up to **12.00 noon**
4. The last date of receipt of complete sealed tenders is **03.02.2016** up to **01.00 PM**
5. The process of opening of the technical bid will be on **03.02.2016** at **2.30 PM**

-Sd-
ADMINISTRATIVE OFFICER
NIASM, BARAMATI

TENDER DOCUMENT No.4-6/2016/P/T-1

**ICAR - National Institute of Abiotic Stress Management
Malegaon, Baramati - 413115, Pune, MS**

**INVITATION OF TENDER FOR “SUPPLY, INSTALLATION, DEMONSTRATION AND
COMMISSIONING OF LABORATORY EQUIPMENT & DIESEL ENGINE SET”**

COST OF THE TENDER DOCUMENT IS RS. 1000/- & E.M.D FOR EACH ITEM AS SPECIFIED
AGAINST EACH ITEMS

SALE OF TENDER DOCUMENT FROM **14.01.2016** FROM 10.30 HRS TO 16.30 HRS ON ALL
WORKING DAYS AT THIS INSTITUTE

LAST DATE OF SALE OF TENDER FORM: **03.02.2016** UP TO 12.00 Noon

LAST DATE AND TIME FOR ACCEPTANCE OF SEALED TENDER DOCUMENT IS ON
03.02.2016 UP TO 01.00 PM

DATE OF OPENING OF TECHNICAL BID FOR WILL BE ON **03.02.2016** AT 2.30 PM ONWARDS
PLACE OF OPENING BIDS IS AT THE CONFERENCE TABLE OF NIASM, MALAGEON,
BARAMATI-413115

ADDRESS FOR COMMUNICATION
THE DIRECTOR

ICAR - NATIONAL INSTITUTE OF ABIOTIC STRESS MANAGEMENT
MALEGAON (KH.)

TAL.- BARAMATI, PUNE- 413115, M.S

**Signature of the Bidder
(with firm seal)**

TENDER DOCUMENT No.4-6/2016/P/T-1

**ICAR - National Institute of Abiotic Stress Management
Malegaon, Baramati - 413115, Pune, MS**

**INVITATION OF TENDER FOR "SUPPLY, INSTALLATION, DEMONSTRATION AND
COMMISSIONING OF LABORATORY EQUIPMENT & DIESEL ENGINE SET"**

DD NO.

DATE

BANK

AMOUNT

NOTE: The envelope containing the tender as well as all subsequent communications should be addressed/delivered to: **DIRECTOR, ICAR - NIASM, MALEGAON KH., BARAMATI-413115, PUNE, M.S.**

All the communications must be addressed to the above officer by designation but not by name

To

Dear Sirs

On behalf of the Director, ICAR - NIASM, Baramati I invite you to submit your sealed tender for **“SUPPLY, INSTALLATION, DEMONSTRATION AND COMMISSIONING OF LABORATORY EQUIPMENT & DIESEL ENGINE SET”**. The terms and conditions of the tender are enclosed in the Annexure I. You may please submit our bid to this office in the prescribed bid form Annexure-II along with all the relevant photo copies of the documents referred in the Annexure-I and EMD amount as specified in the tender notice. The EMD may be paid by means of DD drawn in favour of **ICAR UNIT NIASM, BARAMATI**.

The complete set of the tender form including annexure in original may please be submitted to office after signing on all pages by the tenderer.

Yours faithfully,

-sd-

Administrative Officer

**Signature of the Bidder
(with firm seal)**

Tender Document No.4-6/2016/P/T-1
ICAR - National Institute of Abiotic Stress Management
Malegaon, Baramati – 413115, Pune, MS

Terms & Conditions:

1. Tender document

1.1 The non-transferable tender document, in English, may be obtained from the **AO, ICAR - National Institute of Abiotic Stress Management, Malegaon, Baramati** on any working day from the day of tender advertisement.

2. Tenders/Quotations

2.1 Must be sent/submitted in the Office of the **Director, ICAR - National Institute of Abiotic Stress Management, Malegaon, Baramati by 03.02.2016 till 01.00 PM.**

2.2 Tenders/Quotations must be written in English. All accompanying technical literature, and correspondence in connection with or arising from a bid shall be in English.

2.3 The price of the item may be quoted in either Indian rupees (FOR NIASM) or foreign currency. If Price is quoted in foreign currency then it will be converted to INR for comparison purpose as per the rate on the day of comparison.

2.4 The tender forms alongwith the specifications/details can be obtained at the cost of **Rs.1000/-** for each item in cash **upto 03.02.2016 at 12:00 PM.** (Except those who are National small Industries Corporation (proof should be enclosed). The tender form can also be downloaded from our website **www.niam.res.in** and submitted alongwith the Earnest Money by due-date. Where tender-form is downloaded from website, a demand draft of **Rs 1000/- in favor of ICAR Unit NIASM payable at Baramati** may be enclosed separately as the cost of tender-form.

2.5 Tenders/Quotations must be addressed to:- **The Director, ICAR-National Institute of Abiotic Stress Management, Malegaon, Baramati -413115**

3. Late Tenders

3.1 Any tender/Quotations received by the Purchaser after the deadline for submission of tender/Quotations will be rejected and returned unopened to the Tenderer.

4. Earnest Money

4.1 Bidders have to furnish Bid Security/Earnest Money worth as mentioned in tender notice in favour of **ICAR-Unit-NIASM payable at Baramati** along with the bid(s) from a

Nationalized Bank. The Earnest Money is required to protect the Purchaser against the risk of Tenderer's conduct, which would warrant the security's forfeiture.

4.2 The Earnest Money shall be in one of the following forms:

- a) A bank guarantee issued by a reputed bank located in the country and valid for 6 (six) months.
- b) A Bank Draft/ FDR payable to **"ICAR- Unit- NIASM, Baramati"**.

4.3 Any tender not accompanied by Earnest Money will be straight way rejected.

4.4 Unsuccessful Tenderer's Earnest Money will be discharged or returned as promptly as possible

4.5 The Earnest Money may be forfeited:

- a) If a Tenderer/bidder withdraws its tender during the period of tender validity specified by the Tenderer on the Tender Form; or
- b) In case of a successful Tenderer/bidder, if they fails to furnish Security Deposit.

5. Performance Security

5.1 Within thirty (30) days, the successful tenderer shall furnish to the purchaser the Security Deposit equivalent to 10% of the purchase value.

5.2 The Security Deposit shall be in one of the following forms: (a) Bank Guarantee, issued by a reputed bank or a FDR/Demand Draft payable to **"ICAR- Unit -NIASM, Baramati"**.

5.3 Failure of the successful Tenderer/bidder to sign the contract and/or furnish the Security Deposit shall constitute sufficient grounds for the annulment of the award and forfeiture of the Earnest Money, in which event the Purchaser may make the award to the next lowest evaluated Tenderer or call for new tenders.

5.4 The Security Deposit will be discharged by the purchaser and returned to the Supplier following the date of completion of the Supplier's performance obligations under the contract, including any warranty obligations after receiving agreement letter.

6. Period of Validity of Tenders/quotations

6.1 Validity of Tenders/quotations shall be **180** days after the date of tender opening. A tender valid for a shorter period shall be rejected by the Purchaser as non-responsive.

7. Delivery and Documents

7.1 Delivery and installation of the system/services shall be made by the Supplier within 90 days from the date of placing order which may be extended at the discretion of the competent authority.

7.2 Documents to be submitted by Supplier are specified in technical specifications.

8. Transportation

10.1 The transportation costs etc. to transport the equipment to the consignee's place shall be borne by the tenderer.

9. Incidental Services

11.1 The supplier may be required to provide any or all of the following services, including additional services, as specified in Technical Specifications:

- a) Performance or supervision of on-site installation, etc. of the system.
- b) Furnishing of tools required for assembly and/or maintenance of the System.
- c) Furnishing of detailed operations and maintenance manual for each appropriate unit of system.

10. Warranty

10.1 **Warranty Clause: Minimum Three Years** from the date of installation. However more warranty period will be preferred.

10.2 The supplier warrants that the System and services provided under the contract are based on new, unused, latest, most recent or current models, and that they incorporate all recent improvements in design and materials unless provided otherwise in the contract. The supplier further warrants that all services/systems supplied under this contract shall have no defect, arising from design, materials, or workmanship except when the design and/or material is required by the purchaser's specifications or from any act or omission of the Supplier, that may develop under normal use of the supplied system in the conditions prevailing in the Board.

10.3 The purchaser shall promptly notify the supplier in writing of any claims arising under this warranty.

10.4 Upon receipt of such notice, the supplier shall immediately repair or replace the defective system without any cost to the purchaser.

10.5 If the supplier, having been notified, fails to remedy the defect (s) within a reasonable period, the

Purchaser may proceed to take such remedial action as may be necessary, at the supplier's risk and expense and without prejudice to any other rights which the purchaser may have against the supplier under the contract.

After Sale Service: The rates of Annual Maintenance Contract after completion of warranty period may be mentioned for five years.

11. Dispute Resolution Mechanism: If any dispute or difference arises between the purchaser and the supplier relating to any matter connected with the contract, the parties shall make every effort to resolve the same amicably by mutual discussions. However, if the parties fail to resolve the dispute or difference by such mutual discussion within 30 days, either the purchaser or the supplier may give notice to the other party of its intention to refer the same to arbitration. The arbitration shall commence thereafter. The arbitration shall be conducted by a sole arbitrator, who will be appointed by the Secretary, ICAR and the procedure to be followed in this respect will be as per the Indian Arbitration and Conciliation Act, 1996. The venue of the arbitration shall be the place from where the contract is issued.

12. You are also required to fulfill the following conditions and furnish the details as indicated in subsequent paragraphs.

- a) At the time of awarding the contract/order, the purchaser reserves the right to increase or decrease the quantity of goods, without any change in the unit price or other terms & conditions.
- b) Please indicate if you are currently registered with any Govt. organization and if registered, furnish all relevant details.
- c) Please states whether business dealings with you presently stand banned by any Government organization and if so, furnish relevant details.
- d) A supplier/ manufacturer shall not submit more than one quotation for the same set of goods.
- e) The supplier shall at all times indemnify the purchaser, at no cost to the purchaser, against all third party claims of infringement of patent, trademark or industrial design rights arising from the use of the goods or any part thereof, with respect to the goods quoted by the supplier in its offer.
- f) The quotation (s) as well as the contract shall be written in Hindi/English language.
- g) The contract shall be governed by the laws of India and interpreted in accordance with such laws.
- h) The Director, NIASM, Baramati reserves the right to reject any tender in part or full without assigning any reason thereof.

13. Contract: The technically qualified vendor who is awarded the order will have to submit acceptance letter within 15 days of issue of order and will supply material within the stipulated time given in purchase order as per the quoted specifications.

