

Tender Form No:

**COLLEGE OF AGRICULTURAL ENGINEERING AND POST HARVEST TECHNOLOGY  
(CENTRAL AGRICULTURAL UNIVERSITY)  
(RANIPOOL, GANGTOK – 737 135 (SIKKIM))**



**TENDER DOCUMENTS  
(TERMS AND CONDITIONS)  
FOR  
SUPPLY, INSTALLATION AND COMMISSIONING OF LABORATORY EQUIPMENTS**

**PROCUREMENT OF GOODS  
THROUGH  
NATIONAL BIDDING**

**NIT No.: CAEPHT/Store/1/LE/14-15/400 dtd.07.06.2014**

**Date up to which Tender Forms will be obtained from the office of the Dean : from 11.06.2014 to 21.06.2014 (on all working days between 10.30 AM to 4.30 PM)**

**Last Date of submission of filled in Tender forms: 01.07.2014 upto 4:00PM**

**Date of Opening of Tender: 02.07.2014 at 11:00 AM**

- A.** Name of the Company/Firm: .....
- B.** Address for Correspondence: .....
- .....
- .....
- Telephone:.....Fax:.....
- Email:.....
- C.** Date of Application for Tender Document by the Bidder: .....
- D.** Date of Receipt of Application in Office: .....
- E.** Date of Issue of Tender Paper:.....
- F.** Date of Receipt of Tender Paper: .....
- G.** Tender fee deposited vide Draft no./Banker's cheque No:.....Dt.....
- H.** Earnest Money Deposited through
- Draft/Call Deposit/Bankers Cheque No:.....
- Dated:.....
- Amount: .....
- I.** Income Tax Clearance Certificate Enclosed: Y/N Certificate No:.....
- J.** CST/VAT Certificate Enclosed: Y/N Certificate No:.....

**OFFICE OF THE DEAN  
COLLEGE OF AGRICULTURAL ENGINEERING AND POST HARVEST TECHNOLOGY  
( CENTRAL AGRICULTURAL UNIVERSITY )  
RANIPOOL, GANGTOK – 737 135 (SIKKIM)**

Technical Specifications, Terms and Conditions and other details against this Office Notice Inviting Tender No. CAEPHT/Store/1/LE/14-15/400 dtd 07.06.2014 for the Supply of Laboratory equipment and installation.

**INTRODUCTIONS:**

1. The purchaser is the “*Dean, College of Agricultural Engineering & Post Harvest Technology*” hereinafter called “***The Purchaser***”.
2. The technical specifications, terms and conditions and other details mentioned in this document shall hereinafter be referred as the “***Tender Document***”.
3. The firm of the manufacturer or the dealer who is a prospective participant to this NIT shall hereinafter be referred as the “***Bidder***”.
4. Unless, otherwise stipulated the word “Quotation” and “Bid” shall have the same meaning.
5. Unless, otherwise stipulated the word “Quotationer” and “Bidder” shall have the same meaning.

**BID VALIDITY:**

6. The quotation submitted by the bidder shall be valid for a period of 90 (ninety) days. Bids not conforming to this provision may be treated as non-responsive and rejected.

**BID SECURITY (EARNEST MONEY):**

7. The bidder shall enclose a bid security amounting to 2% of the quoted price in the form of a Bank Draft/Bankers Cheque from a nationalized bank in favour of “Dean, CAEPHT” payable at Tadong. No Earnest money deposit will be accepted in the form of other receipts. The purchaser shall reject the Bids that are not accompanied by the aforesaid bid security. The bid security of the unsuccessful bidders will be released immediately after signing of the contract with the successful bidder and the bid security of the successful bidder will be released upon submission of the performance security pursuant to Para 32 below and upon signing the contract agreement as per format enclosed. The earnest money will be forfeited in the following cases:
  - i. When tenderer withdraws or modifies the offer after opening of tender but before acceptance of tender.
  - ii. When tenderer does not execute the agreement if any, prescribed within specified time.
  - iii. When the tenderer does not deposit the security money after the supply order is given.
  - iv. When he fails to commence the supply of the items as per supply order within the time prescribed.

**DELIVERY PERIOD:**

8. Delivery of the goods shall have to be completed strictly within 30 (thirty) days from the date of receipt of the notification of award of supplier. Quotations not conforming to this provision may be rejected at the discretion of the purchaser.

**PLACE OF DELIVERY AND INSTALLATION:**

9. The goods shall be delivered and duly installed, commissioned and demonstrated to the consignee at places indicated in the list of item.

**BIDDING PROCEDURE**

10. The bidder has to submit two bids i.e. Technical Bid and Commercial Bid for each items.
11. Both the Technical Bid and Commercial Bid shall be enclosed in separate envelopes with super scribed as "Technical Bid" or "Commercial Bid" on the respective envelopes.
12. Both the Technical and commercial bid envelopes shall be duly sealed in an envelope and super scribed at the top of the sealed cover "Tender for supply of Laboratory equipment" vide Tender Notification No CAEPHT/Store/1/LE/14-15/400 dtd. 07.06.2014
13. The technical bid will be opened first and will be evaluated. If the technical bid is upto the satisfaction of the purchaser then only the commercial bid of the firm would be opened. Commercial bids of only those firms who qualify in technical bidding will be considered. The date of opening of commercial bid shall be notified later.

**TECHNICAL BID**

14. The technical bid should contain detailed technical literature of all the items with all the details of technical specifications, make, model, literature, leaflets etc in support of the laboratory equipments quoted.
15. Attested copies of dealership certificate or manufacturing certificate with clear policy on warranty as follows and company price list must be enclosed with Technical bid. A Letter of undertaking/declaration (Annexure III) in this regard should be enclosed along with the Tender.
16. The firm must have at least three years experience of supply of equipment to the Government Departments/Institutions of repute and have satisfactory performance of the product supplied.
17. The bidder shall have to enclose the following documents with their technical bid.
  - i. List of customers with their address, items supplied during the last three years with supporting documents.
  - ii. Information about the nearest service setup, name of the contact person with address and phone number for the items.
18. The firm should be preferably an ISO 9001/2000 – 2001 certified or / and reputed brand.

