

**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 form **(Two Bid System)** for **“Supply, Installation, Demonstration and Commissioning of Laboratory Equipment”** from the reputed manufacturers and suppliers. The details are as furnished below:

Sr. No.	Name of the Equipment	Qty.	EMD
1	Glass Door Refrigerating Cabinet	1	Rs. 10,000/-
2	Lab Washer Disinfectors	1	Rs.36000/-
3	Refrigerated Incubator Shaker	1	Rs.25,000/-
4	Centrifuge	1	Rs.10,000/-
5	Liquid Nitrogen Storage Vessels	6	Rs.10,000/-
6	Plant Growth Chamber	3	Rs.2,55,000/-
7	Microscope: Confocal Laser Scanning	1	Rs.2,40,000/-
8	Hot Air Oven	2	Rs.20,000/-
9	Chemical Fume Hood	3	Rs.39,000/-
10	Digital Cone Penetrometer	1	Rs.14,000/-
11	SPAD Chlorophyll Meter	1	Rs.5000/-
12	Automatic Blood Analyzer	1	Rs.10,000/-
13	Rotary Microtome	1	Rs.20,000/-
14	Microscope (Light)	2	Rs.20,000/-
15	Laminar Air Flow	1	Rs.6000/-
16	Biosafety Cabinet	1	Rs.9000/-
17	Deep Freezer	1	Rs.8000/-
18	Western Blot	1	Rs.6000/-
19	Deep Freezer (-20°C)	1	Rs.7000/-
20	Real Time PCR	1	Rs.40,000/-
21	Analytical Balance	1	Rs.5600/-
22	Microscope Fluorescent	1	Rs.20,000/-
23	Centrifugation	1	Rs.9000/-
24	Water Bath	1	Rs.6000/-
25	Gel Electrophoresis Horizontal	1	Rs.12,000/-
26	UV-Vis Spectrophotometer	1	Rs.10,000/-
27	Software	1	Rs.7000/-
28	Water Quality Monitoring System	1	Rs.6000/-
29	Deep Freezer	1	Rs.8000/-
30	Texture Analyzer	1	Rs.60,000/-
31	Sprayer Tractor Operated (Mounted)	1	Rs.8000/-
32	Power Tiller with Accessories	1	Rs.6500/-
33	Mini Tractor with Accessories & Attachments	2	Rs.26,000/-
34	Deep Freezer	1	Rs.8000/-
35	CO2 Incubator	1	Rs.10,000/-
36	Deep Freezer (-80)	1	Rs.12,000/-

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 **16.06.2016** 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 **07.07.2016** up to **12.00 noon**
4. The last date of receipt of complete sealed tenders is **07.07.2016** up to **01.00 PM**
5. The process of opening of the technical bid will be on **07.07.2016** at **2.30 PM**

-Sd-  
ADMINISTRATIVE OFFICER  
NIASM, BARAMATI

TENDER DOCUMENT No. 4-6/2016-17

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

**INVITATION OF TENDER FOR "SUPPLY, INSTALLATION, DEMONSTRATION AND  
COMMISSIONING OF LABORATORY EQUIPMENT"**

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

SALE OF TENDER DOCUMENT FROM **16.06.2016** FROM 10.30 HRS TO 16.30 HRS ON ALL  
WORKING DAYS AT THIS INSTITUTE

LAST DATE OF SALE OF TENDER FORM: **07.07.2016** UP TO 12.00 Noon

LAST DATE AND TIME FOR ACCEPTANCE OF SEALED TENDER DOCUMENT IS ON  
**07.07.2016** UP TO 01.00 PM

DATE OF OPENING OF TECHNICAL BID WILL BE ON **07.07.2016** 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.4-6/2016-17

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

**INVITATION OF TENDER FOR "SUPPLY, INSTALLATION, DEMONSTRATION AND  
COMMISSIONING OF LABORATORY EQUIPMENT"**

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.**

**In order to facilitate for speedy settlement of Payment, the firm is requested to furnish the following details:**

- 1. Name of the firm**
- 2. Name of the Bank**
- 3. IFSC Code of Bank**
- 4. Name of the Account & Account Number**
- 5. Branch Code**
- 6. Amount to be paid**
- 7. E-mail address of the party**

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

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To

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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”**. 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.4-6/2016-17  
**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 07.07.2016 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 07.07.2016 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: Glass door refrigerating cabinet**

Specifications:

1. Temperature range:  $+01^{\circ}\text{C}\pm 1^{\circ}\text{C}$  to  $13^{\circ}\text{C}\pm 2^{\circ}\text{C}$
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 or LED lighting for interior illumination
11. Electric supply: 220-230V/50 Hz
12. A 5 kVA high quality voltage stabilizer should be provided.
13. 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 2: Lab washer disinfectors**

Specifications:

### **A. Laboratory glassware washer-drying system**

**Lab washer disinfectant should have built in washing, disinfecting and drying system with following features:**

1. Front-loading unit with bottom-hinged door
2. Electronic door lock/automatic door lock
3. Internal dimensions/Washing chamber dimension (WxDxH): 500-600 mm X 500-650 mm X 500-950 mm).
4. Microprocessor based programme: upto 10-20 programmes.
5. Forced hot air drying system with HEPA/ULPA air filter 99% or better
6. Integrated dispenser/dosage pumps for chemical/detergent and neutralizer. At least two dosing pumps equipped with level sensor.
7. System should have built in detergent cabinet. Storage capacity up to 3-4 containers each of 5 liters.
8. System should have steam condenser.
9. There should be provision of built in boiler/heater for hot water.
10. Water supply connection for hot, cold and de-mineralized water.
11. Monitoring required for conductivity. Conductivity sensor
12. Water pre-heating system should be in the machine.
13. Certification/conformity: CEE or VDE, VDE-EMC, CE 0366, IP 20 certification.
14. System should be equipped with washing and air drying system on 2-4 levels. Chamber volume 250 Liters or larger.
15. Water softener should be provided.
16. Demineralization unit should be provided. Additional 2 cartridges and Booster pump for demineralized water should also be provided.
17. Cleaning chemicals (detergent and neutralizer) should be provided.

