भा. कृ. अ. प. - राष्ट्रीय अजैविक स्ट्रैस प्रबंधन संस्थान
मालेगांव, बारामती - 413115, पुणे, महाराष्ट्र, भारत
ICAR - National Institute of Abiotic Stress Management
Malegaon, Baramati- 413115, Pune, Maharashtra, India

F.No: 4-6/2016-17 **Date: 17.08.2016**

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 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(Rs)
1.	Digital Cone Penetrometer	1	15000/-
2.	Rotary Microtome	1	20000/-
3.	Microscope (Light)	1	20000/-
4.	Automated Blood Analyzer	1	10000/-
5.	Gel Electrophoresis Unit-Horizontal	1	12000/-
6.	Comet Software with Dongal	1	7000/-
7.	Cold rooms and seed storage modules	1	70000/-
8.	Greenhouse with controlled environmental conditions	4	320000/-
9.	Microscope: Confocal Laser Scanning	1	240000/-
10.	Sap Flow Sensors	45	80000/-
11.	Soil Tensiometer System	1	10000/-
12.	UV-VIS Spectrophotometer	1	10000/-
13.	Real Time PCR	1	40000/-
14.	Water Activity Meter	1	15000/-

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 **17.08.2016** between **10:00 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 **12.09.2016** up to 1**2.00 Noon**
4. The last date of receipt of complete sealed tenders is **12.09.2016** up to **02.00 PM**
5. The process of opening of the technical bid will be on **12.09.2016** at **2.30 PM**
6. **Pre-bid for item no 7,8,9&10 will be as per schedule given in tender document.**

-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 **17.08.2016** FROM 10.00 HRS TO 16.30 HRS ON ALL WORKING DAYS AT THIS INSTITUTE

LAST DATE OF SALE OF TENDER FORM: **12.09.2016** UP TO 12.00 Noon

LAST DATE AND TIME FOR ACCEPTANCE OF SEALED TENDER DOCUMENT IS ON **12.09.2016** UP TO 02.00 PM

DATE OF OPENING OF TECHNICAL BID WILL BE ON **12.09.2016** 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

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".** 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 12.09.2016 till 02.00 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 12.09.2016 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 Draft/ DD 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: warranty should be** from the date of installation.
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 at least three 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.

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

PRE BID MEETING

It is proposed to convene a pre bid conference on as per schedule given below:

S. No	Name of Equipment	Date and time
1	Green house with controlled environmental conditions	26/08/2016 10:00 AM to 1:00 PM
2	Microscope: Confocal Laser Scanning	26/08/2016 02:00 PM to 5:00 PM
3	Cold rooms and seed storage modules	27/08/2016 10:00 AM to 1:00 PM
4	Sap Flow Sensors	27/08/2016 02:00 PM to 5:00 PM

Prospective bidders are advised to submit their doubts. Questions/ clarifications, if any, through Mail (Mail ID: niasmao@gmail.com) before the date of pre bid conference. Subsequently on the date of the conference, the questions should be given in writing. Bidders can raise supplementary questions during the course of the conference. From our side we would like to seek advice/ suggestions from the bidders about the specification, working of instruments. Minutes of the Meeting, including the text of the clarifications sought and the response given by the NIASM will be notified in the NIASM website. Any Modification in the Bidding document which may become necessary as a result of the pre bid meeting shall be made known to all the bidders by the NIASM through a notification of the amendment in the website of the NIASM.

Annexure- I: Technical Specifications

Item No 1: 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^2, 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 year

Item No 2: 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 100µm trim
8. Trimming increment: 10u, 50u or more
9. Section resolution 5 to 500 µm
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 from the date of installation.