**WARRANTY:**

19. Comprehensive On-Site Warranty shall be provided at the place of installation of the items.
20. The warranty of the items shall be as per the prevailing warranty policy/certificate of the manufacturer for the items and the warranty period shall not be less than twelve (12) months from the date of installing of the items at site. The bidder shall furnish the warranty certificate for all the items at the time of delivery and installing. The purchaser shall reject the items not enclosed by the warranty certificate from the manufacturer. The warranty certificate should be duly signed and sealed.
21. The supplier shall provide free maintenance services during the period of warranty. Any repair and maintenance including provision of spare parts (covered by the manufacturer's warranty certificate) during the warranty period shall be bidders responsibility.

22. The maximum response and defect restoration time should not be more than one week during the warranty period. In case the defect/malfunction of an item cannot be rectified within one week, the supplier will be required to arrange for immediate replacement of the same till it is repaired. On failure to arrange for immediate repair/replacement as mentioned above, there will be a penalty of Rs. 300.00 (Rupees three hundred) per day. The amount of penalty will be recovered from the performance security submitted by the supplier, if not paid by the supplier separately.
23. If the supplier having been notified fails to remedy the defects within one week, the purchaser reserves the right 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 contract.
24. Objection/reservation to the Para 19 – 24 above may lead to rejection of bids at the discretion of the purchaser.

**COMMERCIAL BID:**

25. To facilitate prompt evaluation, the bidder shall quote the price strictly as per the format enclosed herewith as Annexure II and failing which the bid may be treated as non-responsive, at the discretion of the purchaser.
26. There should not be any overwriting.
27. Bidders shall quote rates for all the items individually. Quotations from bidders quoting rates in lots may be rejected at the discretion of the purchaser.
28. Prices should be quoted inclusive of all charges like packing, forwarding, handling, freight and transportation, insurances etc. and should be shown separately.
29. CST/VAT/Entry tax of Sikkim and any other form of Tax should be mentioned clearly.
30. Rates should be quoted clearly both in words and figures separately for each item, without which the quotations shall stand rejected.
31. Rates should be quoted F.O.R College of Agricultural Engineering and Post Harvest Technology, Ranipool.
32. The prices quoted shall be fixed and firm and not subjected to adjustment/variation during the performance of the contract.
33. Up to date income tax and sale tax clearance certificate duly attested must be enclosed with commercial bid.

**BID OPENING AND EVALUATION:**

34. The Tender will be opened on **02.07.2014 at 11 AM in the office of the Dean, College of Agricultural Engineering and Post Harvest Technology, Ranipool – 737 135, Sikkim**. The bidder or his authorized representative may attend the bid opening.
35. In the event of the specified date for submission of bids declared a holiday for the purchaser, the bids will be received up to the appointed time on the next working day and will be opened at the appointed time and location on the same day.
36. The basis for evaluation shall be for the full quantity of all the items mentioned at Annexure – I. The bidders shall quote for all full quantity of an individual item, failing which; such bids may be treated as non-responsive at the discretion of the purchaser.
37. The purchaser will evaluate and compare the quotations determined to be substantially responsive i.e. which are
  - i. Duly signed
  - ii. Confirm to all the terms and conditions and Technical specifications.

- iii. Are enclosed by all the required documents, and
  - iv. Satisfy the qualification criteria.
38. The purchaser at his discretion may call for any clarification (s)/ documents from any or all the bidders during the process of evaluation of quotations.

**AWARD OF CONTRACT:**

39. The purchaser will award the contract prior to expiration of the bid validity period, to the bidder whose quotation bid has been determined to be substantially responsive and who has offered to evaluated quotation price.
40. The purchaser is not bound to accept the lowest rates quoted.

**PERFORMANCE SECURITY AND CONTRACT AGREEMENT:**

41. Within 7 (seven) days after receipt of the notification of award by the supplier, he shall have to furnish performance security equivalent to 5% of the contract value for due performance of the contract including provision of warranty for the items in supply order and which shall be valid for 2 (two) months beyond warranty period and less than 14 (fourteen) months from the date of supply of the items. If the successful bidder, upon receiving for notification of award, fails to furnish the performance Bank Guarantee within the stipulated time, the notification of award issued shall be withdrawn and cancelled.
42. Within 7 (seven) days from the date of receipt of the award of contract and upon submission of the performance guarantee, the successful bidder shall also sign an agreement with the purchaser for due performance of the contract as per the format enclosed herewith.

**PAYMENT:**

43. All payment shall be made in Indian Rupees only. However, for foreign equipments, the payment would be made in foreign currency through the Letter of Credit opened at our banker.
44. Payment by A/C payee Draft on State Bank of India shall be made after receipt of the items in good condition, installation and testing. Quotations having any other conditions for payment, viz. advance payment/payment through bank shall not be entertained.
45. Where-ever the laws and regulations require deduction of taxes at the source of payment, the purchaser shall effect such deduction from the payment due to the supplier, the remittance of amounts so deducted and issuance certificate for such deductions shall be made by the purchaser as per the laws and regulations in force.

**OTHERS:**

46. **Tenders shall be given only by manufacturer/authorized distributor/*bonafide* dealers of the goods.**
47. **One Agent can not represent two suppliers or quote on their behalf in a tender.**
48. If material is found defective and not as per specifications, the same shall be rejected straightway and in which case material will have to be lifted by the supplier/contractor at their own cost.
49. Every page of the original bidding document purchased from this office is to be signed by the bidder indicating their acceptance of terms and conditions and returned with their quotation.
50. The purchaser reserves the right to accept or reject any quotation and to cancel the instant bidding process and reject all quotations at any time prior to award of contract, without thereby incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidders of the grounds for the purchaser's action.

**Price Schedule Format**

Sl No	Name of Item (s)	Imp. Specification	Qty	Quoted unit rate (Rs)	Packing and Forwarding	CST/ VAT	Transportation	Any other	Total Amount (both in figure and words)

**Gross Total cost Rs.**\_\_\_\_\_

We agree to supply the above goods in accordance with the technical specification for a total contract price of Rs. .... (Amount in figure) (Rupees ..... (Amount in words) within the period specified in Invitation for Quotations.

We also confirm the normal commercial warranty / guaranty of ..... Months shall apply to the offered goods.