Annexure- I: Technical Specifications

Item No 1: Chemical fume hood

Specifications:

1. Chemical fume hood nominal size: 5ft/1.5 m
2. External dimension [WxDxH (inch)]: 50-65" X 30-40" X 60-70"
3. Internal work area [WxDxH (inch)]: 50-60" X 25-30" X 45-55"
4. Maximum sash opening 20-30", however it should automatically and gently fall back to the safe level of 15-20" level.
5. Face velocity: 0.4-0.5m/s (80-100 fpm) at full sash opening.
6. Exhaust velocity/static pressure required: 1390-1400cmh@50Pa; 800-820 cfm@0.20" WG at full sash opening.
7. Exhaust outlet diameter: 10-15"
8. Number of exhaust collar: one
9. Exhaust ducting work and connection accessories should also be quoted.
10. Construction:
 - 10.1. Tri wall construction for maximum safety and strength.
 - 10.2. Internal chamber should be constructed from stainless steel of 304 grades.
 - 10.3. Hood lighting system should be pre-wired, energy efficient; working light intensity should be 1050-1080 lux.
11. Electrical socket outlets: Two of 5/8 Amp
12. Electrical: 220-240 V, AC, 50-60 Hz.
13. A 3KV online UPS with 60 min. backup
14. Certification: ASHRAE and EN14175-3 standards, UL, EFI CE/UL certified.
15. Sash should be clearly labeled with operating instructions and illustrations.
16. Hood should have factory fitted valve and hose with wall mounted outlet for gas inlet, a vacuum inlet, water inlet, and nitrogen.
17. **Base cabinetry, 5 ft/1.5 m, for additional storage: -**
 - 17.1. Base cabinetry should be partitioned into four vertical cabinets with ventilation arrangement and auto exhaust.
 - 17.2. Lining of the cabinet internal walls should be made of special chemical resistant material, viz. PRL material with ASTM flame spread index <25.
18. Warranty: Three years after installation.

All vendors are requested to attach original technical literature/ catalogue in support of the mentioned specifications & highlight the above features.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 2: Homogenizer

Specifications:

1. Compact, table top model suitable for effective disruption and homogenization of wide range of samples of animal, plant, bacteria and yeast origin allowing consistent DNA, RNA, and protein yield in subsequent purification protocols for molecular biology applications.
2. Should allow simultaneous disruption of minimum 12 samples in short time and biomolecules degradation.
3. Should have provision for complete isolation and sealing of samples while processing to avoid cross contamination.
4. Should be able to disrupt multiple biological samples through high-speed shaking in plastic tubes with steel/glass beads.
5. Should have digital display and adjustable time.
6. Electric supply: 220-230V/ 50-60 Hz.
7. Following accessories should also be supplied: suitable adapter to accommodate minimum 12 sample tubes, compatible stainless steel beads (for 500 samples), compatible sterile nuclease free sample tubes 2 mL capacity (500 nos.).
8. Suitable high quality online UPS capable of providing at least 30 minutes of power back-up to equipment supplied to avoid protocol interruption and sample degradation upon power failure.
9. Warranty 2 years from the date of installation.

Vendors should attach original technical literature/ catalogue in support of the mentioned specifications and highlight the above features.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 3: Deep Freezer (-20°C)

Specifications:

1. Net Capacity: 600litres or more.
2. Temperature range: -20°C to -30°C. Freezer should be set to -20°C at the time of installation.
3. Upright type and solid single door model with self-closing doors. Freezer should have provision of forced air circulation for faster temperature recovery after door opening.
4. Freezers should be suitable for storing laboratory reagents and biological materials.
5. Four internal shelves and should be adjustable.
6. Integrated controller with digital temperature display and high/low temperature alarms, with audible and visible alarms for power failure, system failure.
7. Interior and exterior should be scratch resistant and painted.
8. Environmentally safe refrigerant mixtures CFC-FREE, HCFC-FREE non-flammable refrigerants should be used in freezer.
9. Certifications/compliance: UL and/or CE.
10. Automatic defrost to minimizing frost build-up and enable optimum cooling, alarm silence and automatic reset functions.
11. To prevent unauthorized alterations/changes in freezers settings, there should be key operated set point security system.
12. There should be battery operated backup system for alarm function in case of power failure.
13. Electric supply: 220-230V/ 50 Hz.
14. Suitable high quality voltage stabilizer with time delay function should be provided.
15. Warranty 3 years from the date of installation and on-site repair services as and when required.

Vendors are requested to attach original technical literature/ catalogue in support of the mentioned specifications and highlight the above features.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 4: Centrifuge

Specifications:

1. Centrifuge should be refrigerated.
 2. Temperature range: -10° to +40°C
 3. Centrifuge with fixed angle rotors for 24 X 1.5/2 ml tubes with 16,000-17,500 rpm speed
 4. Rotors 6 X 50 ml and adaptors for 15 ml with 7,500-9,500 rpm speed.
 5. Swing bucket rotors for 4X100-145 ml conical tubes/flat bottom with 4,000-5,000 rpm speed.
 6. Swing bucket rotors for microplate with 4,000-5,000 rpm speed.
 7. Rotor lids should have a Lock-system for secure lid closing and opening.
 8. Noise level should be less than 60 dBA.
 9. The centrifuge must be CE/ CSA/ UL certified and IVD Compliant with international standard.
 10. The centrifuge should be microprocessor controlled with bright advanced LCD display for speed, time, temperature, acceleration and deceleration.
 11. Electric supply: 220-230V/50 Hz
 12. All vendors are requested to attach original technical literature/ catalogue in support of the mentioned specifications & highlight the above features
- Warranty two years from the date of installation.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 5: pH Meter

Specifications:

1. pH measuring range: 0.00- 14.00
2. pH accuracy: ± 0.05 or better
3. pH resolution: 0.01 or better
4. Conductivity accuracy: $\pm 0.05\%$ or better
5. Conductivity resolution: 0.001 $\mu\text{S}/\text{cm}$ to 2000 ms/cm or better
6. Temperature range: 0- 100°C or better
7. Temperature accuracy: ± 0.1 or better
8. Salinity range: 0.00 to 50.00 ppt or better
9. Digital display
10. Calibration: Up to 3 points
11. The equipment should be equipped with the facility for the measurement of ion concentration
12. The equipment should be equipped with the facility for the measurement of dissolved oxygen
13. A good quality instrument cover should be provided
14. A minimal quantities of essential buffers, standards and electrolytes should be provided
15. Power 220-240 VAC $\pm 10\%$, 50 Hz AC
16. A standard factory calibration certificate should be provided.
17. The necessary operation manual should be provided along with the machine.
18. The firm shall submit necessary catalogues and product data sheets along with the offer.
19. The manufacturer must have a management system certified to ISO 9001.
20. Warranty: at least for two year from the date of installation.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 5.1: pH Meter

Specifications:

1. A high end pH meter is needed loaded with PC Software able to support Seven Excellence, Seven Compact, SevenMulti, SevenEasy, SevenGo pro and Seven Go Duo pro.
2. It should have Freely definable report format and Excel import of data
3. It should Support multi-result download from portable equipment and should have Graphical evaluation of measurement data.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 6: Real Time PCR

Specifications:

1. Peltier based thermal cycling for real time amplification of DNA/ RNA from samples
2. Licensed for real time PCR
3. Maximum ramp rate of 5°C/sec
4. Average ramp rate of 3-3.3C/sec
5. Accuracy +/- 0.2°C of programmed target at 90°C
6. Uniformity ±0.4 well-to-well within 10 sec of arrival at 90°C
7. Sample loading capacity- 96 well format. Should support 96 well plates, strips and tubes from multiple manufacturers.
8. Open system should support all common chemistries including SYBR green and TaqMan.
9. Should have provision to run regular PCR, preferably gradient.
10. Optical system should include excitation by minimum 5 filtered LED system and detection by minimum 5 filtered Photodiodes
11. High Resolution Melting (HRM) analysis.
12. At least five excitation and five detection filters.
13. Heating rate - 4°C/sec. or better.
14. Reaction volume 10-30 µl or more
15. Should be able to detect Cy5, FAM, VIC SYBR Green
16. Capable of multiplexing at least 5 dyes /well
17. Full compatibility with any standard or fast-cycling 384- or 96-well plates and reagents.
18. PC workstation, Monitor, Pre-installed windows and software for real-time analysis
19. Electrical approvals of IEC and CE
20. A compatible 2 KVA UPS with 60 minutes backup should be provided
21. The vendor should provide comprehensive onsite training on the operation of the instrument, chemistry options and software. This training should be provided free of cost.
22. System should be provided with at least 100 plates, 200 sealers and SYBR reagent sufficient for 2000 reactions of 30 µl volume reaction
23. Warranty: At least 3 years warranty.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specification mentioned above)

Item No 7: Gel Electrophoresis Unit (Vertical)

Specifications:

Vertical midi-format gel electrophoresis system includes electrophoresis cell (buffer tank, lid with power cables) suitable for precast/hand cast gels and all accessories (comb, spacer etc), staining trays with lids.

Gel capacity: 1-4 (ready and pre cast gel). Glass plate size:(W x L) 8 X 7 (± 0.5)cm. Comb :0.7 mm and 1 mm (minimum 4 each), Buffer tank capacity: 1000ml

Glass plates and combs should be labeled with thickness and number of wells for instant identification. Leak proof casting gasket.

PowerPac Basic power Supply:

Programmable power supply that fits broadest range of application & should be capable to operate four units simultaneously. The output range should be 0- 300 V, 2000-2500 mA, 1-500 W in 1 Watt steps. Constant voltage, current or power or constant temperature. Automatic Power up after Power failure. Timer 1-999 min.