Item No 03: Microscope (Light)

Specifications:

1. A Research Fluorescence (light) Upright Microscope with transmitted light LED at least 5W illumination with long life.
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. System should have Infinity corrected Optical System.
5. The X/Y mechanical stage should work as right hand operation and left hand operation.
6. It should have a trinocular phototube with beam splitter
7. It should have Eyepiece pair 10x/20 or better
8. It should have Infinity corrected Objectives suitable for Phase & microscopy: 4x, 10x 20, 40x, 40x &100x. Oil Immersion.
9. A suitable dust protective cover for the complete unit should be supplied
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 definition and Resolution 10 MP or better, with a provision of software interpolation, 1/2.3" scan with software kit, colour filter RGB. Fire wire or USB connection to PC which should upgradable to other s/w modules in future. Preview images on an HD monitor, Projector, Saving should be directly on SD card to be supplied.
12. The camera and microscope should be controllable through single software.
13. Microscope, camera and software should be offer from a single manufacture for 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.

Item No 04: Automated 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 display.
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, PLT.
4. Multispecies additional parameters for other species also.
5. Histograms for WBC, RBC and PLT.
6. Principles should include electrical impedance method for counting or other advance methods.
7. Sample Volume: minimum.
8. Throughput: High.
9. Display: Colour LCD/LED display
10. Input /Output: RS232 X 2, 1parallel printer, 1 keyboard and their interface.
11. Printer: With various printout formats along with printer.
12. Operating environment: Temperature: 15^0 C-40^0 C
13. Power Requirement : 100-250V ~ 50/60 Hz
14. The machine should accompany UPS (for at least 1 hr) in case of power interruptions.
15. There should be a warranty period of two years for repair and maintenance from the date of installation.

Item No 5: 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 at least (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.

Item No 06: 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.

Item No 07: Cold rooms and seed storage modules

Specifications:

S. No	Product technical details
1.	**Size:** External :10’ X 8’ X 8’ (L X W X H) Internal working space: 9.7’ X 7.7’ X 7.7’ (L X W X H)
2	**Room temperature:** 0°C to 10°C **Temperature monitoring and control:** Temperature monitoring and Alarm system outside the door. Communication for out of range temperature with alarm. Data logger system with USB interfaces.
3	**Insulation materials and insulation type:** The Insulation for Walls, Ceiling & Floor shall be 60 mm PUF Panels with Silicon sealant application for leak proof joints**.** 60 MM thick PUF for cooler room pre- fab pre painted PPGI panels for walls, ceiling outer and stainless steel inner. 0.5mm Pre-painted GI sheet PUF panels with 60 MM thick having uniform foam density of 40+/-2KG/M3 for walls & ceiling while floor will have marine ply with 1.2 mm aluminium chequred plate,above PPGI+PUF panels.
4	**Door:** Single leaf hinged and- flush type of size 34" x 78", cam lock, sweep/magnetic gasket flexible, posi lock with heaters & Ramp facility and safety release device. Human trap alarm. **Door hinges & handle:** Heavy duty cast alloy chrome finish.
5	**Light source:** Moisture proof light fixture inner side- 2 nos at least 40 watt two tube fluorescent light/LED light.
6	**Refrigeration systems/Cooling System:** The unit should maintain a temperature between $+0^{o}C$ to $10^{o}C$. Air cooling system should be split type. Should enable a good Air flow Pressurize and leak test the entire refrigeration system.
	Condensing: UV and corrosion resistance, inner grooved copper tubes, in-built safety and control device, Weather proof canopy **Evaporator unit:** Stainless steel body and excellent corrosion resistance, inner grooved copper tubes. Condensing units and evaporator coils to be from the same manufacturer .
7	**Regulation and Control System:** The electronic digital regulation system should be provided with working temperature set control LED signal to display alarm system intervention. Internal temperature digital display. All refrigeration piping required shall be furnished and installed by the walk-in manufacture .
8	**Safety Mechanism** Visual alarm system for min-max internal temperature setting. System should have internal vapour proof lighting facility. Sealed all joints, openings, piping, electrical and ductwork penetrations (regardless of trade). Sealed internal electrical conduit for power outlet.
9	**Ducting and Drains** The firm should take the responsibility of refrigeration piping. The firm should also take up minor civil works if required for fabrication, grouting of frame, platform for condensing, and evaporator units and drain systems.
	Racks and Shelves