Signature of Supplier

**(On the Letter Head of the Tenderer)**

**LETTER OF UNDERTAKING/DECLARATION**

We, M/S..... hereinafter called as “Tenderer” complete address..... hereby declare in favour of The Dean, College of Agricultural Engineering and Post Harvest Technology, Ranipool, Hereinafter called as the “Tendering authority” and agree to abide by the following:

1. We have authorization certificate(s) as given below (Certificates valid till date are enclosed)

Sl. No.	Brand/Model Quoted	Authorization (Mention Y/N only)		
		Manufacturer	Dealer	Others, Pl. specify
1				
2				
3				

- 2. We will ensure that a minimum of 95% uptime, calculated on an annual basis is achieved for the supplied items.
- 3. We shall benefit of any price reduction found by the time of placing the supply order.
- 4. We agree to accept partial order if it is place.
- 5. We have quoted rates of items for 1 – year comprehensive onsite warranty.
- 6. The above document is executed on ...../...../200... at (place) and we accept that if anything out of the above information is found wrong, our tender shall be liable for rejection.

**Name of Person:**.....

**Complete Address:**.....



**BID FORM**

***(Letter Head of the bidder submitting quotation)***

No:.....

Date:.....

To,

The Dean  
College of Agril. Engg. & PHT  
Central Agricultural University  
Ranipool – 737 135.

Sir,

Having examined the Tender documents issued vide your office No..... including Addenda nos. (insert numbers if any), the receipt of which is hereby duly acknowledged, we, the undersigned, offer to supply and install ..... (name of item/s) specified therein in conformity with the said bidding documents for the sum or such other sums as may be ascertained in accordance with the Schedule of Prices attached herewith and made part of this bid.

We undertake, if our bid is accepted, to deliver the items in accordance with the delivery schedule specified.

If our bid is accepted, we will obtain the performance bank guarantee from a reputed Nationalized Commercial Bank within 7 (Seven) days of receipt of the notification of award in a sum equivalent to 5% (Five percent) of the contract price for the due performance of the contract.

We agree to abide by this bid for a period of 90 (ninety) days from the date fixed for bid opening as per the short NIT, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

We further agree to abide by all the terms and conditions of the bid documents.

Until a formal contract is prepared and executed, this bid together with your written acceptance thereof and your notification of award shall constitute a binding contract between us.

We undertake that, in competing for (and, if the award is made to us, in executing) the above contract, we will strictly observe the laws against fraud and corruption in force as per the "Prevention of Corrupt Act 1988."

We understand that you are not bound to accept the lowest or any bid you may receive.

Dated this..... day of ....., 200...

.....

(Signature)

(In the capacity of)

Duly authorized to sign bid for and on behalf of:

**CONTRACT FORM**

*(On Non Judicial Stamp of adequate amount)*

THIS AGREEMENT made the ..... day of ..... between *[Name of Purchaser]* of *[Address of Purchaser]* (hereinafter called "the purchaser") of the one part and *[name of supplier]* of *[address of supplier]* (hereinafter called "the supplier") of the other part.

WHEREAS the purchaser invited bids for certain goods and ancillary services viz., *[brief description of items and AMC if any]* and has accepted a bid by the supplier for the supply of those goods and services in the sum of *[contract price in words and figures]* (hereinafter called "the contract price").

**NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:**

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the conditions of contract referred to.
2. The following documents shall be deemed to form and be read and constructed as part of this Agreement, viz.
  - a) The bid form and the price schedule submitted by the bidder, together with all other documents submitted by the bidder in his bid or obtained subsequently by the purchaser before the date of award of contract.
  - b) The technical specifications, Terms and conditions and other details issued by the purchaser vide his NIT No..... And
  - c) The purchaser's notification of award
  - d) The bidder's acceptance letter against the purchaser's notification of award
  - e) The performance security submitted by the bidder
3. In consideration of the payments to be made by the purchaser to the supplier as hereinafter mentioned, the supplier hereby covenants with the purchaser to provide the goods and services and to remedy defects therein in conformity in all respects with the provisions of the Contract.
4. The purchaser hereby covenants to pay the suppliers in consideration of the provision of the goods and services and the remedying of defects therein, the contract price of such other sum as may become payable under the provisions of the contract at the times and in the manner prescribed by the contract.
5. Brief Description of Items and services.

Sl. No.	Description of Item to be supplied with Technical Specification	Quantity	Rate (Rs.)	Grand Total Amount (Rs)	CST
1	2	3	4	5	6
	Total				
Rupees (in words) total of col. T					
Seal and Signature of the Bidder					

IN WITNESS whereof the parties hereto have caused this agreement to be executed in accordance with their respective laws the day and year first above written.

Signed, sealed, delivered by ..... the .....(for the purchaser)

Signed, sealed, delivered by ..... the .....(for the supplier)

**PERFORMANCE SECURITY FORM (FOR BANK GUARANTEE ONLY)**

(FORMAT OF PERFORMANCE BANK GUARANTEE DURING THE CONTRACT, ON NON-JUDICIAL STAMP  
PAPER OF RS. 50/-)

To,

.....  
.....  
.....

WHEREAS [name of the supplier] (hereinafter called "the supplier") has undertaken in pursuance of Contract No. [reference number of the contract] dated..... 200... to supply [brief description of items] (hereinafter called "the Contract").

AND WHEREAS it has been stipulated by you in the said contract that the supplier shall furnish you with a bank guarantee by a reputed nationalized commercial Bank for the sum specified therein as security for compliance with the supplier's performance obligations in accordance with the contract.

AND WHEREAS we have agreed to give the supplier a guarantee:

THEREFORE WE hereby affirm that we are guarantors and responsible to you, on behalf of the supplier, up to a total of [amount of the guarantee in words and figures] being 5% of the total contract price and we undertake to pay you, upon your first written demand declaring the Supplier to be in default under contract and without cavil or argument, any sum or sums within the limits of [amount of guarantee] as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This guarantee is valid until the ..... Day of .....200...

Signature and seal of the Guarantors

\_\_\_\_\_  
(Name of Bank)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(Dated)

Note: Supplier should ensure that, seal and code no. of the signatory, put by the bankers, before submission of the bank guarantee.