Safety features: No-load detection, sudden load change detection, ground leak detection. CE compliance

Warranty: Minimum one year.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No. 8: Gel Electrophoresis (Horizontal)

Specification:

1. Use for single cell comet assay, DNA and protein separation.
2. Removable buffer circulation cassettes.
3. Inbuilt leveling mechanism.
4. Buffer requirement: 900-1000 ml.
5. Lid.
6. Tank with two dual male connectors per electrode and a leveling arrangement.
7. Two trays with slot to lift slides (each of size 20-22 (w) x 8.5-10 (L) cm for 8 slides and made of breakage resistant plastic.)
8. Two buffer distribution cassettes withdrawal and Deliver with attached tubing connectors

Additional items, accessories and modifications:

1. UV-opaque trays of different widths and lengths that compatible with comet assay.
2. UV-transparent tray with gel gripping design, with different widths and lengths
3. Extra comb stands and combs to cast gel with multiple combs.
4. Fixed height combs (To be used without the comb stand. These require slotted trays).
5. Gel-casting options for tape free casting
 - a. Gel-casting stand
 - b. Gel-casting blocks for casting gels of variable lengths
 - c. Gel-casting dams for casting gels in the tank (requires modified tank)
 - d. Trays with silicone gaskets at the ends to cast gels in the tank
 - e. Trays with slots to fit plastic dams with silicone gaskets
6. Combs of varying thickness (1 mm, 1.5 mm, 2 mm, or 3 mm)
7. Penta-legged leveling table with spirit-level
8. Warranty should be at least 2 years

Power Supply

1. Output range upto 220V, 500 mA
2. Dual mode (CV and CC) with auto crossover
3. Two outputs (independently monitored)
4. Independent digital displays for mA and volts (resolution 1 mA, 1 V)
5. Can be set to any desired value within range
6. Special MOSFET load sharing circuitry
7. Protection of outputs against short-circuitry
8. Over-voltage trip circuit to limit electronic component damage
9. Protection of outputs against short circuiting
10. Over voltage tripping circuit to limit electronic component damage
11. Spike guard

12. Warranty should be at least 2 years

Peristaltic Pump

1. Peristaltic pump with variable speed and silicon tubing.
2. Bi-directional continuous operational.
3. LED display and timer.
4. Flow rate 400-470 ml/ min silicon tubing with 7 mm diameter.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 9: Plant Growth Chamber

Specifications:

Minimum growth area of 4-5 Sq.m, controlled temp (5°C to 45°C), RH (40-90%), light intensity of 1000-1200 umole/m²/S, fully programmable with controllers having real time user interface to create single day/ multiple day schedule with digital displays and password security protection , complete with all support system and warranty.

1. CONTROL SYSTEM:

- Advanced control system. All of the input, output and Ethernet communication components should be integrated on the controller.
- Multi-colour touch screen controller.
- RTD temperature sensor input: Programs should be able to run in real time, ramping or non-ramping mode.
- Multiple programs should be link together to simulate natural conditions.
- Two calibration offsets per input channel should be provided.
- Light lifetime maintenance: the accumulated hours of each light output should be activated and reset.
- Programmable outputs should allow for user specific control requests and the In-built Help system should provide the necessary help with settings and programs.
- Controller should be password protected.
- Wireless or Ethernet port should provided communications via a local network or Internet. The Controller should be accessed directly from the network or Internet, without the need for intermediate computer.

2. PROGRAM AND DATA LOGGING SOFTWARE: should have the following features-

- Ethernet or wireless connectivity: data management and remote programming and integrated data collection.
- Viewable current or archived data-log files while continuing to log current data without disruption. Graph should be viewable in 6, 12, 24 hours or one week increments.
- Programmable reading rate: from 5 minutes to 24 hours with programmable steps from 1 minute to 24 hours with ramp, soak and sequencing capabilities.
- Computer with latest software upgrade suitable data handling analysis should be included.

3.0 CONSTRUCTION DETAILS REQUIRED:

- Exterior dimensions: (W) 110-130" x (D) 60-80" x (H) 100-115".
- Interior dimensions: (W) 95-105"x (D) 60-65" x (H) 80-90".
- Growth area: 40-45 ft². Growth Height: 75-80" between perforated aluminum channel floor and the lamp bank barrier.
- Insulation: The insulation should be "foamed-in-place" polyurethane with a 97% closed cell structure. Overall thickness shall be 4" with an R factor of 34. The polyurethane insulation must retain dimensional stability in an operating temperature range of -40 degrees F (-40 deg. C) to 250 degrees F. (121.1 deg. C).
- Doors : The room should have one or two front doors. Each door is a flush type for a 30-35" x 75-80" door opening. It is provided with a magnetic snap-in perimeter gasket, self-closing cam lift gravity hinges, and a key lockable latch handle with an inside safety release.

4. Observation window: A thermal-pane 10-14" x 10-14" is provided for interior viewing. Light tight cover provided.

- Cabinet construction: All rooms are built in panel sections. Each section consists of 3-5"-thick urethane insulation, metal interior and exterior surfaces, cam-type fasteners and vinyl gaskets.
 - Finish: Standard metal exterior should be made up of with white galvanized steel or mild zinc steel, interior wall and ceiling surfaces should be constructed with smooth steel with a baked white enamel finish.
 - Floor: Insulated floor provided with center drain exiting at front or rear of chamber.
5. **Dimmable Programmable Lighting:**Total adjustable 3 tier rack on each side (Total 6 racks) of the walk-in chamber with following combination of multitask and multi lights oriented
- **Required lights intensity: 1000-1200 $\mu\text{moles}/\text{m}^2/\text{sec}$**
 - Required Lamps: Balance spectrum for plant growth plus extended life tungsten incandescent lamps and/or ceramic metal halide lamps.
 - Programming and control of fluorescent lamps and/or ceramic metal halide lamps: Min 3 levels programming of fluorescent lamps and 2 levels of programming for tungsten incandescent lamps.
 - Lamp heat exchangers should be provided to dissipate lamp heat
 - Required light barrier: The barrier is a transparent surface to provide uniform intensity to all portions of the interior and may be easily removed for cleaning or replacement with optional spectral filters.
 - Three sets of additional fluorescent lamps and ceramic metal halide lamps should be provided.
6. **COOLING/HEATING SYSTEM:**
- Condensing unit: remote air cooled condensing unit with hot gas by-pass system for continuous compressor operation, extended life and close temperature control.
 - Refrigeration Valves: Solenoid type with extended stem for long life and quiet operation. Heating: Via hot gas and electric heaters.
 - Evaporators: Laminar air flow or copper tube construction and aluminium fins. Dual evaporator's coils: One coil in each side wall of the chamber to maximize chamber performance.
1. **Should include the following air flow:**
- Air Flow: Uniform vertical downward air flow.
 - Fresh air: An adjustable air exchange system to provide 0 to 20 air changes per hour.
 - Air flow over dual coils provides better temperature uniformity throughout the chamber.
2. **Essential Temperature Control Systems :**
- **Temperature range: Should be between 10° to 44°C ($\pm 1^\circ\text{C}$) lights on and 4° to 44°C ($\pm 0.5^\circ\text{C}$) lights off.**
 - Temperature uniformity: $\pm 1.0^\circ\text{C}$
3. **Humidity Control System:**
- Relative humidity range: 40% to 90% in temperature range of 15° to 30°C.
 - Additive control of humidity by spray nozzles or ultrasonic generator humidity system.
 - The Dehumidifier should consist of electrical heaters and two dehumidifying evaporators or condensation on the cooling system evaporation.
 - Suitable RO System should be provided with chamber.
- 10. TEMPERATURE SAFETY LIMIT CONTROLS FOR EXPERIMENT PROTECTION:**
- Adjustable high and low temperature controls, audible alarms and visual indicators should be provided.
 - Dry-alarm contacts should be provided on all the units for remote connection to monitoring system.
11. CO₂ package with CO₂ sensor of 2000-3000 ppm with CO₂ cylinder and regulator
12. Reputed international manufacturer preferably from USA/Canada/Europe.
13. Quality test data to be provided of testing of machine with manual.
14. Operation manual, service wiring detail to be provided with machine.

15. Door locks with keys. Additional external temperature safety controller with independent temperature sensor for experiment safety.
16. Observation window with door for experiment viewing without opening the door.
17. **ELECTRICAL REQUIREMENTS WITH THREE PHASE VOLTAGE STABILIZER:**
 - Chamber requirements: 280V/380V/440V/3-phase/50/60 Hz, 4 wire plus ground.
 - Chamber disconnect switch: Electrical lockable disconnect at room will be provided.
 - Condensing unit requirements: 280V/380V/440V/3-phase/50/6 Hz, 3 wires plus ground.
 - Condensing unit disconnect switch: Electrical lockable disconnect near condensing unit will be provided.
18. **Warranty three years after installation.**

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 10: Biosafety Cabinet

Specifications:

1. Cabinet should be class II type A2
2. Front Glass Opening: 7 - 10 inch.
3. Internal Dimensions (W x H x D): 4 ft x 2.5 ft x 2 ft approx.
4. Filter: MPPS >99.99%, H14 HEPA EN 1822.
5. Certifications/Compliance: CE listed, NSF/ANSI 49 certified for Class II, Type A2 conditions.
6. Noise should not exceed 65 dBA.
7. Interior and Work tray: made of single piece stainless steel.
8. Front: Ergonomically sloped with UV absorbing/UV protective glass.
9. Provision of service valves for gas, air and vacuum.
10. Cabinet to be provided with stand and detachable arms rest.
11. UV lamp: factory installed with programmable UV light,
12. Visual and audible alarm for indicating improper front window working position, and airflow restrictions.
13. Provision for reduced speed operation when front window is closed.
14. Provision of interior lighting and at least one 230V plugs/receptacles on interior side.
15. Provision of independent pressure sensors to detect changes in inflow/exhaust or down flow with alarm signals.
16. Electric supply: 230V/ 50-60 Hz.
17. Warranty 2 years from the date of installation.
18. Suitable high quality online UPS capable of providing at least 30 minutes of power back-up for biosafety cabinet to be supplied.

Vendors should attach original technical literature/catalogue in support of the mentioned specifications and highlight the above features.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 11: Multi Parameter portable water quality kit

Specifications:

Multiparameter water proof portable pH / m V / Ion / Conductivity / TDS / Resistivity / Salinity / Dissolved Oxygen hand held meter with pH electrode and Ion selective electrode for Ammonia (NH₃ detection limit of 0.01 to 17000 ppm Ammonia), 4 cell Conductivity probe, Dissolved Oxygen probe, DAS software, power adapter & carrying kit set (all probes have 3 m cable length). Simultaneously measures and displays four parameters. View individual parameter details at the press of a button. Measure accuracy of up to ± 0.002 pH and resolution of up to 3-decimal points, 2-cell and 4-cell Conductivity probe, enabling it to measure a wide conductivity range of up to 500 mS/cm – meter even measures pure water, Ion measurement capabilities with 3 digit resolution and 8 calibration points, Measure 90.00 mg/L in DO concentration and 600 % in DO saturation. Rugged and waterproof for application in harsh environments, Step-by-step prompts that guide users through set-up, calibration and trouble-shooting, High/low alarm limits, Meter automatically logs up to 500 readings with time and date in GLP-compliant format, RS 232 through LED , USB / IrDA Interface Adapter, Non-volatile memory protection for information and meter settings, even when batteries run out, Password protection to prevent tampering. One extra set of Consumable for pH standards and DO (membrane), and conductivity probes and ammonia probe to be supplied. Warranty 3 years on meter against manufacturing defect and 6 months for electrode.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 12: Analytical balance

Specifications:

An analytical balance for precision weighing of chemicals to prepare the microbiological media is required with the following specifications