### **B. Essential accessories for Laboratory glassware washer-drying system**

1. Upper basket/washing cart with 60-100 jets/spigots
2. Upper basket/washing cart with 35-50 jets/spigots
3. Upper basket/washing cart with washing arm
4. Lower basket/washing cart with 60-100 jets/spigots
5. Lower basket/washing cart with 35-50 jets/spigots
6. Lower washing cart
7. Lower pipettes washing cart 50-100 positions.
8. Inserts for Petri dishes at least 50-60 positions.
9. Spare injection nozzles/spigots at least 10 each used for washing flasks, beakers, bottles, measuring cylinders, big bottles.

### **10. Test tube support/ net basket:**

Capacity: 75-120 standard test tubes. Equipped with removable compartments with id.  
Made of stainless steel.

**C. Water purification system**

Water purification system should be able to produce Type II and Type I grade water. RNase and DNase free water should be produced. Two sets of additional cartridges/ultra-filtration unit should also be provided in spare. Tank capacity: 25-30 liter. 2 Additional carbon filters should be provided.

**D. Electrical power supply: 3/N/PE 400V ~ 50Hz 7.0 kW**

**E. Trolley for loading and unloading carriages.**

**E. Warranty: Two 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 3: Refrigerated Incubator Shaker**

#### Specifications:

1. Shaking speed: 20 ( $\pm 5$ ) –450 ( $\pm 50$ ) rpm.
2. Shaking load capacity: At least upto 15-30 kg. Universal platform with dimensions of 725-800mm X 420-460mm. Platform should be easily removable for cleaning. Pull out/slide out platform/tray.
3. Temperature range: 15°C ( $\pm 5^\circ\text{C}$ ) below ambient to 60-80°C ( $\pm 20^\circ\text{C}$ ). Cooling option.
4. Internal illumination/lighting: Halogen/fluorescent/LED lighting.
5. Stainless steel interior with single door.
6. Large, clear view port or window on door.
7. Microprocessor based programmable controller for multiple set point changes to temperature, speed.
8. Audible and visible alarm.
9. With a universal platform, flask clamps, spring wire rack and test tube racks. Holders/clamps: 12 X 125/150 ml flask, 24 X 250 ml flask, 12 X 500 ml flasks, 6 X 1000 ml flasks, 6 X 2000 ml flask and three test tube racks each for 10-15ml or 11-15 mm, 15-18/20 ml, and 18-25 mm or 20-25 ml tubes.
10. Should have UV light or HEPA filter.
11. CE certification.
12. Power supply: 220-240 VAC, 50/60 Hz
13. Voltage stabilizer supplied: 5 KVA
14. Original company literature from Principal company / Manufacturer must be supplied, clearly verifying all specifications.
15. Warranty: 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 4: Centrifuge**

##### Specifications:

1. Centrifuge should be refrigerated.
2. Temperature range: -10°/-20° to +40°C
3. Centrifuge with fixed angle rotors for 24/30 X 1.5/2 ml tubes with 15,000-18,000 rpm
4. Rotors 6 X 50 ml and adaptors for 15 ml with 7,500-9,500 rpm speed.
5. Swing bucket rotors for 4X100-150ml conical tubes/flat bottom with 4,000-6,000 rpm speed.
6. Swing bucket rotors for microplate with 4,000-6,000 rpm speed.
7. Rotor lids should have a Lock-system for secure lid closing and opening.
8. Noise level should not be more than 62 dBA.
9. The centrifuge must be CE/ CSA/ UL certified.
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.
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.)**

### **Item No 5: Liquid Nitrogen Storage Vessels**

Specifications:

- 1. Liquid Nitrogen Capacity:** Liquid nitrogen vessels should be of 1 liter, 2 liters (two quantities each) and 20-30 liters (two quantities) LN2 storage capacity.
- 2. Neck diameter:** 5-6 cm  $\pm$  2 cm for 20-30 liters LN2 vessel; 10-15 cm  $\pm$  2 cm for 1 and 2 liters containers.
- 3. Static evaporation rate:** 0.15-0.50 L/Day for 20-30 liters vessels.
- 4. Wheeled Accessory Cart:** 20-30 liters vessels should be with wheeled accessory cart.
- 5. 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.)**

## **Item No 6: Plant Growth Chamber**

Specifications:

### **1. CONTROL SYSTEM:**

- Advanced control system. All of the input, output and Ethernet communication components should be integrated on the 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.
- 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.
- 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.
- 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. CONSTRUCTION DETAILS REQUIRED:**

- Exterior dimensions: (W) 100-130" x (D) 60-80" x (H) 100-125".
- Interior dimensions: (W) 75-105"x(D) 60-65" x (H) 75-100".
- Growth height: 75-80" between perforated aluminum channel floor and the lamp bank barrier.
- Insulation: The insulation should be "foamed-in-place" polyurethane.
- Doors: The room should have one or two front doors.

### **4. OBSERVATION WINDOW:**

A thermal-pane 10-15" x 10-15" should be provided for interior viewing.

- Cabinet construction: Cabinet should be built in panel sections. Each section consists of 3-5"-thick urethane insulation, metal interior and exterior surfaces, cam-type fasteners and vinyl gaskets.
- Floor: Insulated floor should be 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 should be provided

- 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 lamp sand/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
- 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. Heating: Via hot gas and electric heaters.
- Evaporators: Laminar air flow or copper tube construction and aluminum fins. Dual evaporator's coils: One coil in each side wall of the chamber to maximize chamber performance.

**7. AIR FLOW:**

Air Flow: Uniform vertical downward air flow.