	Firm should supply suitable stainless steel racks two side walls of cold room. The racks should have four shelves. Approximate sizes of racks-Total Height – 5 - 6 ft, Shelf size - Depth 15 inches, Height between shelves - 15 inches. Firm should also supply the Modular tables, 1200 x 1500 x 900 mm, with granite top,leg space, drawers, for complete one side wall of cold room.
10	**Electricity supply:** Accessories such as suitable MCB, MCB board, about 50 m 6 mm square wire (4 No. of different colours) should also be provided 230 V, 3 PH, 50 HZ.
11	**Technical literature:** The firm must submit illustrated technical literature with enough technical details. All equipment should be ISI/ISO certified.
12	**Warranty:** The supplier shall guarantee satisfactory performances of the unit for the minimum period of 24 months from the date of installation and shall undertake to rectify any defect including replacement of spare parts, resulting from faulty design, poor workmanship, bad materials etc. during the guarantee period free of charge.

Item No 08: Greenhouse with controlled environmental conditions

Specifications:

S.No	Product technical details
1.	**<u>High Tech Greenhouse should be constructed as per guidelines of DBT, Govt. of India</u>** **STRUCTURE AND DIMENSIONS:** **Total Area of Greenhouse:** 240 m^2 **Size:** 10m. × 24m. (L × W) **Each Chamber Size:** 10 m x 8 m (L × W) = 80 m^2 **No. of Bays:** 3 Nos. **Bay width:** 8 m. **Length:** 10 m **Width:** 8 m **Side Height:** 3.5 m **Centre Height:** 4.7 m **Design/Shape:** Venlo **Double Door Room No.1:** 2 m x 5m x 2.43m (L ×W×H) **Double Door Room No.2:** 2.1m x 2.1m x 2.43m (L ×W×H) **Doors:** 1.9m x 0.91m (tall & wide) **Frame: G**alvanized steel should be used and designed as per IS875 standards to withstand of wind speed 120 km/hour. End wall and side wall framing Aluminum corner trims, aluminum ridge bar and Galvanized gutter trim Brackets & fasteners to assemble frame. **1) Pipe:Pipes sections to be used for different Structural Member should be as below or equivalent :** a) Columns: 80 mm × 50 mm in 2 mm thick hot dip galvanized pipe. b) Trusses: Bottom cord 32 mm x 2 mm; Truss Members 48 mm × 48 mm, Bracing 25 mm, pipe; structural member should be fitted with zinc plated nuts & bolts without welding. c) Purlins: 32 mm × 2 mm thick. **2) All G.I pipes should be galvanized.** **3) Nuts and other metallic parts:** This should include all the elements required for joining and water tightens components (such as fittings, clamps, screws and nuts plated against corrosion).
2.	**DOUBLE DOOR ROOM:** **A) Double Door Room**) i) Size: 2 m x 5 m x 2.43 m (L×W×H) covered with 6 mm thick polycarbonate sheet. ii) Size: 2.1 m x 2.1 m x 2.43 m (L×W×H) covered with 6 mm thick polycarbonate sheet. **B) Sliding Door:** Size: 1.9m × 0.91m long & wide, lockable should be made with clear 6 mm polycarbonate glazing, top & bottom tracks, jambs, flashings & installation hardware **C) Air Curtain** with auto on/off when door opening /closing at main entry.
3.	**CLADDING:** **Roof, front wall, end wall, & sidewalls of the Greenhouse-sets and double room for rigid covering.** 6 mm thick clear multiwall polycarbonate sheet, Aluminum Profile, EPDM gasket, Silicon sealant, and accessories. Roof and Side wall should be covered by 6 mm, UV