### LIST OF EQUIPMENT FOR TENDER 2014

#### Detailed Specification of Mobile Pineapple Processing Unit

Sl. No.	Name of the Equipment	Specifications
1.	Pineapple Top and Tail Cutting Machine	<b>Capacity</b> : Minimum 6 pineapples/min, MOC: SS 304. Semi-automatic or manual
2.	Pineapple Skin Stripper	<b>Capacity</b> : minimum 6 pineapples/min. MOC: SS-304, Motor driven
3.	Semi-automatic Pineapple Corer and sizer with accessories	<b>Capacity</b> : minimum 6 pineapples/min. MOC: SS-304, Semi-automatic with a manual feeding.
4.	Pineapple Slicer	<b>Capacity</b> : minimum 6 pineapples/min. MOC: SS-304, Motor driven
5.	Pineapple Juicer	<b>Capacity</b> : minimum 6 pineapples/min. MOC: SS-304, Motor driven
6.	DG Set	<b>10 KVA</b> (silent, Kirloskar Green/under DGS&D Rate Contract or any other reputed make)
7.	Mobile Truck	Tata SFC-709 or similar size truck

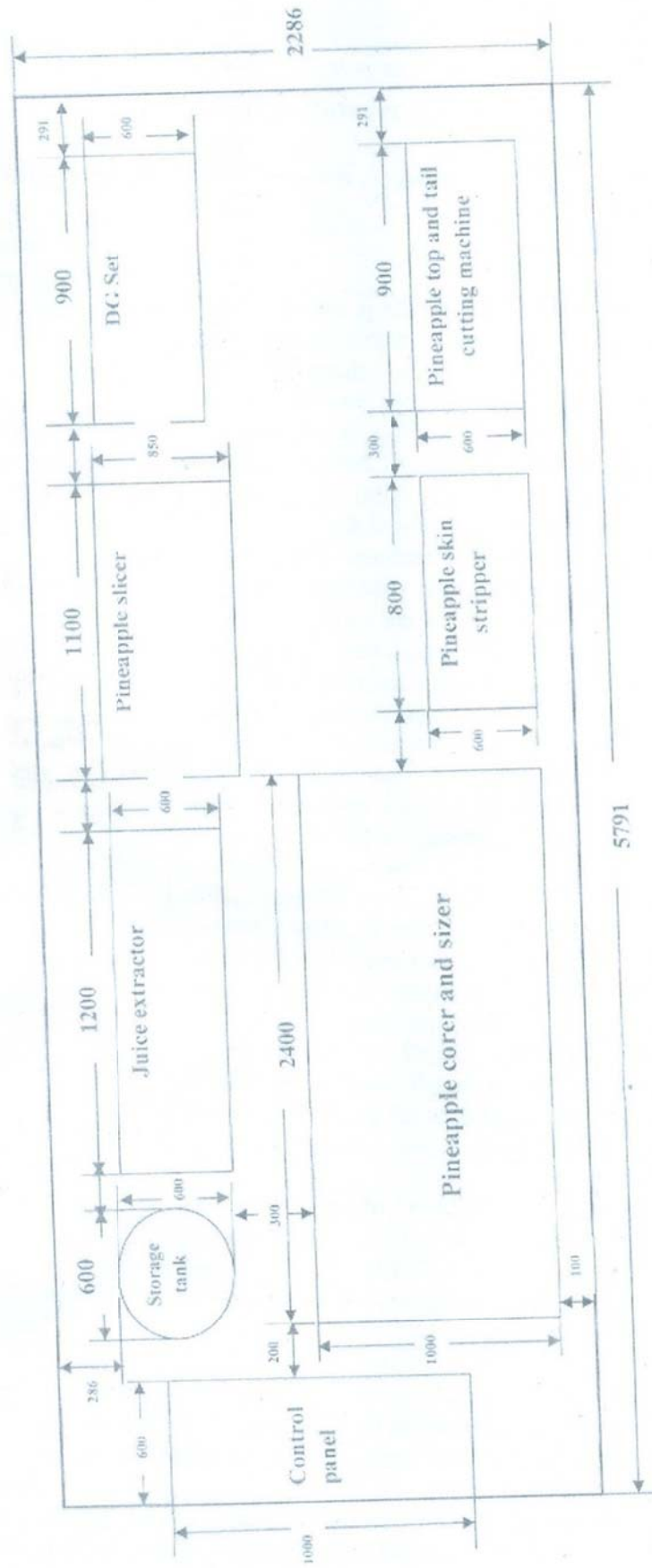
**Note:**

- a. The mobile processing unit should be complete with all the necessary pipings, fittings and accessories or spare parts required for installation of the unit
- b. The supplier has to install and demonstrate all the machineries on the mobile truck as per the desired layout.
- c. The complete layout, technical and operational manual of all machineries should be provided.
- d. There shall be a mandatory technical presentation of the prospective supplier/manufacturer at CAEPHT, Ranipool when asked for before final decision.
- e. The first time demonstration charge should be borne by the supplier.

Lay out of equipment on the chassis of the transport section unit is enclosed.

**F.O.R.** : Dean, College of Agriculture, Imphal (Manipur)/ Dean, College of Fisheries, Agartala (Tripura)/ Dean, College of Post Graduate Studies, Umiam, Barapani (Meghalaya).

## Desirable layout of mobile pineapple processing plant



All dimensions are in mm.

Truck size: 5791 mm X 2286 mm

## Pineapple Powder Processing Plant

### A. Multi-stage Evaporator with Aroma recovery System

Sl. No.	Name of the Equipment	Specifications
8.	Multi-stage Evaporator with Aroma recovery System	<p>The evaporator system is meant for Pineapple/Orange/Apple and other fruit juice concentrate and powder. All contact parts should be invariably made of SS-304/316. Feed rate: 100 kg per hour. Evaporation rate: 80 kg water per hour. It should consist of the following sections.</p> <p><b>Feeding Section:</b> The system should consist of balance tank with float operated valve, inline filter, Feed pump, graduated flow control valve, pre-heaters, high heater with temperature control system and valves.</p> <p><b>Evaporation Section:</b> Two-stage calandria type complete with necessary insulation and accessories. Vapour separator- 2 nos., complete with necessary attachments for visual inspection, temperature, and pressure measurement, and with matching accessories. Thermal vapour re-compressor with pressure gauge at the steam inlet. Surface type Condenser with vacuum gauge and necessary accessories. This section should also have vacuum pump and transfer pumps for concentrate &amp; condensate.</p> <p><b>Aroma recovery system:</b> It should consist of the following parts: packed bed stripper absorber, Three stage surface type, double pass condenser for aroma; Aroma collection unit, vacuum pump, and storage tank for chilled aroma.</p> <p>Control Panel and Instrumentation: Made of SS-304, dust and splash proof. It should also include flow diagram of the entire process. One set of temperature controller to control the high heating temperature and one set pressure controller to control steam pressure at the inlet of thermo-compressor. Digital type Temperature indicators with PT-100 sensors to indicate Pasteurizing/high heating temperature, Boiling temperatures in all the effects, temperature in the steam jacket of first calandria, cooling water in/out, product out for aroma recovery system.</p> <p><b>Utility Section:</b> it should consist of boiler, chillers, air compressors, and cooling tower of appropriate capacity in line and matching with the evaporator. All connection, piping, insulation would be the responsibility of the supplier/manufacturer.</p>

**Remarks:**

1. The supply should be complete with all accessories, piping and fittings.
2. It also should include the complete plant layout, flow diagrams, operating & technical manuals.
3. There shall be a mandatory technical presentation of the prospective supplier/manufacturer at CAEPHT, Ranipool when asked for before final decision.