**8. 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:  $\pm 1.0^\circ\text{C}$

**9. 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 be consisting of electrical heaters and dehumidifying evaporators or condensation on the cooling system evaporation.
- Suitable RO system should be provided with chamber.

**11. TEMPERATURE SAFETY LIMIT CONTROLS FOREXPERIMENT PROTECTION:**

Adjustable high and low temperature controls, audible alarms and visual indicators should be provided.

**11. CO<sub>2</sub> package with CO<sub>2</sub> sensor of 2000-3000 ppm with CO<sub>2</sub> cylinder and regulator should be provided.**

**12. Operation manual, service wiring detail should be provided with machine.**

**13. Door locks with keys. Additional external temperature safety controller with independent temperature sensor.**

**14. ELECTRICAL REQUIREMENTS WITH THREE PHASE VOLTAGE STABILIZER:**

- Electrical requirements: 280V/380V/440V/3-phase/50/60 Hz, 4 wire plus ground.
- Condensing unit requirements: 280V/380V/440V/3-phase/50/6 Hz, 3 wires plus ground.

**15. Warranty three years after installation.**

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

## **Item No 7: Microscope: Confocal Laser Scanning**

### **Specifications:**

The Laser Scanning Confocal system should have optical slicing capabilities and suitable for fixed and live cell sample imaging. The system should be capable of spectrally resolve auto fluorescence and generate images of the fixed tissue samples. System should be of high sensitivity detection capability to meet various challenging imaging needs of multi-fluorescence, FRET, FRAP, FLIP, photo activation, spectral imaging and conversion experiments.

### **The system should include the following configuration:**

#### **A. Fully Motorized & Computer Controlled Upright/inverted Fluorescence Research Microscope:**

1. Bright field, fluorescence and DIC observations with Motorized Z-focus drive with step size of 10-15nm.
2. Fluorescence filter cube turret with motorized 8-10 position turret with narrow band pass interference type filter blocks for FITC/GFP dyes, DAPI/Hoechst, TRITC/Rhodamine, CFP, YFP and RFP/Texas Red.
3. Six position motorized DIC nose piece. XY motorized stage with universal sample holder for slides and 35 mm Petri dish.
4. 12V/100w halogen/High power LED illumination for BF & DIC and 120/130W metal Halide Illuminator with long lifetime of 1500-2000 hours for fluorescence. Motorized 7/8 position condenser with motorized polarizer and analyzer. Quote for two additional spare bulbs.
5. Motorized DIC Optics for all the objectives.
6. Wide field eyepieces 10X paired with FN 22 mm or better
7. High Resolution Confocal Grade objectives:  
Plan Apochromat Objectives: 20/25X water / NA 0.7-1 or better and working distance 0.25 mm or better, 40X water immersion/ N.A. 1.1 or better and working distance 0.25 mm or better, 40X oil / N.A 1.30 or better, 60/63X water immersion / N.A. 1.20 or better and working distance 0.2-0.3 mm.
8. All objectives should be corrected from UV, Visible to IR. Band Pass fluorescent filters for DAPI, FITC/GFP& TRITC/Rhodamine.
9. Digital cooled monochrome CCD digital camera with 1.4 million pixel chip resolution, 2/3" CCD chip, FireWire IEEE 1394 connectivity controlled by software for high resolution fluorescence/DIC digital imaging for Z stack, time lapse and multi-channel Fluorescence. 20 FPS or better.
10. The system should be supplied with latest integrated computer system of latest configuration tried & tested for system, directly from the manufacture. Hard drive: 2TB, Large 30" LCD TFT monitor and 32 GB Ram memory.
11. An anti-vibration table for the complete microscope, laser scanning system and work station (computer system) table should also be supplied.

#### **B. Spectral Confocal Laser Scan head with built-in detectors:**

1. The scan head should have independent port for UV and visible light lasers. Galvo scanner should have highest reflectivity (>90%) from 400-1000 nm for detection of faint signal.
2. High sensitivity confocal laser point scanning and detection unit with built-in spectral detectors for high efficient fluorescence signal collection. Capable of conventional intensity & spectral based confocal imaging for complete visible range.
3. System should have minimum two high sensitivity built-in fluorescence GaAsP spectral detectors or array GaAsP detector and spectral 2 PMT detectors.
4. Spectral detectors with a resolution of 2-5 nm throughout the visible spectrum. Confocal detection should include simultaneous spectral detection and separation of 4 Fluorophores. Each detector should have independent intensity, gain and offset control. A spectral GaAsP or array GaAsP detector must be included for high sensitive imaging with quantum efficiency of 45%.
5. All the fluorescence detectors should directly be coupled to the scan head without any optical fibres for efficient signal collection and higher sensitivity.
6. All the spectral detectors should have spectral resolution of 2-3 nm or lower throughout the visible spectrum (400-800 nm) through a reflection grating/Prism. The system should be supplied with an independent transmission light detector for generating confocal DIC images in bright field mode for studying localization of proteins/molecules of interest.
7. The spectral detector should be capable of generating spectral profiles from 400-800 nm range and generate spectrally unmixed images to avoid auto fluorescence.
8. Should be capable of imaging 4 fluorophores simultaneously and at least 6 in sequential mode.
9. Spectral dispersion of the emission light should be of latest technology with highly efficient spectral separation.
10. Motorized & computer controlled continuously variable confocal pinhole with software control. High speed XY Galvo scanner with 180/360 degree scan rotation with total scan flexibilities of Line, free hand curved line, XY, XYZ, XYZT and XYZt,λ combinations.
11. Scan resolution 4K x 4K or better for all channels. Scan Zoom range 1.0X to 40X or more.
12. Scan speed of minimum 4-8 fps @ 512x512 pixel resolution and shall increase 110 FPS or better at 512/16.
13. Data acquisition and digitization capability with 8, 12 and 16 bit should be available. An additional transmitted light detector should be offered for bright field and DIC imaging
14. The system should be offered with the following combination of laser lines (diode lasers, multiline Argon and HeNe Lasers) to excite the respective fluorochromes:  
 Diode lasers: 405 nm. Laser violet 445/448, Laser blue 488, laser green 552/559/555 and laser red 638/640 with complete power supply and AOTF control, or suppliers can offer gas and other laser combination, Diode lasers: 405 nm. multiline Argon lasers: 458 nm, 488 nm, 514-515 nm with 35mW or higher, DPSS 561/559 nm, HeNe 633 nm or laser diode 635 nm, with complete power supply and AOTF control.