1. The balance should have a weighing capacity from 1.00 mg to 200 grams/ 0.0001-200 grams.
2. It should have Built-in function for balance leveling. The built-in Level Control function should be able to issue a warning when the balance is not level and provide on screen guidance to help the user level the balance correctly within seconds.
3. The balance should have large color touch screen for comfortable operation and should have warning functions for valid and invalid weighing results.
4. It should display digits turn red if the net sample is below a pre-programmed minimum value.
5. The balance should have Passcodes to protect balance settings.
6. It should have password protected access
7. It should have Easy-cleaning features to save time and effort
8. It should have movable walled fibre or glass protection for minimizing the external errors during weighing
9. It should have tare function for reducing the time for weighing separate samples
10. It should have weigh mode switch function for selection of preferred weighing unit (mg/gm).
11. Warranty for 3 years

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 12.1: Analytical balance

Specifications:

An analytical balance for precision weighing of chemicals to prepare the microbiological media is required with the following specifications

1. The balance should have a weighing capacity from 1.0 mg to 200 grams/ 0.0001-200 grams.
2. It should have Built-in function for balance leveling. The built-in Level Control function should able to issues a warning when the balance is not level and provides on screen guidance to help the user level the balance correctly within seconds.
3. The balance should have large color touch screen for comfortable operation and should have warning functions for valid and invalid weighing results.
4. It should display digits turn red if the net sample is below a pre-programmed minimum value.
5. The balance should have Passcodes to protect balance settings.
6. It should have password protected access
7. It should have Easy-cleaning features to save time and effort
8. It should have movable walled fibre or glass protection for minimizing the external errors during weighing
9. It should have tare function for reducing the time for weighing separate samples
10. It should have weigh mode switch function for selection of preferred weighing unit (mg/gm). Warranty should be 2-3 years w.e.f date of installation.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 13: Microscope (Light)

Specifications:

1. A Research Fluorescence (light) Upright Microscope with transmitted light LED at least 5W illumination with long life of 1,00,000 hours is needed for routing microbiological work.
2. It should have 3-step focus drive coarse, medium & Fine adjustment with focus torque adjustment
3. It should have Objective nosepiece for 6/7 or better objectives
4. The DIC turret should be available with empty DIC slots.
5. System should have Infinity corrected Optical System
6. The Condenser should be at least 0.90/1.25 Oil, Colour Coded with Condenser lens & possibility to accommodate for DIC prism, Phase rings with rotatable Polarizer & analyser.
7. The X/Y mechanical stage should work as right hand operation and left hand operation.
8. It should have a trinocular phototube with beam splitter.
9. It should have Eyepiece pair 10x/20 or better
10. It should have Infinity corrected Objectives suitable for Phase & Fluorescence: 4x, 10x ph, 20Xph, 40x & 100x (oil). Immersion Oil.
11. A suitable dust protective cover for the complete unit should be supplied.
12. The quoted model should be upgradable for fluorescence etc.
13. The vendor should ensure to supply a scientific (dedicated for microscopy) Digital Colour HD CCD, CMOS or better Camera with High definition & Resolution 10MP or better, with a provision for software interpolation, 1/2.3" scan with software kit, color filter RGB, 30 fps with full HD and live image full display. Fire wire or USB connection to PC which should be upgradable to other s/w modules in future. Preview images on an HD monitor, Projector, Saving should be directly on SD card & SD card to be supplied.
14. The camera and microscope should be controllable through single software.
15. Microscope, camera and software should be offered from a single manufacturer for better synchronization.
16. Latest best suitable PC to be supplied as per camera requirement along with the graphics card.
17. Vendor should ensure at least 24 months warranty w.e.f date of installation
Vendor should attach list of user for this model and all the technical documents in support of technical bid

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 14: Viscosity Meter

Specifications:

A viscosity meter is required for viscosity measurement of microbiological samples at different shear rates. The equipment should have following options

1. It should utilize very small amount of sample (less than 1 mL)
2. The temperature range should be from -20 or less to 100°C or more (Peltier-type temperature control required)
3. It should be compatible with highly corrosive samples
4. It should be supplied with appropriate software for automated determination of molar mass, intrinsic viscosity, relative viscosity and other polymer-specific parameters
5. The speed range, in case of spindles should be from 5rpm or less to 1000rpm or more
6. Viscosity range should be from 0.2 poise or less to 15000 poise or more
7. The range of shear rate Sec^{-1} should be 10 or less to 13000 or more
8. It should be mercury free
9. It should be supplied with the set of necessary accessories e.g. spindles/piston, etc.
10. It should have CE/ISO/ equivalent certification
11. It should have at least 36 months warranty.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 15: Ultra Sonicator

Specifications:

A high end digital cell ultra-sonicating probe based machine is required for disrupting the microbial cell and degassing the solvents with the following specification

1. The system should have different probes to be used for degassing of solvents and disruption of microbial cells
2. It should be fully microprocessor controlled and completely programmable
3. It should have temperature indicator and controller ,time setting provisions
4. It should be supplied with Integrated Sound reduction chamber to reduce cavitation sound produced during processing
5. It should have digital parameter entry for precise, easy setup
6. It should have inbuilt auto tuning for optimum control in any application.
7. It should have both continuous and pulsed operation.
8. It should have a LED readout displays parameter settings during setup and operation for easy and user friendly reference and monitoring
9. It should be able to adjust a total processing time ranges from 1 second to 99 hours
10. It should be supplied with tooling which may be ideal for Falcon style vessels
11. All the probes from low to high sonication power to sonicate small and large volume of the samples
12. Vendor should ensure at least 36 months warranty w.e.f. date of installation.
13. Vendor should supply all of the technical documents for cross confirmation of specification compilation sheet provided by them.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 16: Hot air oven

Specifications:

A triple walled hot air oven is needed for routine drying and sterilization of glassware at high temperature (250 °C). It should have gravity convection; thermal processes to ensure the efficient heating. The oven should ensure fast, uniform drying of glass wares and other laboratory materials.

1. It should have temperature range: Ambient + 5 °C to 250°C
2. It should have a temperature accuracy: $\pm 1^{\circ}\text{C}$
3. Capacity/Size: 250 Litres.
4. The oven should have uniform circulation even under full load with the help of Air heaters with Dual stage interlocking facility and the Air circulating fan for temperature uniformity inside the chamber and Homogeneous temperature conditions throughout loaded material
5. Thermal gradient controlled mechanism.
6. Maximum occupational safety Easy loading and unloading of specimen material and should have very tight door closure. It must have thick insulation for low heat dissipation and rack should be with tilt protection.
7. It should not have permanent fixtures to facilitated the easy cleaning
8. It should have at least 7 inch Touch screen Colour Display
9. It should made up of high-quality materials and Fiber molded door unit
10. Safety features: It should have over temperature protection and power fluctuation protection.
11. Control panel should consists of main switch along with the indicating lamp, control switch etc. It should have LAN based operation facility for fault detection & Web gate technology for remote access. Timer & Parameter control, Alarm : Indicate temperature more than 5°C from set points, and when timer operation has expired (emergency condition), Emergency switch at rear end to avoid accidents
12. It should have option to stacked Units up to two no. for growing numerous applications
13. It must have warranty period of at least 36 months

Vendor should submit all the technical documents in support of specifications compilation sheet provided by the vendor.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No. 16.1: Hot Air Oven

Specifications:

1. Capacity volume: 400 ± 25 L
2. Operating Temperature Range : 50°C to 200°C or higher
3. Heating and drying through mechanical convection or choice of both mechanical and gravitational convection.
4. Flexible shelving system with minimum 2 shelves and provision for additional shelves
5. Chamber interior made up of corrosion resistant materials such as stainless steel (AISI 304)
6. Adjustable fan speed
7. Digital display
8. Timer Functions
9. Automatic temperature alarm
10. Microprocessor controlled
11. RS 232 interface
12. Programmable
13. Temperature uniformity within chamber volume ($\pm 3.0^{\circ}\text{C}$)
14. High temperature stability over time
15. Low heat emission and low external surface temperature
16. Certification of international standard such as DIN compliance
17. Access port for introducing external sensors inside the chamber
18. Warranty 2 years or more.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 17: Vacuum pump

Specifications:

A vacuum pump is required for routine laboratory protocols involving filtration, aspiration, desiccation, vacuum drying, water aspiration, etc. The equipment should have following options

1. It should support at least 6 funnels for the activities like filtration, aspiration, vacuum drying, etc.
2. It should have flash holder and round bottom flask for generating the vacuum
3. It should be able to generate 7-9 mbar vacuum or more to generate vacuum for 6 flasks at a time attached in sequence.
4. It should have intake catch jar, exhaust catch jar, adjustable vacuum/gas ballast, a knob for vacuum and pressure adjustment, vacuum gauge, etc.
5. It should have inlet water trap facility for protection of the pump from accidental ingestion of water
6. It must be made up of corrosion – free material and compatible for materials used in the life science laboratory
7. It should have inbuilt pressure gauge for fixing the required vacuum
8. All the accessories viz, hose pipe, rubber and steel clips and locks etc. must be supplied
9. Weight should not be more than 15 Kg
10. It must have warranty period of at least 36 months

Vendor should submit all the technical documents in support of specifications compilation sheet provided.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 18: Microscope Fluorescent

Specifications:

Research microscope with stand for biology with transmitted light LED at least 4W illumination with long life of more than 1, 00,000 hours.