	stabilized clear polycarbonate sheet, Details are giving below: **Sheet thickness**: 6 mm **Structure**: 2 TS **Approx. Weight g/m2:** 1300 **Light Transmission:** 81% **K Valve:** 3 **Detail of Thermo clear sheet** 2TS 1300 81 3 should be an impact resistant, energy saving, multiwall polycarbonate sheet. It should have property to provide almost total resistant against degradation caused by UV radiation in sunlight. The entire Thermo clear sheet range should carry at least Ten year warranty against discolorations, loss of light transmission, and / or loss of strength due to weathering. **Impact Strength:** Sheet should have outstanding impact performance over wide temperature range -40°C + 120°C and also after prolonged outdoor exposure. **Hail simulation:** As a roof and side glazing material polycarbonate sheet should be able to withstand extremes of weathers such as storms, hail stones, and wind. Under these conditions the product should be virtually unbreakable and able to accommodate the subsequent temperature changes to conditions without breaking or buckling. **Light Transmission:** The sunlight which reaches the surface of the earth has wavelength range between 295-2140nm. The optical window should be divided into the following section. **UVB Middle ultra violet region** 280-315 nm **UVA near ultra violet region** 215-380 nm **Visible light region** 380-780 nm 82% **Near Infra-red region** 780-1400 nm 82-20% **Middle Infra vix region** 1400-3000, Polycarbonate sheet is treated with exclusively antifungal treatment to enhance the life of sheet.
4.	**SHADING SYSTEM:** **A) External Shading:** 70:30% shading net (agro shade net) fixed type. **B) Internal Shading:** Reflective, thermal-aluminium-screen silver with a manually operated expanding & retracting mechanism inside the green house
5	**FOGGING SYSTEM:** Fogging System 1 HP heavy duty motor with screen filter, fogging nozzles, pipes, polymer water tank 500 ltr. (1 no. for each chamber).
6	**COOLING SYSTEM:** **A)** 1.5 mH × 24 m.W ×100mm thick evaporative CELDEC cooling pad complete with: - All necessary framing material of Aluminum required supporting distribution & returning piping. - Gutters, down spout end caps & drip pan, plumbing kit, pump 220 volt - 1 phase 50 cycles, Drilled PVC piping cap, pad retainer, all suspension hardware. - Metal flashings as required to seal pad to vent opening, 4" thick evaporative cooling pad material. - Pad Area: 24m.W ×1.5m H × 100mm thick(w × h × Thickness) **Construction Material :** Aluminum Profiles: Tray Sides, Top Etc. Plastic Profiles: Water Distribution tray. Cooling Media: 100mm thick celdek 7090/500 At velocities of 1 to 3 M/s to give efficiency from 60 to 95%. Filtration: 25 to 55mm viscous filter for 30 m efficiency. Miscellaneous: Fasteners, Galvanized, Rivet- Aluminum.

	Water storage Tank: PVC Tank 500 liters. Pump: 1 HP Mono block (Crompton or approved equivalent) **B) Slow Speed Axial Flow Fan:** 48" single speed belt driven exhaust fan 1.5 hp, 220V, 50 cycles, 1 phase) 22,000 CFM (1 No. in each chamber). Cooling system detail: By this system temperature should be lowered by 10°C±2°C from outside when outside maximum humidity 62% of low and temperature 35°C or above whole cooling system based on CT 5000 Technology.
7	**LIGHT:** **A) Photosynthetically Active Radiation Lamp,** (PacRaTM/PAR) with PacRa W1.7 to 2.6/60, 40 watts or equivalent should be of specific action spectra lamps for photosynthesis with electronic gear for research. (10 Nos. in each chamber) **B) CFL**' one no should be fitted inside the buffer room for visibility during dark time.
8	**HEATING SYSTEM:** **Biotech Heat Convector Great,** By electric heat convector system **2.4 KW.** Complete uniform heat circulation system should be given, so that the heat can be blown in the complete area. Special heat convector system for maintaining required temperature. (03 Nos. in each chamber)
9	**CENTRALIZED CONTROL PANEL FOR AUTOMATION:** Monitor Panel should include Light, Temperature & Humidity Control System. Details of Microprocessor Photosynthesis Monitor Panel: **a) Technical feature of Photoperiodic Timer** - Cycle: 24 hrs minimum ON/OFF period 30 minutes. - Accuracy: ±10 sec/day - Input: 200-240 VAC, phase – single. - Ambient: 5°C to 45°C, RH up to 85% normally. **b) Technical feature of Temperature Control System** - Temp. Range: 0.1 to 59.9°C. - Accuracy: ±1°C. - Hysteresis: 0.4°C with sensor probe Pt-100 Sensor cord 5 meters. - Input: 200-240VAC, phase-single. - Ambient: 5°C to 45°C, RH up to 85% normally. **c) Relative Humidity Control System:** It maintains RH in the range of ±4%. - Range: 30% to 90%. - Real RH: ±2%. ±1 digit (at 45%). - Input: 220VAC, phase- single. - Ambient: 5° to 45°C, RH up to 95%. **d) Timer** for humidity.
10	**DATA LOGGER FOR TEMPERATURE AND HUMIDITY** For recording the data of Temperature and Relative Humidity
11	**PLANT WORK STATION:** **Plant Work Station for keeping plants pots,** Dimension: 7.1 m × 1.2 m × 0.75 m (L×W×H), fixed work station should be made by hot dip galvanized pipe. (4 Nos. in each chamber)
12	**DRIP IRRIGATION SYSTEM:** The system should be equipped with pressurized drip irrigation system with 2" Filter 120 mesh red, Valve/2", Fertilizer pump, Air valve/1.5", Pressure relief valve 2", Pressure gauge, Head unit assembly. Drip supply manifold with Valve/2" Aquanet Valve 2", Lateral 16 mm, Drip Net PC 16mmx30cmx1lph, RPVC 40 mm 6 Kg/cm2, RPVC 63 mm 4Kg/cm2, 1HP pump, PVC fitting, Water tanks etc.
13	**CIVIL WORK:**