**F.O.R. :** Dean, College of Agriculture, Imphal (Manipur)/ Dean, College of Fisheries, Agartala (Tripura)/ Dean, College of Post Graduate Studies, Umiam, Barapani (Meghalaya).

## B. Spray Dryer & Powder Packaging Unit

Sl. No.	Name of the Equipment	Specification
9.	Spray Dryer & Powder Packaging Unit	<p><b>Brief Specification:</b> Two Stage spray dryer for fruit juice, milk or any other liquid food with in-built fluidized bed dryer system and high pressure nozzle atomization system. Capacity: Feed Rate: 20 kg/h, 10 kg water evaporation, Powder Output: 10 Kg/h at 3-5% Moisture content, Feed Initial Solid: 50-60%, Drying Air Temp: 120-200 degree C, Drying air outlet temperature: 85-100 degree C. All necessary piping, fittings, joints and any accessories required for proper operation of the unit should be provided. The unit should be complete in all respects with necessary control and measurement systems and manual and diagrams with digital temperature indicator (PT-100), pressure and air flow measurement systems. It should also include temperature, pressure and flow alarm system in-built.</p> <p><b>Detail Specification:</b> The system should include the following:</p> <ol style="list-style-type: none"> <li><b>1. Air supply and distribution system:</b> It should consist of suitable supply air fan with flow rate control and filtration system, dehumidifier(made of SS 304), electrical air heater, SS 304 air duct, hot air distribution assembly (made of SS 304), exhaust air duct and blower.</li> <li><b>2. Drying Chamber:</b> SS 304/SS 316 cylindrical drying chamber with conical bottom, one set of door, one set of electro-magnetic hammers, outlet duct of SS, one sight and light glass assembly and a platform of SS at the top. The dryer is to be insulated and clad with SS- 304 sheet.</li> <li><b>3. Cyclone separator :</b> It should be made up of SS 304/SS 316 and connected to the dryer through SS 304 duct.</li> <li><b>4. Feed Supply and distribution system:</b> it should consist of SS 316 feed tank of suitable capacity matching with the concentration plant, duplex filter, feed pump assembly, SS feed pipe, and high pressure nozzle atomizer.</li> <li><b>5. Fine Powder recovery system:</b> the system should be complete with a fine powder collection chamber, fines return air filter and other suitable accessories.</li> <li><b>6. Fluidized Bed Dryer cum cooler:</b> It should consist of the following. <ul style="list-style-type: none"> <li><b>Dryer-cooler:</b> It should comprise of two compartments to distribute air for better fluidization. The bed should be of perforated sheet for drying and cooling of product in fluidized stage. Suitable arrangements (sight glass and drain</li> </ul> </li> </ol>

		<p>pipe) should be provide for inspection, viewing and drainage of wash water. A vibrator should be provided to produce vibrations during drying or cooling. It should also have a dehumidifier and exhaust air duct for the complete process.</p> <p><b>Powder collection system:</b> Suitable powder collection systems should be provided in the FBD for collection of powder.</p> <p><b>Form Filling and packaging System:</b> Matching form filling and packaging unit meant for fruit juice powder and milk powder. Form filling and packaging system should be made up of SS 304</p> <p><b>7. Control Panel:</b> The panel board should be complete with a flow Mimic diagram of the entire evaporator and spray drying plant on the front panel. The instrument panel should be prewired up to terminal connections and equipped with necessary instruments. Push buttons with indicating lamps for start/stop of all the motors in the spray drying plant.</p>
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**Note:**

- a. The unit should be complete with all the necessary pipings, fittings and accessories or spare parts required for installation of the unit.
- b. The complete layout, technical and operational manual of all machineries should be provided.
- c. There shall be a mandatory technical presentation of the prospective supplier/manufacturer at CAEPHT, Ranipool when asked for before final decision.
- d. The first time demonstration charge should be borne by the supplier.

**F.O.R. :** Dean, College of Agriculture, Imphal (Manipur)/ Dean, College of Fisheries, Agartala (Tripura)/ Dean, College of Post Graduate Studies, Umiam, Barapani (Meghalaya).



**DEPARTMENT OF SOIL AND WATER ENGINEERING**

Sl. No.	Name of the equipment	Specification
10.	<b>Pressure Plate and Pressure Membrane</b>	<p><b>Pressure Plate Extractor 15 Bar</b>  <b>Part No: LAB023V2,</b>                      The equipment consists of the following parts:                      1 Each 1600, 5 Bar Pressure Plate Extractor                      1 Each 1500 F1, 15 BAR Pressure Plate Extractor                      1 Each 0700CG23F1 MANIFOLD                      4 Each 0675B01 M3 1 BAR Pressure Plate Cells                      4 Each 0675B03M1 3 BAR Pressure Plate Cells                      4 Each 0675B05M1 5 BAR Pressure Plate Cells                      4 Each 0675B15M1 15 BAR Pressure Plate Cells                      1 Each 1080G1 PM HINGE WITH PLATE                      1 EACH 0775L60, CONNECTING HOSE FOR 1500 EXTRACTOR                      1 EACH 0776L60, CONNECTING HOSE FOR 1600 EXTRACTOR                      8 EACH 1093 SOIL SAMPLE RETAINING RINGS, PER DOZEN                      1EACH0505V2206 COMPRESSOR 220V                      (INCL. CONNECTION HOSE TO MANIFOLD AND COMPRESSOR )</p>

**DEPARTMENT OF BASIC SCIENCE AND HUMANITIES**

Sl. No.	Name of the Equipment	Specification
11.	<b><u>Interior set up/ management of the Laboratory</u></b>	<p>As per any modernized language/ communication skill development laboratory.</p> <p>Exact space/ area for the lab. will be mentioned during the time of placement of supply order.</p> <p>1.5 ton, split or as suit the room of the lab.</p>
	<ul style="list-style-type: none"> <li>i) Complete floor planning for language &amp; communication classes including carpeting of the floor.</li> <li>ii) Instructor's area decking</li> <li>iii) Group discussion table for four/six pupils</li> <li>iv) Storage rack</li> <li>v) Students' area decking</li> <li>vi) Back &amp; side treatment</li> <li>vii) False ceiling</li> <li>viii) Electrical work inside the laboratory</li> <li>ix) PVC mat at decking area.</li> <li>x) Room painting as per the need</li> <li>xi) Specially fabricated chairs for 25 users and one instructor.</li> <li>xii) Air conditioner</li> <li>xiii) Instructor's desk with electronic</li> </ul>	