1. 3-step focus drive coarse, medium and fine adjustment with focus torque adjustment
2. Objective nosepiece for 6/7 or better objectives. Quadruple or better resolving nosepiece
3. DIC turret to be available with empty DIC slots.
4. Infinity corrected/harmonic corrected (HC) optical system
5. Ergostage with vernier reading ergo stage made up of ultra hard ceramic surface with slide holder for ergo stages. For one hand slide exchange.
6. Universal condenser 0.90/1.25 oil, colour coded with condenser lens and accommodation for DIC prism, phase rings with rotatable polarizer and analyzer.
7. X/Y mechanical stage either for right hand operation or for left hand operation.
8. Trinocular phototube with viewing angle 20-30° and beams splitter position vis / phot; 3 switching positions 100% : 0%
9. Provision to adapt two cameras simultaneously.
10. Eyepiece pair 10x/22 or better- focusable and adjustable and provision for eye piece 16 x / 14 B, 25 x & 40 x adjustable.
11. Immersion oil – 30-50 ml
12. Infinity corrected objectives suitable for DIC, phase and fluorescence: Fluorite / Semi Apo, 4x, 10x, 20X, 40x and 100x (oil). objectives should be with fluorescence capability or better
13. Dust cover for the complete set
14. Ultra high pressure Hg-Lamp, HG 100W, fluorescence filter turret should be at least 5 positions or more. Along with 5 or more position.
15. Neutral density filters to control fluorescence intensity to incorporate into the microscope.
16. Fluorescence zero pixel shift free filters for DAPI, FITC and TRITC with band pass.
17. Compatibility with comet assay procedure.
18. Warranty should be at least 3 years after installation.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 19: Magnetic Stirrer with hot plate

Specifications:

1. Speed: 100-1500 rpm
2. Maximum stirring volume (liquid): 2-5 litres
3. Plate temperature regulation range: 30°C to 200°C
4. Working plate heating time till 200°C: 15-20 minutes
5. Diameter of working plate: 150-160 mm
6. Working surface material: Aluminium alloy/rust free material
7. Length of magnetic stirring element: 10-15 mm
8. Fault indication: Audible sound signal/automatic turn off
9. Nominal operation voltage: 230 V or 120 V and 50/60 Hz
10. Two years warranty after installation

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 20: Magnetic Stirrer with Temperature Control

Specifications:

Speed range: 0-1000 rpm or better

1. Temperature range: at least up to 350 degree C
2. Capacity: greater than 15 kg
3. Ceramic platform with minimum 180 inch² usable dimension
4. Digital display and timer
5. Should be operated with power 220-240 VAC \pm 10%, 50-60 Hz
6. Supplied with stir bars
7. A standard factory calibration certificate should be provided.
8. The firm shall submit necessary catalogues and product data sheets along with the offer.
9. The manufacturer should have a management system certified to ISO 9001.
10. Warranty: minimum 2 years

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 21: Top Pan Balance

Specifications:

Large LCD display with backlight.

- Function buttons/icons should be present and clear.
- Top pan balance should have capacity of 100-500 g.
- Automatic calibration should be available despite of temperature variations.
- It should display capacity tracker during weighing.
- Readability should be 0.001 g.
- Keypad should be easy to use.
- Pan should have diameter between 80 to 180 mm.
- Instrument should have at least 2 years warranty period.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 22: Automatic blood Analyzer

Specifications:

Convenient and safe to use: Fully automatic integrated self-cleaning system for minimum maintenance. Cyanide free reagents to avoid environmental risks.

1. Compact size requiring small bench space. Large colour LCD display features intuitive communication Built-in thermal printer.
2. High reliability and accuracy: Independent counting system for each species to ensure high accuracy.
3. Fully integrated calibration and quality control programs for at least following parameters: WBC, RBC, HGB, HCT, MCV, MCH, MCHC, RDW, PLT, MPV, PDW, PCT
4. Multispecies additional parameters for Dog, cattle, Horse, Sheep, Goat, Mouse, Rat and rabbit or other species also.
5. Histograms for WBC, RBC and PLT.
6. Principles should include electrical impedance method for counting and cyanide free method for Hemoglobin or other advance methods.
7. Sample Volume: prediluted ≤ 20 ul, Whole blood ≤ 15 ul.
8. Throughput: at least 25 samples per hour
9. Display: Colour LCD/LED display
10. Resolution : 640 X 480
11. Carryover: WBC,RBC,HGB $\leq 0.5\%$, PLT $\leq 1\%$
12. Input /Output: RS232 X 2, 1parallel printer, 1 barcode scanner, 1 keyboard and their interface.
13. Printer: Thermal recorder, 50mm or more width paper, various printout formats along with printer.
14. Operating environment: Temperature: 15°C - 40°C
15. Humidity 30%-85%
16. Power Requirement : 100-240V \sim 50/60 Hz
17. Dimension 320 ± 50 (W) X 440 ± 50 (H) x 390 ± 50 (D)
18. The machine should accompany UPS (for at least 1 hr) in case of power interruptions.
19. There should be a warranty period of two years for repair and maintenance.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 23: Microtome

Specifications:

Rotary Microtome designed for all applications of paraffin and hard specimens in research.

1. Consistent sectioning speed
2. Sectioning of large size cassettes and should supports safer specimen changing
3. Knife holder accepts either high or low profile disposable blades.
4. Calibrated controls for precise specimen orientation.
5. Disposable Blade carrier universal cassette clamp
6. Sectioning range: 0.5 to 100 μ m trim
7. Trimming increment: 10u, 50u or more
8. Section resolution 5 to 500 μ m
9. Electrical requirements 115V 60 Hz
10. Digital display to monitor a range of functions including cutting speed section count section thickness.
11. There should be a warranty period of two years for repair and maintenance.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 24: BOD Incubator

Specifications:

A Triple walled constructed incubator for bacteriological research, highly suitable to culture the bacteria and fungi the Incubation temperature ranges from 4 - 50 °C is required. It should be supplied with following specifications

1. Chamber volume 450 litres or above
2. Door should have a glass / acrylic peeking window to allow inspection of samples without disturbing the internal temperature of cabinet.
3. Temperature Sensitivity ± 0.1 °C
4. Safety features should be available for over temperature protection and over electric power protection.
5. On board firmware for UV decontamination should be provided
6. Control panel should consists of main switch along with the indicator lamp, control switches, etc. having LAN based operation facility for fault detection and Web gate technology for remote access
7. Air heaters with Dual stage interlocking and air circulating fan for temperature uniformity inside the chamber must be available
8. The cooling should be through hermetically sealed CFC FREE eco-friendly compressor with interlocking applied for zero downtime facility
9. It should have thermal gradient controlled mechanism
10. It should have at least 5-7 inch Touch screen Colour Display
11. Alarm : Indicate temperature more than 5°C from set points, and when timer operation has expired (emergency condition)
12. Emergency switch at rear end to avoid accidents should be available
13. Shelves Number to be Supplied : minimum 6
14. Should have high and low temperature protection
15. Gasket door with key lock for safety and security
16. Easy-to-clean, corrosion-resistant construction
17. A suitable stabilizer should be supplied to control the power fluctuations during the operation
18. The vendor should provide a specification compilation sheet clearly mentioning for the deviations or better than the indenter`s specifications if any
19. The vendor should submit the entire technical document related to the equipment or model quoted for cross confirmation of specification compilation sheet provided by the vendor.
20. The vendor should ensure at least three year warranty

It should be highly suitable for any application **(Particularly for incubation of microbial plate to culture the bacteria and fungi at required suitable temperature)** that requires a temperature setting at or below the ambient temperature of the laboratory. The unit is microprocessor controlled and features push button temperature set-point selection, high and low temperature protection, and an easy to read digital display.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No. 25: SPAD Chorophyll Meter

Specifications:

1. Measurement subject : Crop leaves
2. Measurement Method: Optical density
3. Measurement area : 2 mm X 3mm or more
4. Subject thickness: 1.2mm or more
5. Subject insertion depth : 12mm or more
6. Receptor: 1 SPD
7. Display : LCD panel showing 4-digit measurement value
8. Display range: -9.9 to 199.9 SPAD units
9. Power source : 2 AA size alkaline batteries
10. Temperature drift : within ± 0.04 SPAD units
11. Operating temperature/ humidity range: 0 to 50 °C, RH of 85% of less (at 35 °C)
12. Storage temperature / humidity range : -20 to + 55 °C, RH of 85% of less (at 35 °C)
13. With warring buzzer ; user compensation factor
14. Standard accessories: Depth stop strap 2 AA alkaline batteries soft case regarding checker.
15. A Standard factory calibration certificate should be provided.
16. The firm shall submit necessary catalogues and product data sheet along with the offer.
17. The manufacturer should have a management system certified to ISO 9001.
18. Warranty: Minimum 3 years.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No. 26: Sonicator

Specifications:

1. Equipment should be used clean test sieves of \emptyset 200 x 50 mm/ 8" x 2" with maximum frequency at 35 kHz.
2. Instrument should have bath capacity of min 40 liters and above
3. Tank dimensions should be more than(>) approx 495 x 290 x 290 mm
4. Instrument should be suitable to clean minimum 5 test sieves of \emptyset 200 x 50 mm/8" x 2" at a time
5. Timer setting should be available
6. Suitable basket and lid to be provided
7. Power requirement 220-240V/50-60 Hz
8. A standard factory calibration certificate should be provided.
9. The firm shall submit necessary catalogues and product data sheets along with the offer.
10. The manufacturer should have a management system certified to ISO 9001.
11. Warranty: Minimum 3 years.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 27: Reciprocating Shaker

Specifications:

1. The shaker should have a capacity to run at least 20 number of 1000 ml Conical flask at a single time
2. It may either be a table top model or non-table top model
3. A platform fitted at the top of the machine to hold samples should be with provision of manual adjustment facilities.
4. The platform size may vary range from 15to 25"x 30-40"x 10-15"
5. It should be able to work on 220/230 volts A.C. supply
6. It should be able to programme the speed (RPM) and if possible time also. The machine should able to run shaking speed ranges from 50-250 rpm.
7. It should have a running motor of 0.25 or 0.5 HP capacity
8. For sophistication, it may be purchased with digital display and alarm feature. Otherwise, conventional model is sufficient enough for usage.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 28: UV-Visible spectrophotometer

Specifications:

It should be a multi-sample micro-volume UV visible spectrophotometer (MultiprobeNanodrop System)

1. It should have a facility for micro-volume pedestal with capability of measuring sample volume of less 1 μ l of DNA RNA and proteins directly.
2. Should have the capability of analyzing four to eight samples at one time
3. Path length of 1mm or less
4. Light source Xenom lamp or better.
5. Wave length range 200-800nm or better or 1100 nm.
6. Wave length accuracy 1nm
7. Lower range detection limit of less than 5ng/ μ l of ds DNA
8. Higher range detection limit of 3500 ng/ μ l to 4000 ng/ μ l.
9. Measurement time of less than 25 seconds.
10. Should have a software compatibility with Windows XP or Vista (32 bit and or 64 bit)
11. Should be accompanied by a computer and operating softwares compatible with the above mentioned operating system.
12. Should be supplied with a UPS system of minimum 3KVA wattage.
13. Minimum of One year warranty from the date of installation.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No. 29: Comet software with dongle

Specifications:

1. Comet assay kinetic imaging software system to be provided.
2. Branded PC/ work station with i7 processor and hard disk 2TB and 8GB Ram compatible with the software comet.
3. 24-30" LED Monitor
4. 19" Square Monitor and 3-4 GB graphics card extra.
5. Large Field of view options- score several cells per image.
6. Databases include all comet images, parameters and audit trails
7. Supplied with database viewer for data audit, archive and summary for reporting and statistical significance testing
8. Software should scores live images from any camera.
9. Fully automatic or interactive computation of head/Tail% DNA, Tail Length, Olive Tail moment, etc.
10. Scoring can be suspended and resumed in multiple sessions.
11. 3 years warranty for software and dongle.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No. 30: Real Time PCR

Specifications:

1. Peltier based thermal cycling for real time amplification of DNA/ RNA from samples
2. Sample loading capacity- 96 well format. Should support 96 well plates, strips and tubes from multiple manufacturers.
3. Open system should support all common chemistries including SYBR green and Taqman.
4. Optical system should include excitation by LED system and detection by Photodiodes/CCD camera
5. High Resolution Melting (HRM) analysis
6. At least five excitation and five detection filters
7. Heating rate - 4°C/sec. or better
8. Reaction volume 10-30 µl or more
9. Should be able to detect Cy5, FAM, VIC SYBR Green
10. Capable of multiplexing at least 5 dyes/well
11. Full compatibility with any standard or fast-cycling 384- or 96-well plates and reagents.
12. PC workstation, Monitor, Preinstalled windows and software for real-time analysis should be provided if system can be controlled by external computer. Computer system with 4th Generation Intel Core i7 Processor, Processor frequency at least 3.6 GHz, 8 GB Ram memory, At least 1 TB hard drive, and monitor 21.5" should be provided.
13. A compatible 3 KVA UPS with min. 60 minute backup should be provided
14. The vendor should provide comprehensive training on the operation of the instrument, chemistry options and software. This training should be provided free of cost.
15. System should be provided with at least 300 plates, 300 sealers and SYBR reagents including cDNA synthesis components, sufficient for 2000 reactions of 50 ul volume reaction
16. Warranty: At least five year warranty.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No. 31: DSLR Camera

Specifications:

A high end DSLR camera is needed for quality picture for documentation of microbial culture and experiment observations with following features.