	A) Foundation wall for all sides of Green House along with the double door room. WIDE Based 1.5’ below earth’s surface, 1.5’ above earth’s surface, as kick-board 9” wide. Frame base block height 2’. **B) Floor:** by tiled with dull white anti-slippery hard material along with the entry room. **C) Plinth Protection:** 2' wide all around the greenhouse along with buffer room.
14	**ELECTRICAL WIRING:** All wires should be of copper and desired load and switches should be of high quality/imported make, extra switches should also be provided as standby. Each feature should have own electric line with MCB and should be underground in PVC pipe complete set with A grade work. Separate electrical work, panel board and main switches as well.

Item No 09: 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 10-30 nm.
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: 2 TB, 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++ 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. i. Electrical: 220-240 VAC

ii. A suitable online UPS with 60 min backup should be provided.

iii. Warranty: Two years warranty including lasers must be offered.

Item No 10: Sap flow sensors

Specifications:

1. The Sap Flow Sensors/System should measure the sap flow from roots to shoot, reverse sap flow, low sap flow and zero sap flow in an effective way through varied range of stem diameters of three years old fruit crops viz. Sapota, Pomegranate, Guava, Grape, Papaya, Nagpur Mandrain, Sweet Orange, Acid lime etc.

2. The sensor length/diameter can be used for varying stem diameters of fruit crops should be same and sensors can be easily installed in fruit trees. It should not disturb the bark of stem in fruit trees.

3. Principle of measurement should be well defined and should be advanced, reliable and acceptable (supported with references in high impact journals).

4. The 45 minimum numbers of sensors considering varied range of stem diameters of fruit crops will be required. The rates should be quoted as per unit cost of sensor including data logger and essential accessories i.e. tool kit for fixing sensors. The rates should also be quoted for additional sensors, data logger and accessories/spare parts if needed. Accordingly, the rates for extension cables and necessary accessories should also be quoted. The carrying case should be provided for sensors and all necessary accessories.

5. Data logger should have continuous logging, storing and retrieving of stored information. The data can be easily transferred from data logger to portable data analysis system (Laptop/Note pad) through USB/Micro SD card for further analysis. Sap Flow tool software will be compatible with windows 7 and above. Data logger should be portable and battery powered. Remote data/wireless downloading system to be provided with storage for unattended operation in the data logger.

6. Portable data acquisition system (Laptop/Note pad) for onsite data loading, data retrieval, transfer and processing should be supplied.

7. All the essential accessories including tool kit for fixing the sensors and data logger, carrying case should be supplied with the system.

8. Supply for alternate source of energy like solar panel/external batteries/charger to be supplied for the system or data logger.

9. Installation, Training and Demonstration at site to be provided.

10. Warranty – Two years after installation. The post warranty service like Annual Maintenance Contract (AMC) should be quoted for next three years.