	<p>console, digital interface.</p> <p>xiv) Audio equipment (sound system)</p> <p>xv) Fire extinguisher</p>	Ahuja/ any reputed company
12.	<b>Interactive Learning system (Software etc.)</b>	<p>i) Interactive Learning Software (integrated) System (ISIL),</p> <p>ii) ISILS Manager Complete switching unit i.e. one digital interface that controls upto 25 users.</p> <p>iii) User interface, each controls up to 8 users.</p> <p>iv) I/O device, audio control &amp; cable management unit.</p>
13.	<p><b><u>Multimedia Equipment &amp; set up for Mock GD/Interview/Presentation recording:</u></b></p> <p>i) Computer – Desktop &amp; Laptop for (ISIL System/operation)</p> <p>ii) UPS</p> <p>iii) Wireless and wired Microphones</p> <p>iv) Headset i.e. Headphone with Microphone (wireless)</p> <p>v) Handycam with accessories</p> <p>vi) Memory stick</p> <p>vii) Video dumping and editing card.</p> <p>viii) LCD Projector with Wall Hanging mounting kit</p> <p>ix) Wall mounted Projection screen</p> <p>x) Collar microphone</p>	<p>HP, 3.00 GHz, Intel –i5 (3<sup>rd</sup> Gen) processor / 4 GB RAM/ 500GB HDD/DVD Multy RW/ 17” TFT monitor, WIN 8 with Quick Heal Antivirus preloaded.</p> <p>1000 VA APC make UPS BR 1000 VGA Multiplier</p> <p>AHUJA / any reputed company. Altec Lansing / Similar brand. Sony 16 GB HD Camcorder/Similar quality with remote control tripod, one zoom microphone &amp; wide conversion lens 16 GB</p> <p>SONY/ any reputed brand. LCD Multimedia projector Model No. NEC/VT-700G 2500 to 6000 ANSI; Lumens with media card imager adapter. Resolution 1024x768xGA, ANSI, Lumens : 3000/Similar make</p> <p>Ahuja/ Similar make</p>
14.	<b>ID Card Printer</b>	<p><b>General :</b> Full color double sided card printer with LCD display, Windows® drivers, Bi-directional driver communication, Card Design Software with standard features, Cost of Accessories such as cost per 500 cards, Colour and monochrome ribbon cost may be specified.</p>

		<p>Include the detail specification with brochure of the product quoted.</p> <p><b>Printing:</b> Color dye sublimation or monochrome thermal transfer printing, more than 100 cards per hour full color single-sided(YMCKO, minimum 300 dpi print resolution</p> <p><b>Card Specifications:</b> Types: PVC, Composite, Adhesive backed, Card width/length: ISO CR-80-ISO 7810, 2.12"/54mm x 3.38"/86 mm; Card thickness: 10 mil(.25 mm) to 60 mil (1.524 mm) (+/-10%); Card feeder capacity: 100 cards(30mil) or 220 cards(30 mil), Card output hopper capacity: 100 cards (30 mil)</p> <p><b>Communications Interface:</b> USB 1.1 (USB 2.0 compatible) cable included; Optional Built-in 10/100 <b>Ethernet:</b> 100~240 Volts AC, 50~60 Hz (auto switching)</p> <p>Card Design Software with standard features, Cost of Accessories such as cost per 500 cards, Colour and monochrome ribbon cost may be specified.</p>
15.	Workstation	<p>L-shaped wall attached work station (LBH) (510-570)cmx (90-105)cmx(90-105)cm; (480-540) cm x (90-105)cm x (90-105)cm</p> <ul style="list-style-type: none"> <li>• Storage unit with camlock: 900±1mm depth and 900±1mmHt with metal shutters and drawers (11)</li> <li>• Cover panel (3)</li> <li>• One sided reagent shelf (Two tier) : 300±1mm Depth, 660±1mm Ht and 1200±1mm L with two cutouts for six module plate (4)</li> <li>• Stainless steel sink (520 x 440 x 200)±3mm and accessories (2)</li> <li>• Water Faucets: 3 way brass water faucets (2)</li> <li>• Necessary blower ductings and utility lines like electrical wirings/fittings, gas line-tubing, water lines etc. should be provided.</li> </ul> <p>Granite Work surface (20 ±2 mm thick), edge moulding, V-Groove, Sink cut, Column cut , Neoprene mat</p> <p>Work station both sides (LBH) (240-300) cm x (120-180) cm x (60-120) cm along with</p> <ul style="list-style-type: none"> <li>• Storage unit with camlock: 750±1mm Depth and 900±1mmHtwith metal shutters and</li> </ul>

		<p>drawers (15)</p> <ul style="list-style-type: none"> <li>• Cover panel :end side panel 600±1mm D, 900±1mm H (3)</li> <li>• Double sided reagent shelf (two tier) 300±1mm Depth, 660±1mm Ht and 1200±1mm L with two cutouts for six module plate (4)</li> <li>• Stainless steel sink (520 x 440 x 200)±3mm and accessories (8)</li> <li>• Water Faucets: 3 way brass water faucets (8)</li> <li>• Necessary blower ductings and utility lines like electrical wirings/fittings, gas line-tubing, water lines etc. should be provided.</li> </ul> <p>Granite Work surface (20 ±2 mm thick), edge moulding, V-Groove, Sink cut, Column cut, Neoprene mat</p> <p>Accessories for workstations (seating arrangements) etc.  Revolving stool high base with height adjustment  Lowest position: 67 ± 5 cm Highest position: 78 ± 5cm  Cushion Seat : 25-35cm (Dia), 2.5-5cm(H)</p>
16.	<b>Spectrophotometer (UV-VIS digital)</b>	<p>Type: UV-VIS, Double-beam optics  Sample compartment ; Internal dimensions: W150 × D260 × H140 (mm)  Maximum optical path length of cell : 100 mm  Light source : 50 W halogen lamp, deuterium lamp, light source :auto position adjustment built  Wavelength range : 185 - 1400nm  Wavelength accuracy : ±0.1 nm (656.1 nm D2), ±0.3 nm (all range)  Wavelength setting : At 1 nm units for scan start and scan end  Spectral bandwidth ; 0.1/0.2/0.5/1/2/5 nm ;L2/L5 (low stray-light mode)  Photometric modes Absorbance (Abs.), transmittance ;(%), reflectance (%), energy (E)  Photometric range: Absorbance: -5 to 5 Abs Transmittance,  Noise level : 0.00003Abs RMS (500nm)  Baseline flatness : ±0.0003Abs (200~860nm), 1 hour after light source is turned ON  Baseline stability : Within 0.0002 Abs/h (700 nm), 1 hour after light source is turned ON</p>