1. It should have resolution at least 36 mega pixels or higher
2. A good quality vibration reduction lens for better image capture should be quoted as optional item
3. It should have custom picture control facility covering maximum diverse modes
4. It should have at least two card slots for backup and storage of data
5. It should be compatible with divers type of lenses
6. It should have inbuilt flash and additional compatible flash may be supplied as an optional accessories
7. It should have inbuilt display of minimum 8 cm or above
8. It should have inbuilt USB port (USB 3.0 or better along with the connector)
9. It should supplied with one additional rechargeable battery for emergency backup
10. It should have inbuilt GPS sensing ability or an external high-end compatible GPS sensing Unit should be supplied
11. Camera should be supplied with a good quality dust protective cover, Battery Charger with either an AC wall adapter or power cable of a type and shape that is compatible to India, USB Cable Clip, and HDMI Cable Clip, USB Cable and other necessary accessories and software CD etc.
12. A tripod stand for holding the camera should be quoted as an optional item
13. All necessary accessories should be supplied with the camera
14. Vendor should ensure at least 2 year onsite warranty w e f date of delivery.
15. All the technical documents should be supplied with technical bid

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No. 32: Micropipette set

Specifications:

A high accuracy micropipette set is required for precise reagent pipetting during routine laboratory protocols. The set should include -

1. Highly precise autoclavable micropipette set with the micropipettes having capacity ranging from minimum 0.1 μ L to 1000 μ L (.1-2.5, 2-20,10-100,100-1000 μ L) and 1- 10 ml
2. The micropipettes should have the tip cone design compatible with the tips from multiple brands
3. The micropipettes should have second-push longer enough for highly efficient dispensing
4. The micropipettes should have user-friendly, in-house calibration system without any special tools
5. The micropipettes should tolerate autoclaving temperature and should be resistant to UV
6. The micropipettes should have special provisions for appropriate protection against physical and chemical corrosion
7. The volume display should be visible during pipetting
8. The micropipettes should have easy identification color-coding system
9. There should be provision of shelf mounting stand for proper storage and handling
10. There should be individual quality certificate (QC) along with the calibration report for individual pipette following ISO 8655 with CE/IVD or equivalent compliance.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No. 33: Liquid Nitrogen Storage Vessels

Specifications:

1. **Liquid Nitrogen Capacity:** Liquid nitrogen vessels should be of 1 liter, 2 liters, 5-6 liters (two quantities each) and 20-30 liters (two quantities) LN2 storage capacity.
2. **Neck diameter:**5-6 cm for 5-6 liters and 20-30 liters LN2 vessel; 10-15 cm for 1 and 2 liters containers.
3. **Static evaporation rate:** 0.15-0.20 L/Day for 5-6 liters vessel and 0.15L-0.30/Day for 20-30 liters vessels.
4. **Withdrawal device:**20-30 liters vessels should be with withdrawal device
5. **Wheeled Accessory Cart:** 20-30 liters vessels should be with wheeled accessory cart.
6. **Dipper:**Liquid nitrogen vessels should come with 10-15 ml dipper.
7. **Warranty:**Two years from the date of installation.

All vendors are requested to attach original technical literature/catalogue in support of the mentioned specifications and highlight the above features.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 34: Vortex

Specifications:

A vortex is required for mixing of suspending pellets used in enzymes analysis, heavy metal analysis, DNA, PCR setup, viscous fluids mixing, etc. the instrument should have following specifications:

1. Mixing frequency: 300 – 3,000 rpm
2. Mixing and vortexing radius: -1.5mm
3. Touch vortex frequency 3500 rpm or more
4. Timer: 15 sec – 99 h, continuous or better
5. Interfaces: USB interface
6. System should stable on work bench even at the maximum speed with minimum noise levels.
7. Instrument must have CE or equivalent Certification.
8. Set of compatible blocks must be provided with the main unit.
9. Vendor should ensure at least 2-3years warranty w.e.f. date of installation.

All the required technical document in support of specification compilation sheet should supplied.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 35: Water Quality Monitoring System

Specifications:

Control Unit and data recording unit	Water proof construction and data logger for continuous recording of data for at least one month with suitable time intervals (for sources like river, lake, shallow water bodies, deep dams, open sea etc.)
Multi-Probe	Measurement temperature: (0 to 50°C)
	Storage temperature: -5 to 50°C or more
	Measurement depth: 10 cm to 80 m
	Probe size: lesser than 10 mm
	Probe length: at least 40 cm
pH	Range: pH 0 - 14
	Resolution: At least 0.01 pH
	Repeatability: ± 0.05 pH
	Accuracy: At least ± 0.1 pH
Dissolved oxygen	Range- 0 to 20 mg/L
	Resolution- Minimum 0.01 mg/L
	Repeatability- $< \pm 0.1$ mg/L
	Accuracy- $< \pm 0.15$ mg/L
Conductivity	Range- 0 to 9.99 S/m
	Resolution- $< 0.1\%$ F.S
	Repeatability- At least $\pm 2\%$
	Accuracy- At least $\pm 4\%$
Salinity	Range: 0-4%
	Resolution- At least 0.01%
	Repeatability- At least $\pm 0.15\%$
	Accuracy- At least $\pm 0.5\%$
Total Dissolved Solids (TDS)	Range: 0-100 g/L
Total Dissolved Solids (TDS)	Resolution- At least 0.1%F.S
	Repeatability- At least ± 3 g/L
	Accuracy- At least ± 5 g/L
Seawater specific gravity	Range- At least 0~50
	Resolution- At least 0.1
	Repeatability- At least 2
	Accuracy- At least ± 5
Temperature	Range- At least 0~55°C
	Resolution- At least 0.01°C
	Repeatability- At least ± 0.3 °C

	Accuracy- At least $\pm 1.0^{\circ}\text{C}$
Turbidity	Range- At least 0~800 NTU
	Resolution- At least 0.1 NTU
	Repeatability- At least $\pm 3\%$
	Accuracy- At least $\pm 5\%$
Water depth	Range(NTU or mg/L)- At least 0~100m
	Resolution- At least 0.1 m
	Repeatability- At least $\pm 3\%$
	Accuracy- At least $\pm 5\%$
Oxidation reduction potential(ORP)	Range- At least ± 1999 mV
	Resolution- At last 1 mV
	Repeatability- At least ± 5 mV
	Accuracy- at least ± 15 mV
Ion	Resolution- at least 0.1%F.S
	Repeatability- At least $\pm 5\%$
	Accuracy- At least $\pm 10\%$
Nitrate ion	NO_3^- : At least 0.62 mg/L and more
Chloride ion	Cl^- : At least 0.4 mg/L and more
Calcium ion	Ca^{2+} : At least 0.4 mg/L and more
Fluoride ion	F^- : At least 0.02 mg/L and more
Potassium ion	K^+ : At least 0.04- mg/L and more
Ammonia	At least NH_3 : 0.1 mg/L and more
Simultaneously measurable parameters	Provision for simultaneous measurement of water parameters
Water monitoring system with superior measurement principles and capable to measure more water quality parameters is preferable	

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 36: Digital Cone Penetrometer

Specifications:

1. The digital cone penetrometer must be suitable for continuous in situ measurement of the resistance to penetration of the soil at a selected site and depth.
2. The device should be a combination of an electronic penetrometer and a data logger for storage and processing of measurements.
3. The instrument should be capable of continuous measurements of soil compaction at least up to 80 cm soil depth.
4. Reading can be viewed directly on LCD Screen in Numeric or in Graphical format.
5. It should display readings on the LCD instantly in standard unit e.g. MPascals or Newton etc.
6. It should record depth as well as resistance at that particular depth and should be able to display the graph on the LCD and the same can be downloaded on a PC for further analysis.
7. Consists of penetration cones of 60° angle of sizes 1 cm², 2 cm², 3-3.3 cm² & 5 cm², probing rod, load cell/force sensor, depth reference plate and data logger for measuring penetration resistance of soil.
8. Force: at least 10000 @ 1 cm² kPa
9. Measurement Range 0 to 10 MPa
10. Measuring accuracy: < ± 1%
11. Resolution 0.1kPa
12. Data output: .txt or CSV format
13. Probing rods of appropriate diameter for different cones
14. Guides/Checks for detection of cone wear
15. Depth of measurement at least up to 80 cm, with Depth resolution of 1cm.
16. Data logger with provision of adjustable display (for bright day light viewing) and control buttons for in field programming, logging and viewing data
17. Capacity to store more than 1200 readings.
18. Interface Cable and Software for downloading data to PC
19. Must have in built GPS for recording location of measurement points. GPS accuracy: < 2.5 CEP(Circular Error Probable).
20. Operational temperature 0 – 50 °C
21. Operational humidity IP 54 (water-resistant)
22. Built in clock and date for automatic recording with the readings.
23. It should have powerful rechargeable battery for in-field operations and to be supplied complete with a sturdy carrying case and necessary tools.
24. The equipment should also have a provision of attaching an external soil moisture sensor and its reading can also be simultaneously recorded with the measurements.
25. The soil moisture sensor should have a measuring range of at least 5-55% volume percentage soil moisture, accuracy < +/- 5%, with 4 measuring pins, length 50 to 60 mm. Cable length 3mt. to 5mt.
26. Quote for Soil Moisture Probe / sensor separately.
27. Quote for spare cones separately as accessories,
28. All standard accessories to be included.
29. A standard factory calibration certificate should be provided.
30. The firm shall submit necessary catalogues, list of customers and product data sheets along with the offer.