15. All the lasers should be connected to the scan head through fibre optic cable. All the laser lines should be computer controlled for fast laser switching and attenuation in synchronization with the scanner.

**C. System control and imaging software.**

1. Software should be capable of controlling motorized functions of microscope, scan head control, laser control, scanner control, and image acquisition & processing. Software for all applications should be provided. Saving of all system parameters with the image for repeatable/reproducible imaging. Capability of line, curved line, frame, Z-stack, time series imaging. Photo-activation/conversion, FRET, FRAP imaging capabilities and physiology applications. Ion imaging with online ratio metric imaging and analysis.
2. Standard geometry measurements like length, areas, angles etc. including intensity measurements. 3D image rendering, reconstruction and navigation. Co-localization and histogram analysis with individual parameters.
3. High Dynamic Range Imaging, real time ratio imaging, channel un-mixing, direct hard drive recording, spectral un-mixing/finger printing to separate the auto fluorescence with fluorescence signal and separation of overlapping dyes such as GFP / YFP. Online spectral un-mixing for separation of overlapping emission spectra of fluorochromes with all the detectors
4. System should have laser intensity stabilization / feedback feature so that there is no intensity variation during long hours imaging experiments.
5. The system should be capable of real-time Ca<sup>++</sup> imaging / ratio imaging of two colours with visible range of dyes using same detectors.

**D. Installation and service support.**

1. Bidders should clearly specify the after sales service and application support capabilities. Should provide all pre-installation requirements to have the system installed in ideal room conditions.
2. Provide a detailed list of users of the quoted system in India with contact details.

**E. 1. Electrical: 220-240 VAC**

2. A suitable online UPS with 60 min backup should be provided.
3. Warranty: Two years warranty including lasers must be offered.

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

**Item No 8: Hot Air Oven**

## Specifications:

1. Temperature range: 50°C -350°C  $\pm$ 20°C.
2. Interior chamber volume: >150 litres
3. Interior material of oven should be of good quality corrosion resistant stainless steel.
4. Convection: Gravity convection.
5. Hot air oven should be microprocessor controlled.
6. Number of shelves: Three to four.
7. Loading capacity of each shelf should be at least 25 kg.
8. The inside temperature must be uniform at all the places in the oven and temperature variation should be not more than  $\pm$  0.5° C.
9. The unit should be supplied with high quality 5 kvA voltage stabilizer.
10. The unit must be CE marked.
11. Electric supply: 220-230V/50 Hz.
12. Warranty two years from the date of installation.

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

## Item No 9: Chemical Fume Hood

### Specifications:

1. Chemical fume hood nominal size: 5ft/1.5 m
2. External dimension [WxDxH (inch)]: 50-70" X 30-40" X 50-75"
3. Internal work area [WxDxH (inch)]: 50-60" X 25-30" X 45-55"
4. Maximum sash opening 25-30".
5. Face velocity: 0.4-0.5m/s (80-100 fpm) at full sash opening.
6. Static pressure required: Sash opening 15-20", exhausts should be 500-600 CFM at 0.10-0.15" static pressure, while with sash opening 25-30" high, exhausts 900-1000CFM at 0.30-0.50" static pressure.
7. Exhaust outlet diameter: 10-20"
8. Number of exhaust collar: one
9. Exhaust ducting work and connection accessories should also be quoted.
10. Construction:
  - 10.1. Internal chamber should be constructed from stainless steel of 304 grades.
  - 10.2. Hood lighting system should be fluorescent or LED light.
11. Electrical socket outlets: Two: 5/8 and 15Amp
12. Electrical: 220-240 V, AC, 50-60 Hz.
13. Certification: ASHRAE/EN14175-3 standards/ UL/ EFI/ CE/UL certified.
14. Hood should have factory fitted valve and hose with wall mounted outlet for gas inlet, a vacuum inlet, water inlet, and nitrogen.
15. **Base cabinetry, 5 ft/1.5 m, for additional storage:** -  
Base cabinetry should be partitioned into vertical cabinets.
16. Warranty: Two years after installation.

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

## **Item No 10: 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 60 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 1-3 cm<sup>2</sup>, probing rod, load cell/force sensor, depth reference plate and data logger for measuring penetration resistance of soil.
8. Penetration force: at least 800 N
9. Force resolution: 1 N or better
10. Data output: .txt or CSV format
11. Probing rods of appropriate diameter for different cones
12. Guides/Checks for detection of cone wear
13. Capacity to store at least 1000 readings.
14. Interface Cable and Software for downloading data to PC
15. It should have powerful rechargeable battery for in-field operations and to be supplied complete with a sturdy carrying case and necessary tools.
16. Optional: 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. The soil moisture sensor/probe should have a measuring range of at least up to 50% volumetric soil moisture content, accuracy < +/- 5%.
17. Quote for Soil Moisture Probe / sensor separately.
18. Quote for spare cones separately as accessories,
19. All standard accessories to be included.
20. A standard factory calibration certificate should be provided.
21. The firm shall submit necessary catalogues, list of customers and product data sheets along with the offer.