		Accessories: Branded PC with software and printer, Quartz Cuvettes of different volumes (1-1.5mL; 3.3.5mL; 4-5mL - 4 numbers each)
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### PHYSICS/ELECTRICAL/ELECTRONICS LAB

Sl.No	Equipment	specification
17.	Electron spin resonance (ESR) apparatus RF probe, Base unit, ESR adaptor	Set up should contain : RF probe, ESR adaptor ,DIGITAL STORAGE OSCILLOSCOPE , preferably COMPUTER assisted, along with Proper manual
18.	Operation and safety electronics trainer for electrical circuitry.	Standard laboratory model
19.	Power supply (AC/DC) programmable (02 Nos.)	<p>AC power supply</p> <ul style="list-style-type: none"> <li>• Source and sink (programmable load) 100fA to 100mA</li> <li>• <math>10^{14}\Omega</math> output impedance ensures stable current sourcing into variable loads</li> <li>• Built-in RS-232, GPIB, Trigger Link,</li> <li>• Reconfigurable output</li> <li>• Source AC currents from 2pA to 100mA for AC.</li> <li>• Built-in standard and arbitrary waveform generators with 1mHz to 100kHz frequency range.</li> <li>• programmable load or sensor signal and for noise emulation</li> <li>• Programmable pulse widths as short as 5 micro s, limiting power dissipation in delicate components. Supports pulsed I-V measurements down to 50µs when used with Nanovoltmeter</li> <li>• Built-in Ethernet interface for easy remote control without a GPIB controller card</li> </ul> <p>DC power supply</p> <p>Dual output models with two 30V/1.5A (45W) channels</p> <ul style="list-style-type: none"> <li>☐ All channels are independently controlled and isolated outputs</li> <li>☐ All channels have remote sensing to ensure that programmed voltage is accurately applied to the load</li> <li>☐ Two 30V channels can be combined either in series to double output voltage or in parallel to double output current</li> <li>☐ 0.3% basic voltage output accuracy and 0.1% current</li> </ul>

		<p>accuracy ensure quality test data</p> <ul style="list-style-type: none"> <li>☐ Low noise, linear regulation with &lt;3mVpp ripple and noise</li> <li>☐ Voltage and current outputs for all channels</li> <li>☐ Keypad entry</li> <li>☐ USB and GPIB interfaces</li> </ul>
20.	Apparatus to study characteristics of MOSFET, SCR and TRIAC	<p><b>A. MOSFET Trainer :</b> <i>Set up should contain</i> The trainer consists of</p> <ul style="list-style-type: none"> <li>i) dual channel variable power supplies 0 – 15 V &amp; 0 – 5 V . Dual mode power supply</li> <li>ii) Two Digital Voltmeters &amp; one Digital Ammeter.</li> <li>iii) Components on board.</li> </ul> <p><b>B. SCR Trainer.</b> trainer consists of :</p> <ul style="list-style-type: none"> <li>i) Dual channel variable power supplies: 0 – 130 V @ 500 mA &amp; 0 – 15 V @ 100 mA. Dual mode power supply</li> <li>ii) Two Digital Voltmeter &amp; one Digital Ammeter.</li> <li>iii) Components on board.</li> </ul> <p><b>C. Diac &amp; Triac Trainer.</b> The trainer consists of:</p> <ul style="list-style-type: none"> <li>i) Dual channel variable power supplies: 0 – 130 V @ 500 mA &amp; 0 – 15 V @ 100 mA. Dual mode power supply</li> <li>ii) Two Digital Voltmeter &amp; one Digital Ammeter.</li> <li>iii) Components on board.</li> </ul> <p>along with Proper manual</p>
21.	Apparatus to study RS, D & JK flip flops and 7-segment display & BCD 7-segment decoder (02 NOs)	<p><b>A. Flip – Flop Trainer.</b> <i>Set up should contain</i> The single board trainer with in – built I.C. regulated +5 V @ 500 mA power supply , Logic input &amp; Output indicators helps to testing , verificaton and study the function of basic sequential circuit independently</p> <ul style="list-style-type: none"> <li>i) S – R Flip-Flop</li> <li>ii) J – K Flip- Flop</li> <li>iii) T Flip – Flop</li> <li>iv) D Flip – Flop</li> </ul> <p><b>B. Seven Segment Display Trainer.</b> The single board trainer helps to studies the seven segment display operation using Decoder . The trainer contains</p> <ul style="list-style-type: none"> <li>(a) + 5 V @ 500 mA regulated power supply</li> <li>(b) 4 nos. Logic inputs</li> <li>(c) Seven Segment Display</li> <li>(d) Decoder</li> </ul> <p>along with Proper manual</p>
22.	Application of photo cell in electrical circuitry	<p><i>Set up should contain</i> The single board trainer with in built I.C. regulated + 12V Power supply , fire alarm circuit using Transistors , Relay ,</p>