Warranty: minimum 3 years

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 37: Advanced Microwave Digestion System

Specifications:

1. A Microwave Digestion system, completely microprocessor controlled to use in laboratory for digestion (Animal tissue sample, Soil, organic, inorganic, plant, sediment and rock samples), dissolution, extraction and drying of environmental samples.
2. The system comprising of a microwave power system, patented microwave cavity design, the cavity design should optimize microwave energy for fast digestion.
3. Magnetron and Microwave output power: Microwave heating system must have a measured minimum focused power output of 300 watts or more, system should be monomode & must have Autosampler up to 96 positions, sequentially. Automation module to be offered as Optional, Should be able to digest various organic & inorganic samples.
4. Cavity design: Cavity design should be rugged, durable.
5. Magnetic stirring and cooling: System should have in built magnetic stirring facility as well as standard cooling facility to be provided (Air compressor). The system must be able to cool vessel from 230 Deg C to room temperature within 3 minutes. There should have facility to purge Forced air.
6. Vendor must include a certified test report of NRTL Safety Listing (commonly Known as UL® approval) for the exact system as delivered (not a similar model) Per OSHA regulations 29 CFR 1910.3 and 1910.7. System having patents will be preferred please mention Patent No if so.
7. System should have technology to effectively manage pressure built up in the vessel and it should safely vent it without loss of analyte.
8. System must operate stand alone as well as through PC, suitable software for such control should be offered as option.
9. Display: System must have a built in operating system with fluorescent Display and alphanumeric keypad for entry of operating parameters.
10. System should have facility to clean cavity in case of spillage. Suitable accessories should be offered in main as well as in option as extra.
11. The system should be compatible with external PC and printer.
12. External Keyboard: To be able to connect with external keyboard.
13. Vessels: Vessels should have vent & reseal technology, without use of any metallic disc.

14. The system should have a high strength 24 or more numbers vessels
15. Vessel Design: Vessels of 80 ml volume capacity made of Pyrex or quartz. Vessels should have PFA liner.
16. Pressure maximum: 35 bar (515 PSI) or more.
17. Temperature capacity maximum: 300°C or more.
18. Temperature control: System should have infrared temperature control option
19. The System software must automatically adjust the power delivery based upon sample Load and pre-programmed control settings.
20. Safety compliance: The system should be certified by necessary safety authority for safe operations. The system should fully compliance with EPA procedures (3015, 3051, 3052).
21. Noise Level: Noise free
22. Power Supply: 220v to 240v stabilized power supply
23. The system should carry a minimum 3 years warranty against corrosion of cavity coating and 2 years warranty against magnetron.
24. Required stabilizer to be quoted.
25. ISO 9001 certified and authorization certificate from the manufacturer.
26. Compliance statement to be furnished with regard to the specifications and superiority of the model quoted having better specifications than the one asked for.
27. All other items essential attachments for the smooth running of the equipment except electrical points and table to be included in the main offer, if not covered earlier.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 38: Glass Door Refrigerating Cabinet

Specifications:

1. Temperature range: +01 to +11 °C
2. Capacity: 1300-1500 Liters
3. Door: Double glass door with good insulation with door locks
4. Shelves: At least six
5. Integrated controller with digital display and high and low temperature alarms
6. Refrigerant: Environmentally safe refrigerant mixtures CFC-FREE, HCFC-FREE non-flammable refrigerants
7. Certifications/compliance: CE marked.
8. Automatic defrost.
9. Forced air circulation.
10. Fluorescent lighting for interior illumination
11. Electric supply: 220-230V/50 Hz
12. Suitable high quality voltage stabilizer should be provided.
13. Warranty two years from the date of installation.

All vendors are requested to attach original technical literature/catalogue in support of the mentioned specifications and highlight the above features.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 39: Laminar Air Flow

Specifications:

Laminar flow (Horizontal) which should be able to clean the air for microbiological, biotechnological, and biochemical research. The cabinet should ensure sterile conditions for the protection of processed material from external impurities and contaminations.

- It should have 99.99% efficient HEPA filter.
- It should have pre-filters for better performance.
- It should fulfill class 5 conditions per ISO 14644-1 and 2 norms.
- It should have differential pressure gauge.
- It should have double gasket, negative pressure HEPA filter leak protection.
- It should have front mounted light and blower switches.
- It should have options for variable speed motor/blower(s) with vibration isolation pad.
- It should have fluorescent lighting.
- It should have factory installed 254 nm UV light with screen for secondary decontamination while the bench is not in use.
- It should have UV light switch for safety it must be interlocked with the UV screen to help prevent inadvertent UV exposure while the bench is in operation.
- It should have variable digital timer.
- It should have top quality brushed stainless steel work surface.
- It should have thick tempered safety glass side panels with utility ports.
- It should have for disassembling for passage through a narrow door or hallway
- It should have Indian type power cord with plug.
- Should be supplied with quality electric loop sterilizer Temperature up to 250^o C and it should also have inbuilt vacuum and gas burner connection point with knobs
*Ceramic Funnel * Stainless steel perforated guard with wheels.
- Vendor should ensure at least three year onsite warranty.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 40: Soil Thermometers

Specifications:

The soil thermometers should be as per IS 6592-1972

1. It should be suitable to measure soil temperature at 5 cm soil depth.
2. Accuracy: $\pm 1^{\circ}$ C or better
3. All the thermometers should be tested and calibrated at recognized government department/institutions, and a standard factory calibration certificate should be provided.
4. The firm shall submit necessary catalogues and product data sheets along with the offer.
5. Suitable carrying case.
6. Suitable stand (As per IS6592-1972 specifications) for soil holding the thermometers – 5cm depth in the field.
7. Warranty: minimum 2 years

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 41: Rotary Evaporator

Specifications:

A high end rotary evaporator is needed for solvent evaporation at controlled temperatures during extraction of biomolecules with the following specification.

- It should have chemical resistant vacuum seal longevity of operation and to reduce spare parts requirement.
- The flange should be made of chemical resistant PPS to reduce corrosion, maintenance and spare parts cost to a minimum
- It should have non- sticking vapor tube with clamping sleeve to eliminate broken glass and reduces spare parts cost significantly.
- The clip should be easy removal option for sticking flasks and it should not be lost due to the direct connection to the drive.
- The safety bath should be power off if temperature overshoots by 5⁰ C or runs dry
- It should have more than 200⁰ C heating bath with safety handles and pour spout able to accommodate at least 1-5 liter flasks.
- It should have a metal support between the heating bath and the base unit to prevent bath instability.
- It should have a separate on/off switch for heating to prevent unintentional heat up the button and illuminated for visual control.
- It should able to continuous unattended evaporation without limits.
- It should have the automatic module and distimatic bench top with automatic drainage for residue should be an affordable and more flexible alternative to large scale rotary evaporator.
- The detachable panel should allow for the highest operational safety from outside closed fume hoods.
- It should supply with suitable chiller and different size of flask holders and three year warranty.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 42: Magnetic Stirrer

Specifications:

A magnetic stirrer with hot plate is needed to carry out mixing and simultaneous heating of various laboratory chemicals and reagents.

- It should have digital display for setting and monitoring of the readings.
- It should have chemical resistant, scratch proof plate.
- It should be able to generate magnetic field high enough to easily stir the solutions with high viscosity.
- It should be able to carry our stirring even in case of heating failure, so as to avoid excessive heating of the reagents.
- It should have safety indications to avoid accidental burns.
- It should have rotations speed pre-optimized to protect the user from sudden spraying of droplets of solutions while reaching the maximum speed.
- It should supplied with Indian type power cord.
- Vendor should supply all the necessary technical documents.
- It should be supplied with all required accessories.
- Vendor should ensure at least three year onsite warranty.
- The tools and kits should be supplied with the main unit.

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Item No 43: Diesel Engine with Generator set

Specifications:

1 Diesel Engine (Suitable capacity to drive 250KVA alternator)

The diesel engine should be vertical cylinder type having 6 cylinders totally enclosed, compression ignition, water cooled (radiator cooled), turbo charged cooled suitable for Power generation application having minimum of 306 BHP capacity to drive the 250 kVA alternator at 1500 rpm under NTP condition confirming to BS 649, complete with all interconnecting piping and the following standard accessories.

- a) Suitable fly wheel.
- b) Flexible coupling
- c) Air cleaner
- d) Radiator – heavy duty type
- e) Cooling fan
- f) Water circulating pump
- g) Corrosion resistor
- h) PT fuel pump
- i) Electronic governing control (EGC)
- j) Fuel filter
- k) Fuel shut down solenoid (24Vdc, stop solenoid)
- l) Lubricating oil filter
- m) Oil cooler
- n) By pass filter
- o) Silencer (Residential type)
- p) Starter
- q) Engine instrument panel with following Lubricating oil temperature Lubricating oil pressure gauge Water temperature gauge Hour meter and speedometer
- r) The engine should have following
 - Safety control trip for low lube oil pressure
 - Safety control trip for high lube oil temp.
 - Safety control trip for high water temp.
 - Safety control trip for engine over speed

2 Requirement for the diesel engine

The diesel engine shall be vertical cylinder, single acting, mechanical injection type and furnished with all the required equipments as per standard practice. The engine should develop rated horse power to drive 250kVA alternator.

The required auxiliaries, guarantee of fuel consumption for rated output, provision for parallel operation, governor performance and torsional vibration shall be in accordance with BS: 649.

The engine shall be provided with an exhaust gas turbo charger and a charged air cooler, integral air intake filter and silencer.

The engine should have throttle control, the engine water cooling should have radiator. For charged air cooler, the cooling water inlet flow shall be thermostatically controlled.

3 Fuel system

Fuel (Diesel) system to the engine shall be supplied from a fuel tank. The supplier should provide a fuel tank of 900 liter capacity, including 200 liter reserve capacity to be installed in a weather proof enclosure. The supplier should provide mechanical fuel level indicator with 'Low' and 'High' markings.

The fuel tank shall be free standing, floor mounting type with mounting brackets, fuel inlet and outlet, air vent, drain plug, opening with cover for direct filling from the top of the tank. Provide suitable fuel pipe lines for suction and return with bends, collars etc.

An engine driven booster pump shall be provided to deliver fuel from the supply line to the fuel injector through two numbers of fuel filters.

4 Lube oil system

The automatic pressure lubrication shall be provided by an engine driven pump. This system should be complete with an oil cooler and 2Nos. of 100% capacity mesh filters. The oil cooler should be water cooled and equipped with necessary bypass arrangement, to bypass cooler during starting until oil temperature reaches the minimum (or the threshold) temperature.