Warranty: minimum 2 years

### **Item No 11: SPAD Chlorophyll meter**

#### **Specifications:**

1. Equipment should be suitable for the measurement of chlorophyll content or greenness of plant leaves.
2. Measurement area: 2mm X 2mm or more.
3. It should be suitable for leaves having thickness of 0.8-1.0 mm or greater range.
4. Accuracy:  $\pm 3\%$  within 0-100 SPAD units.
5. Display: LCD panel with minimum 3-digit measurement value.
6. Display range: 0-100 SPAD units or better.
7. Operating temperature: 30 to 50 °C or greater range.
8. With warning buzzer or alternative warning indicator.
9. A standard factory calibration certificate should be provided.
10. The firm shall submit necessary catalogues and product data sheets along with the offer.
11. Equipment should be provided with all the standard accessories, optional quote for accessories may be provided if required.
12. Warranty: minimum 2 years.
13. Optional: data logger facility to store at least 3000 measurements.

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

## **Item No 12: 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.
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.
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  $\leq 20$  ul, Whole blood  $\leq 15$  ul.
8. Throughput: at least 25 samples per hour
9. Display: Colour LCD/LED display
10. Carryover: WBC,RBC,HGB  $\leq 0.5\%$ , PLT  $\leq 1\%$
11. Input /Output: RS232 X 2, 1parallel printer, 1 barcode scanner, 1 keyboard and their interface.
12. Printer: With various printout formats along with printer.
13. Operating environment: Temperature:  $15^{\circ}$  C- $40^{\circ}$  C
14. Power Requirement : 100-240V  $\sim$  50/60 Hz
15. The machine should accompany UPS (for at least 1 hr) in case of power interruptions.
16. There should be a warranty period of two years for repair and maintenance from the date of installation.

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

### **Item No 13: Rotary Microtome**

#### Specifications:

1. Rotary Microtome designed for all applications of paraffin and hard specimens in research.
2. Consistent sectioning speed.
3. Sectioning of super mega cassettes and should supports safer specimen changing.
4. Knife holder accepts either high or low profile disposable blades.
5. Calibrated controls for precise specimen orientation.
6. Disposable Blade carrier universal cassette clamp.
7. Sectioning range: 0.5 to 100 $\mu$ m trim.
8. Trimming increment: 10u, 50u or more.
9. Section resolution 5 to 500  $\mu$ m.
10. Electrical requirements 100-240 V 50-60 Hz.
11. Digital display to monitor a range of functions including cutting speed section count section thickness and advance distance.
12. There should be a warranty period of two years for repair and maintenance.

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

## **Item No 14: Microscope (Light)**

### Specifications:

1. A Research (light) Upright Microscope with transmitted light LED at least 5W illumination with long life of 1,00,000 hours is needed for routine 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 X/Y mechanical stage should work as right hand operation and left hand operation.
7. It should have a trinocular phototube with beam splitter.
8. It should have Eyepiece pair 10x/20 or better
9. It should have Infinity corrected Objectives suitable for Phase & Fluorescence: 4x, 10x, 20, 40x & 100x Oil Immersion.
10. The quoted model should be upgradable for fluorescence etc.
11. It should be provided with 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.
12. The camera and microscope should be controllable through single software.
13. Microscope, camera and software should be of superior quality and should better synchronization.
14. Latest best suitable PC to be supplied as per camera requirement along with the graphics card.
15. Vendor should ensure at least 24 months warranty w.e.f date of installation Vendor should attached list of user for this model and all the technical document in support of technical bid

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

**Item No 15: Laminar Airflow****Specifications:**

1. Vertical laminar flow cabinet with steel body and base stand.
2. Certifications: UL or CE or other national standards agency.
3. Should have stainless steel working bench having working area dimensions of approx. 4ft x 2ft.
4. HEPA filter with efficiency of 99.99% at 0.3 micron; washable pre-filter; average air velocity should be 90-100 fpm.
5. Should have anti-UV foldable/sash-opening type front cover.
6. Should have service ports and gas port.
7. Should have LED display.
8. Should be fitted with UV germicidal light and white/fluorescent light illumination.
9. Noise level: less than 65 dBA.
10. Electric supply: 230V/ 50-60 Hz.
11. Minimum of three years warranty from the date of installation

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

## **Item No 16: 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 and air.
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 of interior lighting and at least one 230V plugs/receptacles on interior side.
14. Provision of pressure sensors to detect changes in inflow/exhaust or downflow with alarm signals.
15. Electric supply: 230V/ 50-60 Hz.
16. Warranty 2 years from the date of installation.
17. Suitable high quality online UPS capable of providing at least 30 minutes of power back-up for biosafety cabinet to be supplied.

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

### **Item No 17: Deep Freezer -20°C**

#### **Specifications:**

1. Net Capacity: at least 300 litres.
2. Temperature: -20°C or less. Freezer should be set to -20°C at the time of installation.
3. Upright type and solid single/double door model.
4. Freezers should be suitable for storing laboratory reagents and biological materials.
5. Should have minimum four adjustable internal shelves/baskets.
6. Should have digital temperature display and high/low temperature alarms, alarms for power failure.
7. Environmentally safe refrigerant mixtures CFC-FREE, HCFC-FREE refrigerants should be used in freezer.
8. Certifications: UL or CE or other national standards agency.
9. Electric supply: 220-230V/ 50 Hz.
10. Suitable high quality voltage stabilizer with time delay function should be provided.
11. Warranty 3 years from the date of installation and on-site repair services as and when required.