11. Original brochure mentioning detailed technical specification should be enclosed with the quotation.

12. List of users since last five years to be provided.

Item No 11: Soil tensiometer system

Specifications:

i. Tensiometer tubes : UV resistant plastic tubes
   15 cm depth
   30 cm depth
   45 cm depth
   60 cm depth
   75 cm depth
ii. Computer gauge: for reading and storing soil moisture tension readings from all tubes.
   - Measuring unit : KPa
   - Measuring range : 0-100 Kpa
   - Accuracy :<=1 %
   - Portable and battery operated
   - Display : LCD which displays Date, Time, Tube Number and reading in kPa
   - Software: Software which is compatible with Windows 7 and above for downloading readings and easily plotting graphs on computer.

iii. Accessories: Auger for installing tensiometer tubes in soil.
iv. Warranty: Two years from the date of installation.

Item No 12: 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. It should measure enzyme kinetics.
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 170- 800 nm or better.
5. Spectral bandwidth 1 nm.
6. Wavelength accuracy 0.8 nm or better.
7. Wavelength reproducibility ± 0.15 nm.
8. Light source of Xenon lamp/ halogen-deuterium/tungsten lamp.
9. Detector with CCD Array/PMT/silicon photodiode.
10. Power requirements 100–240 V (± 10%), 50/60 Hz.
11. Supplied with quartz cuvettes (2 sets of 0.5 ml and 3 ml each) and glass cuvette (2 sets of 0.5 ml and 3 ml each)
12. Spectrophotometer can be controlled by an external PC with latest configuration computer system with 1 TB hard drive, core i7, 3 GHz or better processor, at least 8 GB RAM memory and Monitor 24" should be provided with printer.
13. Warranty: At least 3 years warranty from the date of installation.
14. Photometric range -4 to +4 Abs
15. Wavelength Scanning speed 6000 to 1 nm/min
16. Should provide original technical literature/catalogue in support of technical specifications.
17. CE certified.
18. Should provide user list.
19. Noise level <0.00008 A
20. Dimension 450-650 mm (W) × 450-500mm (D) × 250-280 mm (H)

Item No 13: 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 minimum5 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 onsight 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 µl volume reaction
22. Warranty: At least 3 years warranty from the date of installation.

Item No 14: Water Quality Meter

Specifications:

1. Water Activity Range: 0.035 − 1.000
2. Water Activity Accuracy: ±0.015 to 0.0035
3. Water Activity Resolution: ±0.0001
4. Read Time ≤ 0-6 min.
5. Sample Temperature Range: 16 to 50 ◦C
6. Sample Temperature Accuracy: ±0.2 ◦C
7. Sample Dish Capacity: ≥10 ml
8. Full Operating Environment: 4 to 50 ◦C; 0 to 85% RH
9. Weight: ≤ 5 Kg
10. Digital display
11. Graphical Data Communications: USB and RS 232
12. Power: 110 to 220 VAC,
13. Warranty: Two years from the date of installation.

Annexure- II

PRICE SCHEDULE FOR DOMESTIC GOODS OR

GOODS OF FOREIGN ORIGIN LOCATED WITHIN INDIA

1	2	3 a	4 B	5 c	6 d	7 e	8 f	9	10	11
Item Description Country of origin	Accounting unit & quantity	Exfactory/ exware-House/ex-showroom off the shelf	Excise duty if any	Packing and forwarding	Inland transportation	Insurance other duties and taxes, if any(other than sales tax and incidental costs) (e)	Incidental services (including supervision)	Overall unit price [a+b+c+d+e+f]	Total price 2X9	Sales tax payble if contract is awarded

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 Description Country of origin	Accounting unit & quanty	Unit price FOB port of lading or loading which is correct	Unit price CIF at port of entry	Inland transportation charges, insurance and other local cost incidental to delivery, if specified	Incidental services including supervision	Overall unit price [b+c+d or a+c+d]	Total price 2X7	Indian agent name	Indian agent commission as a% of FOB price included in the quoted price

Total bid price in Rupees : (in figures)_____
(in words)……..

Place : Signature of bidder…….....

Date:
Name…….

Business address……

Note :

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