5 Engine starting system

Starting of the diesel engine shall be of electric starting. The electric starting system should have starter motor, Lead acid starter Batteries, battery charger and necessary instrument and accessories to indicate the condition of the batteries.

6 Batteries

The batteries shall be sized taking in to account the starting load requirement of the D-G set. 2Nos. of 12V, Lead acid batteries, of suitable capacity to start the engine by 24V DC electrical starting Motor without struggling, and with suitable capacity of battery cable. The batteries must be capable to try 3 unsuccessful starts continuously. The batteries have to be placed on a suitable well painted steel stand.

7 Air intake system: Air intake system should have requisite air filters and complete interconnecting piping, supports etc.

8 Exhaust system

Engine exhaust system shall consist of exhaust gas driven turbo charger with lagged piping, interconnecting cylinder head out lets with the turbo charger inlet. Exhaust gas from the turbo charger shall be let out through exhaust gas silencer. The exhaust gas silencer, necessary pipes etc., shall be provided by the contractor. Exhaust piping shall be suitably cladded with aluminum sheets, mineral wool etc. The silencer should be of residential type.

Flexible connection (expansion joints) shall be provided in the exhaust piping to avoid transmission of vibration from engine to the structure (acoustic and weather proof enclosure

etc.). Also the exhaust line with suitable bends, collars, flanges, angle supports and other accessories should be provided. Provide necessary arrangements to avoid entry of rain water, falling dust etc. at the top of the exhaust pipe. The exhaust piping system should be designed and laid upto a height of 5 Meters above the acoustic enclosure or as directed by the SPMU authorities to suit the site and environmental condition as per the controller pollution board, standards.

9 Engine governing system

The engine governing system shall be of class 'A' hydraulic governor. An over speed trip mechanism shall be provided to automatically shut off the fuel supply in case of set speed reading about 110% of rated speed.

10 The Alternator

The Alternator shall be screen protected, drip proof, separately excited system (with PMG) of brush less, continuously rated to give an output of 200kW/250kVA at 0.8 pf at 415V, 50Hz, 1500rpm, 3 phase, 4wire. The alternator should be provided with automatic voltage regulator with voltage regulation of $\pm 0.5\%$ (MX321) and is designed, tested for confirming to IS 4772/1992 or IEC 34.

11 Requirement of Alternator

- a) KVARating: 250
- b) kW Rating : 200
- c) Terminal Voltage: 415 V
- d) Power Factor: 0.8 (lag)
- e) No. of Phases: 3
- f) No.ofwires : 4
- g) Type of excitation: with built in Self excitation.
- h) Voltage Regulation: +/- 0.5 %.
- i) Frequency: 50 Hz.

The insulating material of Class H and shall be non-hygroscopic and fully tropicalised. The Alternator shall be suitable for operation with its neutral solidly grounded. The neutral shall be formed at the terminal box.

The alternator terminal box is made out of 16 SWG sheet steel having louvers and removable type bottom gland plate, top inspection cover and 600A capacity tinned Copper Bus-bars for all phases and Neutral. The Bus-bar should be properly supported with porcelain / resin cast epoxy molded bus supports. Provide sufficient clearances between phases and earth as per BS / IS standards.

12 Mounting

Design fabricate suitable base frame, which is a welded construction using channel iron etc. to mount D-G set

13 Foundation

- A. Base/foundation should be designed considering safe bearing capacity of soil.
- B. The length and breadth of base/foundation should be at least 150-300 mm (6-12") more than acoustic enclosure length and breadth respectively.
- C. Ensure that the concrete is completely set and hardened before positioning the enclosure.
- D. It is recommended to have base/foundation height about 100-150 mm above ground level, it helps to maintain cleanliness.
- E. Check the base/foundation level diagonally as well as across the length for even flatness and same should be within ± 0.5 degrees of any horizontal plane.
- F. The installation design must provide a proper base /foundation to support the acoustic weight and to prevent damaging or annoying levels of vibration energy from migrating into the building structure. In addition, the installation should assure that the supporting infrastructure for the generator set does not allow vibration from the enclosure to migrate into the stationary portion of the equipment.
- G. Whenever seismic events are a consideration, a qualified structural engineer should be consulted.

14 Earthing

The Generator Neutral should be earthed with 4 Nos. of Copper plate earthing as per BS 6043

15 Tests

Supplier shall perform all standard tests (Shop tests) on Engine and alternator and the test reports pertaining to the engine and alternator should be submitted.

16 Commissioning

Supplier shall perform the following tests at site to the satisfaction of SPMU

- a) Testing the set in Auto / Manual / Test modes.
- b) Testing for all Interlocks
- c) Full load test on the set for Eight hours

17 Acoustic and Weather proof Enclosure

Design, fabricate, supply and install out door type acoustic and weather proof enclosure for the healthy operation of 250 kVA D-G set at site. The enclosure should be well fabricated structure using 14 SWG sheet steel on all sides. Provide sufficient working clearance around the D-G set inside the enclosure.

- a) Special acoustic panels of optimum sound attenuation using special Aluminum sheets (perforated) and acoustic grade high density wool sandwiched with gypsum.
- b) Self insulated ventilation louvers for proper air aspiration and temperature control with suitable incorporation of special blower / axial fans of heavy duty depending on the on-site fresh air needs.
- c) Corrugated steel frames and sturdy supporting material for housing the panels, effective sealing with the right gasket/ neoprene materials.

d) Well fabricated / nylon wheeled smooth sliding doors to be provided for easy access to the set. Suitable locking arrangement has to be provided on the doors.

e) Aesthetic finish (with intensive painting care) for perfect integration with the surroundings.

f) Noise level should be less than $65 \pm 3\text{dB}$ at 3 meter distance from the enclosure.

g) Acoustic and weather proof enclosure system should be complete in all respect as per prevailing standards.

h) Adequate and suitable lighting arrangement inside the acoustic enclosure shall be made.

Note; Separate DP MCBS with control box to be provided for Lighting and blower fans.

18 LT distribution switchgear panel

Design, fabrication & supply of Indoor L.T. 415V distribution switchgear Panel made out of 16 SWG CRCA sheet steel Enclosure with powder coated matt grey finish. The panel shall have proper supporting and mounting structure of suitable size 'u' channel, provision for grouting. Provide sufficient clearance between live and non-live parts as per standards. The panel should have 14 SWG gland plate. Cable alley and bus-bar chambers should be provided.

19 Requirements in AMF panel

INCOMER : - 1No. of 630A, 415V SDF with 400A fuse FEEDERS : - a) 2 Nos. of 200A, 415V TP&N SDF. With fuse b) 1No.of 100A, 415V TP&N SDF With fuse

Features Desired:

- Battery Charger
- Automatic engine starting and stopping
- Automatic load transfer
- Automatic shut down on faults namely
 - Over speed
 - Under speed
 - High temperature
 - Low oil pressure
 - Activating spare fault inputs.
- Diagnose mode for trouble finding.
- 5 relay output with indications namely
 - Inbuilt hooter
 - Crank
 - Solenoid
 - Mains contactor
 - Dg or alternator contactor
- Led indications for alarms namely
 - Set run
 - Mains ok

- Start faultier
- Hct
- Lop
- Two tripping spare inputs
- External remote start
- External remote stop
- Auto/manual mode select by remote (WIRE)
- Single three phase mains sensing (Selectable)
- All timers inbuilt
- Auto test mode(periodic start stop)
- Lop disconnect warning
- Operation without Lop interlock possible
- Mandatory Crank Logic for cold climate
- Protection for DG Sets even when AMF Panel DC Power is OFF

AMF Panel Front LED indication Details

- MAIN RED LED: When On mains power OK, it indicates Mains is incoming & Amf sensed
- Gensets GREEN LED: When Green LED glows it means DG Gensets is running
- Fault Red LED: When On it goes on whenever some fault is generated or fails to starts if Gensets is not running. Such as LLOP / HCT / NO FULE / LOW BATTER
- Auto Indicate the system of Auto Mode
- Manual Indicate the system of Manual Mode

OPERATING MODES

1. AUTO Mode
2. MANUAL Mode

20 Metering & Indication

- 0-500V digital voltmeter of size 96 mm square with selector switch.
- CT operated 400/5A digital Ammeter 3 ½ digit of size 96 mm square with selector
- Switch.
- 1 Set of Measuring CT 400/5A, class-1 for all the Three Phases.
- 3 Nos. of 22.5 mm dia 230V Cluster LED type Phase indicating lamps for R,Y, B.
- Separate control Fuses 2/4A, for Voltmeter, indication circuits.
- Use 2.5 sq. mm. Copper multi strand wire for measuring and control circuit.

21. Minimum of two years warranty from the date of installation

22. Minimum of 4 free Services

(All the above mentioned specifications are needed to be highlighted by the quoting firm in its literature with the serial no. of the specifications as mentioned above)

Annexure- II

**PRICE SCHEDULE FOR DOMESTIC GOODS OR
GOODS OF FOREIGN ORIGIN LOCATED WITHIN INDIA**

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>
Item Description Country of origin	<u>Accountin</u> <u>g unit &</u> <u>quantity</u>	Exfactory / exware- House/ex - showroo m off the shelf	<u>Exc</u> <u>B</u> <u>e</u> <u>duty</u> <u>if</u> <u>any</u>	<u>Packing</u> <u>and</u> <u>forwardin</u> <u>g</u>	<u>Inland</u> <u>transportatio</u> <u>n</u>	<u>Insuranc</u> <u>e other</u> <u>duties</u> <u>and</u> <u>taxes, if</u> <u>any(oth</u> <u>er than</u> <u>sales tax</u> <u>and</u> <u>incident</u> <u>al costs)</u> <u>(e)</u>	<u>Incidental</u> <u>services</u> <u>(including</u> <u>supervisio</u> <u>n)</u>	<u>Overall</u> <u>unit price</u> <u>a+b+c+d+</u> <u>e+f</u>	<u>Total</u> <u>price</u> <u>2X9</u>	<u>Sales tax</u> <u>payble if</u> <u>contract is</u> <u>awarded</u>

Total bid price in Rupees :
(in figures)

(in words).....

Place :

Signature of bidder.....

Date:

Name.....

Business address.....

Note :

I. In case of discrepancy between unit price and total price, the unit price shall prevail.

PRICE SCHEDULE FOR GOODS TO BE IMPORTED FROM ABROAD

1	2	3 a	4 b	5 C	6 d	7	8	9	10
Item Descripti on Country of origin	Accoun ting unit & quandy	Unit price FOB port of lading or loading which is correct	Unit price CIF at port of entry	Inland transportati on charges, insurance and other local cost incidental to delivery, if specified	Incident al services including supervisio n	Overall unit price [b+c+d or a+c+d]	Total price 2X7	Indian agent name	Indian agent commiss ion as a% of FOB price included in the quoted price