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

## **Item No 18: Western Blot**

### **Specifications:**

1. Quality protein transfer in 3 min – transfer 1-4 mini gels or 1-2 gels in a single run
2. Dry blotting instrument with 2 blotting cassettes and blot roller
3. FAST Blotting system with four gel simultaneously, 2 different protocols at same time
4. Input power: 100–240 VAC, 276 VA, 50–60 Hz, 175 W max
5. Cooling fan: required
6. inbuilt PowerPac supply
7. Preprogrammed methods: Standard SD, 1.5 mm gels, High MW, Low MW, Mixed MW,
8. Programmable methods: Up to 25 user-defined
9. User Interface -- 128 x 64 pixel monochrome display
10. Audible alarm: required
11. User notifications like Power fail during run, No-load detection and End of run
12. Consumables – ready to use transfer packs for PVDF membrane sufficient for 40 transfers
13. Transfer packs must include thick blot paper, filter paper and PVDF membrane

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

**Item No 19: Deep Freezer (-20° C)****Specifications:**

1. Net Capacity: at least 300 litres.
2. Temperature: -20°C.
3. Upright type and solid single door model.
4. Freezers should be suitable for storing laboratory reagents and biological materials.
5. Should have minimum four adjustable internal shelves/baskets.
6. Should have digital temperature display and high/low temperature alarms, alarms for power failure.
7. Environmentally safe refrigerant mixtures CFC-FREE, HCFC-FREE refrigerants should be used in freezer.
8. Certifications: UL or CE and national standards
9. Electric supply: 220-230V/ 50 Hz.
10. Suitable high quality voltage stabilizer with time delay function should be provided.
11. Warranty 3 years from the date of installation and on-site repair services as and when required.

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

## **Item No 20: Real Time PCR**

### **Specifications:**

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

22. Warranty: At least 3 years warranty from the date of installation.

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

**Item No 21: 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 220 grams/ 0.001-220 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 provides on screen guidance to help the user level the balance correctly within seconds.
3. The balance should have a 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 movable walled fibre or glass protection for minimizing the external errors during weighing
7. It should have tare function for reducing the time for weighing separate samples
8. It should have weigh mode switch function for selection of preferred weighing unit (mg/gm).
9. Warranty should be 2 years w.e.f date of installation

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

**Item No 22: Microscope Fluorescent Specifications:**

1. Research Microscope stands for Biology with transmitted light LED at least 4W illumination with long life of more than 1, 00,000 hours.
2. 3-step focus drive coarse, medium & Fine adjustment with focus torque adjustment
3. Objective nosepiece for 6/7 or better objectives
4. DIC turret to be available with empty DIC slots.
5. Infinity corrected / Harmonic Corrected (HC) Optical System
6. Universal Condenser 0.90/1.25 Oil, Colour Coded with Condenser lens & accommodation for DIC prism, Phase rings with rotatable Polarizer & analyzer.
7. X/Y mechanical stage either for right hand operation or for left hand operation
8. Trinocular phototube with beam splitter. Provision to adapt two cameras simultaneously.
9. Eyepiece pair 10x/22 or better
10. Immersion Oil - 20ml
11. Infinity corrected Objectives suitable for DIC, Phase & Fluorescence: Fluorite / Semi Apo 4x, 10x, 20X, 40x & 100x (oil). objectives should be with fluorescence or better
12. Dust cover for the complete set
13. Ultra high pressure Hg-Lamp, HG 100W, Fluorescence Filter turret should be at least 5- positions or more. Along with 5 or more position.
14. Neutral Density filters to control Fluorescence Intensity to be incorporated into the microscope.
15. Fluorescence zero pixel shift free filters for DAPI, FITC and TRITC with band pass.
16. High sensitive and high speed Monochromatic cooled digital camera with a CCD sensor of minimum 1.3 / 1.4 mPixel resolution. Speed shall be 22 fps or higher in full frame or better Peltier cooling shall be available. The camera should be controllable from Komet assay software.
17. Digital USB Colour digital camera for on-screen microscope image display; 2048 x 1536 with 3.1 M Pixels, Exposure time 2 m sec- 2 sec, A/D converter 10 bit, dynamic range >45dB, Max.15 frames per sec, Gain 1x - 20x, shading correction,

CMOS sensor progressive scan, Pixel Size – 3.2 um x 3.2 um, Colour depth 24 bits  
Colour filter RGB,

18. Software should meet wide variety of multidimensional imaging requirements like multi-channel acquisition, time lapse imaging, basic analysis to capture uneven surface, feature like annotations and labeling, distance measurement, area, and perimeter.
19. A latest configuration computer system with 2 TB hard drive, core i7 processor, frequency 3.6 GHz. Or better, at least 8 GB RAM memory and Monitor 27” should be provided.
20. Compatibility with comet assay procedure
21. Warranty should be at least 3 years

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

**Item No 23: Centrifuge****Specifications:**

Max. Speed (rpm)	10000-18000
Capacity (ml)	Min 50
Min. Temperature (°C)	-15- (-10) to 40
Dimensions WxDxH (mm)	450-500x 550-600 x 500-550
Voltage Stabilizers	Required
Supply	220-240 Volts 40-50 Hz single Phase
Rotors/Adaptor	5, 15, 50 ml
Warranty	2 Years

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

**Item No 24: Water Bath****Specifications:**

1. Temperature Range 0 +100°C
2. Cooling Capacity-250-270w
3. Volume Min-20 L
4. Voltage-230-250 V
5. Max. Pressure-approax300 mbar/4.35psi
6. Certifications/Compliance-CE/ROHS/WEEE/other national std agency
7. Safety Class-1/NFL
8. Temperature Stability- Approx 0.02°C
9. Flow Rate -17-20 L/min.
10. Electrical Requirements 220V 40-50 Hz
11. Warranty 2 years

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

## **Item No 25: Gel Electrophoresis Unit- Horizontal**

### **Specifications:**

1. Use for single cell comet assay, DNA and protein separation
2. Removable buffer circulation cassettes
3. Inbuilt levelling mechanism
4. Buffer requirement:900-1000 mL
5. Lid
6. Tank with two dual male connectors per electrode and a levelling arrangement
7. Two trays with slot to lift slides (each of size 21 (w) × 9 (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
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 levelling table with spirit-level
8. Warranty should be at least 2 years