		<p>buzzer and switches , LDR used as sensor and its illuminated by LED fitted in a metal casing . In presence of fire , smoke produce and its interrupt the light beam . The transistorized alarm system on and acknowledge and reset by a push switch .</p> <p>along with Proper manual</p>
23.	Computer-micro controller kit (02 Nos)	<p><b>A. Microcontroller Kit .</b>  <b>With computer /LAPTOP</b>  <b>CPU</b> 8031 / 8051 operating at 11.0592 MHz  <b>MEMORY</b> EPROM1 32KB bytes with monitor software  EPROM2 Optional – 32KB ROM RAM1 32 KB Data RAM  RAM2 32 KB program/Data RAM  <b>I/O PARALLEL</b> 48 I/O lines using two 8255 <b>I/O SERIAL</b>  <b>One RS232 compatible interface</b>  <b>TIMER</b> <b>KEYBOARD</b> Consisting of 28 numbers of computer grade keys  <b>DISPLAY</b> Six numbers of seven segment displays  <b>BUS SIGNALS</b> I bus signals are terminated in berg stick.  Controller specific lines like port 1 lines TO T1, INTO, INT1, etc. are terminated in a burg stick header  <b>MONITOR SOFTWARE</b>  keyboard and serial modes  along with Proper manual</p>
24.	Trainer kit to study logic gates and counters (02 Nos.)	<p>The single board trainer with in-built I.C. regulated +5 V @ 500 mA power supply , a bread board , Logic input &amp; output indicators . TTL I.Cs helps to study the</p> <ol style="list-style-type: none"> <li>i) Verification of Truth Table AND,OR,NOT,NAND , XOR Gate.</li> <li>ii) Simple circuit design with AND,OR, NOT, NAND, XOR Gate.</li> <li>iii) Design Logic circuit from logic expression by using only NAND &amp; NOR Gates.</li> <li>iv) Design a logic circuit from Truth Table using Karnaugh map.</li> </ol> <p><b>Asynchronous Counter Trainer</b>  along with Proper manual</p>

### AICRP on Renewable Energy Sources (RES)

Sl. No.	Name of Item	Purpose and Specification
25.	Instant Digital Wood Moisture Meter	<p><b>Purpose:</b> Digital measurement of moisture content of woody biomass materials.</p> <p><b>Specification:</b>  Type: Portable type  Moisture measurement range: 0–50%  Power: Battery operated/or rechargeable battery  Resolution: 1.0% (or 0.1%)  Accuracy: 0.2–0.5%</p>

		<p>Operational temperature: 0–50 °C  Humidity range: 0–80%  Display: Digital LCD/LED type  Data option: Hold and should have provision to connect with data logger  Probe: Impact pin/ other, with probe shield  Data display: % moisture, time (optional), and temperature  Optional: Data print facility  Warranty: Minimum 1 year on site.</p>
26.	Biogas Analyzer/ System Monitor with all accessories	<p><b>Purpose:</b> Measurement of methane, carbon dioxide, oxygen, hydrogen sulphide and carbon monoxide contents in gas.  <b>Specification:</b>  Handling type: Portable in nature  Sensor range:  Methane: 0–100% (v/v) with 0.1 or 1.0% resolution  Carbon dioxide: 0–100% (v/v) with 0.1 or 1.0% resolution  Oxygen: 0–25% (v/v) with 0.1 or 1.0% resolution  Hydrogen sulphide: 10–20000 ppm with 1 ppm resolution  Carbon monoxide: 0–50% (v/v) with 0.1 or 1.0% resolution (optional)  Display: Digital LCD/LED  Data storage facility: Should have provision of inbuilt data logger  Power: Battery operated; Rechargeable facility with 220 V, AC input  Warranty: Minimum 1 year on site.</p>
27.	Biomass Combustor cum Hot Air Generator	<p><b>Purpose:</b> Biomass combustor cum hot air generator with drying chamber, thermally insulated with inbuilt ash collection provision for drying of high value products and scientific study.  <b>Specification:</b>  Fuel suitability: Wood, wood chips, pallets up to 50 mm size, briquette (charcoal/biomass) having moisture content range of 6–10% (wet basis)  Primary and secondary air for flue gas temperature range of 200–270 °C for heating application.  Fuel burning rate: 3–5 kg/hour  Air flow rate: 600–1000 m<sup>3</sup>/hour  Flue gas heat exchanger facility should be inbuilt  Outlet hot air temperature: 80–200 °C  Control: Digital control facility for temperature and air flow rates  Optional: Add on external/internal combustion unit as per the requirement  Drying Chamber: Tray type suitable for drying of high value crop/ spices/ vegetables and others @ 10–20 kg/h capacity  Optional Accessories: Instruments for scientific data recording,</p>



		portable data print/ logger/ processor (Windows – 7) for temperature/ humidity. Warranty: Minimum 1 year on site.
28.	Hot Air Oven	<p><b>Purpose:</b> Hot air oven for scientific/ laboratory study application.</p> <p><b>Specification:</b>  Supply Power: Single phase, 220 V AC  Power rating: 1000–3000 Watt  Inside size of chamber: 455 mm × 455 mm × 605 mm or larger size  Temperature range: Controlled between 5° above ambient to ambient to 250° C with accuracy of ± 1° C  Display and Controller: Digital display and should have PID temperature controller having resolution of 1 °C, heating rate: 5–10 °C/minute  Timer facility: Timer setting provision (optional).  Warranty: Minimum 1 year on site.</p>
29.	Gas Chromatograph	<p><b>Purpose:</b> Gas chromatographical analysis of anaerobic digester and combustion gases (CH<sub>4</sub>, CO, CO<sub>2</sub>, O<sub>2</sub>, H<sub>2</sub>, and H<sub>2</sub>S), required for conducting researches.</p> <p><b>Specification:</b>  The equipment should be of high quality (branded/ reputed make), with complete peripherals/accessories (Laptop/ Computer with analysis software for Windows – 7 or 8, Printer, Carrier gas cylinder and its attachments; and GC packed columns, i.e., Porapak Q, Molecular Sieve (MS), OV- 1.</p> <p>Microprocessor based modular GC system with Dual Packed Column Injection Port with Dual Flow Line Advance Flow Controller (AFC) and high sensitivity Single FID &amp; TCD Detector system for operation on 220V / 50Hz.</p> <p>Fast column oven cooling with microprocessor rear vent control.</p> <p>Dual packed column injection port with dual flow line Advanced Flow Controller (AFC) for digital setting and control of carrier gas flow up to 100 mL/min.</p> <p>Capability of installing 2 packed columns either SS or Glass, 1/8" OD.</p> <p>Dual Flow Rate Differential Thermal Conductivity Detector System with temperature range up to 400 °C.</p> <p>TCD dynamic range of 10<sup>5</sup> with sensitivity of 40,000 V.mL/mg.</p> <p>Large interactive Graphical User Interface (GUI) LCD display for easy setting of GC parameters and monitoring functions including chromatograms.</p> <p>Intelligent self-diagnostics functions validate the instrument</p>

		before every sample injection.  Warranty: The equipment should have a minimum guarantee for 12 months from the date of installation.
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**Note :- For the items at serial number 10- 29 should be supplied at F.O.R. Dean, College of Agricultural Engineering & Post Harvest Technology, Ranipool-737135, Sikkim.**