### **Power supply**

1. Output range upto 220 V, 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 year

### **Peristaltic pump**

1. Peristaltic pump with variable speed and silicon tubing,
2. Bi-directional continuous operation,

3. LED display and timer.
4. Flow rate: 450 mL/min silicon tubing with 7 mm diameter.

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

## **Item No 26: UV-VIS Spectrophotometer**

### **Specifications:**

1. That can measure the concentration and purity of nucleic acids, tissue sample, protein samples and the density of bacterial cell cultures at a broad range of sample volumes.
2. It should be pre-programmed with a range of standard methods for the convenient quantification of proteins, nucleic acids, and bacterial cell cultures.
3. In addition, there has to be the flexibility to design and store methods Double beam optical system.
4. Wavelength range 190- 1100 nm.
5. Wavelength calibration automatic upon switch on.
6. Spectral bandwidth 1 nm.
7. Wavelength accuracy  $\pm 0.1$  nm.
8. Wavelength reproducibility  $\pm 0.15$  nm.
9. Light source of Xenon lamp/ halogen-deuterium lamp.
10. Detector with CCD Array/ PMT/ photodiode.
11. Option for data transfer to PC.
12. Power requirements 100–240 V ( $\pm 10\%$ ), 50/60 Hz.
13. Supplied with 5 sets of quartz cuvettes and glass cuvet for sample volume of 500  $\mu$ l - 2 ml.
14. A latest configuration computer system with 2 TB hard drive, core i7 processor, frequency 3.6 GHz. Or better, at least 8 GB RAM memory and Monitor 27" should be provided with printer.
15. Warranty should be at least 3 years.

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

### **Item No 27: 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 8 GB Ram.
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. 2 years warranty for software and dongle.

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

**Item No 28: 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: $\pm 0.05$ pH
	Accuracy: At least $\pm 0.1$ 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: 0-50 g/L

Total Dissolved Solids (TDS)	Resolution- At least 0.1%F.S
	Repeatability- At least $\pm 3$ g/L
	Accuracy- At least $\pm 5$ g/L
Seawater specific gravity	Range- At least 0~50
	Resolution- At least 0.1
	Repeatability- At least 2
	Accuracy- At least $\pm 5$
Temperature	Range- At least 0~55°C
	Resolution- At least 0.01°C
	Repeatability- At least $\pm 0.3$ °C
	Accuracy- At least $\pm 1.0$ °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 monitoring system with superior measurement principles and capable to measure more water quality parameters is preferable	

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

**Item No 29: Deep Freezer (-20°C)****Specifications:**

1. Net Capacity: atleast 300 litres.
2. Temperature: -20°C.
3. Upright type and solid single door model.
4. Freezers should be suitable for storing laboratory reagents and biological materials.
5. Should have minimum four adjustable internal shelves/baskets.
6. Should have digital temperature display and high/low temperature alarms, alarms for power failure.
7. Environmentally safe refrigerant mixtures CFC-FREE, HCFC-FREE refrigerants should be used in freezer.
8. Certifications: UL or CE.
9. Electric supply: 220-230V/ 50 Hz.
10. Suitable high quality voltage stabilizer with time delay function should be provided.
11. Warranty 3 years from the date of installation and on-site repair services as and when required.

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

### **Item No 30: Texture Analyzer**

#### **Specifications:**

1. Force (load cell capacity)- 1 to 700 kg with 0.1 to 15 g resolution and  $\pm 0.5\%$  load accuracy
2. Load cells; ranged between (1 to 700 kg) e.g.  $\pm 1, 5, 30, 50, 100, 250, 500$  kg etc.
3. Speed: 0.01 to 20 mm/sec with better accuracy (up to 0.1%)
4. Operating modes: Tension or Compression (measurement of force and distance)
5. Display: simultaneous speed, force plots etc.
6. Position setting: Positional range setting/travelling length: 0.01-520 mm at 0.001 mm resolution. Oversampled at 8000 samples/second
7. Library with wide range of programme (TPA, adhesive, fatigue cycling and stress relaxation)
8. Data input and output USB ports for data transfer
9. Operating temperature range: 0- 39.5°C
10. Dimensions size: about 950 x 480 x 330 mm
11. Weight: 25 -50 kg
12. Power supply 220-240v (AC)
13. Data logger with suitable software package (Texture Export Exceed software programs for data analysis) etc.

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

**Item No 31: Sprayer-Tractor Operated (Mounted Blower)**

**Specifications:**

1. Tractor operated mounted blower
2. High resistant heavy duty plastic tank 200-300Lt
3. Stainless steel fan assembly min. 600mm dia.
4. High speed gear box, hydraulic tank mixing and pressure regulator
5. Anti-drip spray nozzles (min. 12 Nos.)
6. Heavy duty diaphragm or equivalent ceramic plunger pump with all accessories.

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

**Item No 32: Power tiller with accessories**

**Specifications:**

1. Power tiller with 10 to 15hp4-stroke, water cooled, direct injection, diesel engine.
2. Equipped with following accessories/ attachments;
  - a. Rotavator
  - b. Plough
  - c. Ridger
  - d. Reaper/ Grass cutter
  - e. Seat for power tiller

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

**Item No 33: Mini Tractor with accessories & attachments**

**Specifications:**

1. Mini tractor 24 to 30hp, liquid cooled 3-cylinder diesel engine, four wheel drive with integral power steering and variable PTO speed with accessories.
2. Equipped with following attachments;
  - a. Rotavator with tilling width 1 to 1.2mt, L-shaped blades not less than 20 Nos.
  - b. Cultivator
  - c. Plough
  - d. Seed drill
  - e. Mini trailor

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

**Item No 34: Deep Freezer -20C****Specifications:**

1. Net Capacity: atleast 300 litres.
2. Temperature: -20°C or less. Freezer should be set to -20°C at the time of installation.
3. Upright type and solid single/double door model.
4. Freezers should be suitable for storing laboratory reagents and biological materials.
5. Should have minimum four adjustable internal shelves/baskets.
6. Should have digital temperature display and high/low temperature alarms, alarms for power failure.
7. Environmentally safe refrigerant mixtures CFC-FREE, HCFC-FREE refrigerants should be used in freezer.
8. Certifications: UL or CE or standards agency.
9. Electric supply: 220-230V/ 50 Hz.
10. Suitable high quality voltage stabilizer with time delay function should be provided.
11. Warranty 3 years from the date of installation and on-site repair services as and when required.

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

## Item No 35: CO2 Incubator

### Specifications:

1. Total capacity of the incubator must be between: **150-200ltrs.**
2. The incubator should be bench type constructed using **corrosion free resistant stainless steel**
3. The chamber should be provided with sealed inner glass door facility with appropriate closing system to minimize loss of gases.
4. Shelf material should be perforated and made up of stainless steel which can be easily removed/ reassembled for routine cleaning/sterilization.
5. The chamber should have **4-6 numbers** of shelves along with fanless direct heating system and gentle circulation.
6. Provision of temperature range in the incubator: Ambient+5°C – 50°C
7. Temperature uniformity should not fluctuate beyond  $\pm 0.3$  °C
8. The incubator to be equipped with highly stable long lasting appropriate type of gas sensor.
9. Provision of CO2 range 0.2 – 20 % should be provided
10. CO2 uniformity should not fluctuate beyond  $\pm 0.1\%$
11. Provision of user interface parameter display board made up of LCD/LED. It should be bright and easy to read simplifying daily operation for researchers with improved access to incubator functions and information.
12. The display should provide information specific to performance, should do data and error logging, provide convenient on-screen operational prompts, and provide user specific electronic security.
13. All control and measurement probes and sensors should be located directly inside the culture chamber to provide true and accurate process data and foster faster parameter recovery times.
14. Incubator should be equipped with programmable tracking alarms for critical temperature and CO<sub>2</sub> control parameters, which can be custom configured to meet the needs of changing research requirements.
15. The chamber should accompany **one CO<sub>2</sub>Cylinders, in-line two stage CO<sub>2</sub> gas regulators** with auto-change over controllers and online HEPA filters.
16. The chamber to have electrical requirements: 200-250V, 50/60 Hz.
17. The incubator should have the facility for security system from over temperature cut off. It should also have automatic re-setting of the pre-set parameters in case of power failure.
18. The CO<sub>2</sub> incubator should accompany **appropriate UPS to keep functional (for 30 min)** in case of power failure.

19. To prevent unauthorized alterations/changes in freezers settings, there should be key operated set point security system.
20. Suitable high quality **voltage stabilizer with time delay function** should be provided.
21. **Qualified installation and service maintenance** assistance to be included along with the instrument.
22. Warranty **2 years** from the date of installation and on-site repair services as and when required.
23. Vendors are requested to attach **original technical literature/ catalogue** in support of the mentioned specifications and highlight the above features.
24. **Indian users list** for equipment should be provided as essential requirement.

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

### **Item No 36: Deep Freezer -80C**

#### **Specifications:**

1. Capacity: 500 litres or more.
2. Temperature range: -50°C to -85°C.
3. Upright type.
4. Refrigerant: CFC/HCFC free, environmentally-friendly and non-flammable.
5. Interior: painted stainless steel with minimum three adjustable shelves and four polystyrene insulated inner doors to maintain cabinet temperature when external door is opened.
6. Vacuum insulated panel, high-impact, scratch resistant powder coat finished exterior to ensure long-term durability.
7. Operating temperature: Programmable up to -85°C with 1°C increments at ambient temperature of 30°C.
8. Heated air vent to prevent vacuum formation during door openings and front panel air filter.
9. Alarms: Audible and visible alarms for temperature, power failure, system failure, probe failure, filter clean, door.
10. Touch-screen user interface for providing access to vital freezer information including event log, settings and user profiles.
11. Built-in USB port for downloading freezer log report and freezer settings from one freezer to another.
12. Provision of on-board computer to store temperature and event data.
13. Preferably heated outer door gasket for eliminating frost build-up.
14. Certification/compliance/Regulatory approval: Machine should be cULus and CE certified/ listed.
15. There should be provision for easy to remove and washable filters.
16. Single outer door and single hand ergonomic door handle operation with integrated key lock.
17. Power management system should protect a wide range of voltage variation and should be easily accessible through the touch-screen display.

18. Freezer should not warm to  $-50^{\circ}\text{C}$  from  $-80^{\circ}\text{C}$  set point in under 200-240 minutes during a power failure at ambient temperature of  $25^{\circ}\text{C}$ - $30^{\circ}\text{C}$ .
19. Electric supply: 220-230V/50 Hz.
20. Should have provision for optional  $\text{CO}_2$  or  $\text{LN}_2$  safety back-up system for additional protection in the event of a power or mechanical failure.
21. Following accessories should also be supplied: Sliding drawer racks for 2 inch boxes, holding capacity 22-25 boxes/rack (two racks); Sliding drawer racks for 3 inch boxes, holding capacity 12-15 boxes/rack (two racks); High quality, water repellent 2 inch boxes (with at least 81 places) sufficient for two racks; High quality, water repellent 3 inch boxes (with at least 64-81 places) sufficient for two racks; High quality stainless steel drawer racks should be supplied; Cryo Gloves- medium size (two pairs).
22. Suitable high quality voltage stabilizer with time delay function should be provided. Warranty 3 years from the date of installation and on-site repair services as and when required.

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

**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>
	<u>a</u>	<u>B</u>	<u>c</u>	<u>d</u>	<u>e</u>	<u>f</u>				
Item Description Country of origin	<u>Accounting unit &amp; quantity</u>	Exfactory / exware-House/ex - showroom off the shelf	<u>Excise duty</u> if any	<u>Packing and forwarding</u> g	<u>Inland transportation</u> n	<u>Insurance other duties and taxes, if any (other than sales tax and incidental costs)</u> (e)	<u>Incidental services (including supervision)</u> n)	<u>Overall unit price</u> a+b+c+d+ e+f]	<u>Total price</u> 2X9	<u>Sales tax payable if contract is 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 & quanty	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