



THAMIRABHARANI ENGINEERING COLLEGE

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

Chathirampudukulam, Chidambaranagar - Vepemkulam Road

Thatchanallur, Tirunelveli 627 358, Tamil Nadu.

6.1.2 DECENTRALIZATION AND PARTICIPATIVE MANAGEMENT

CASE STUDY

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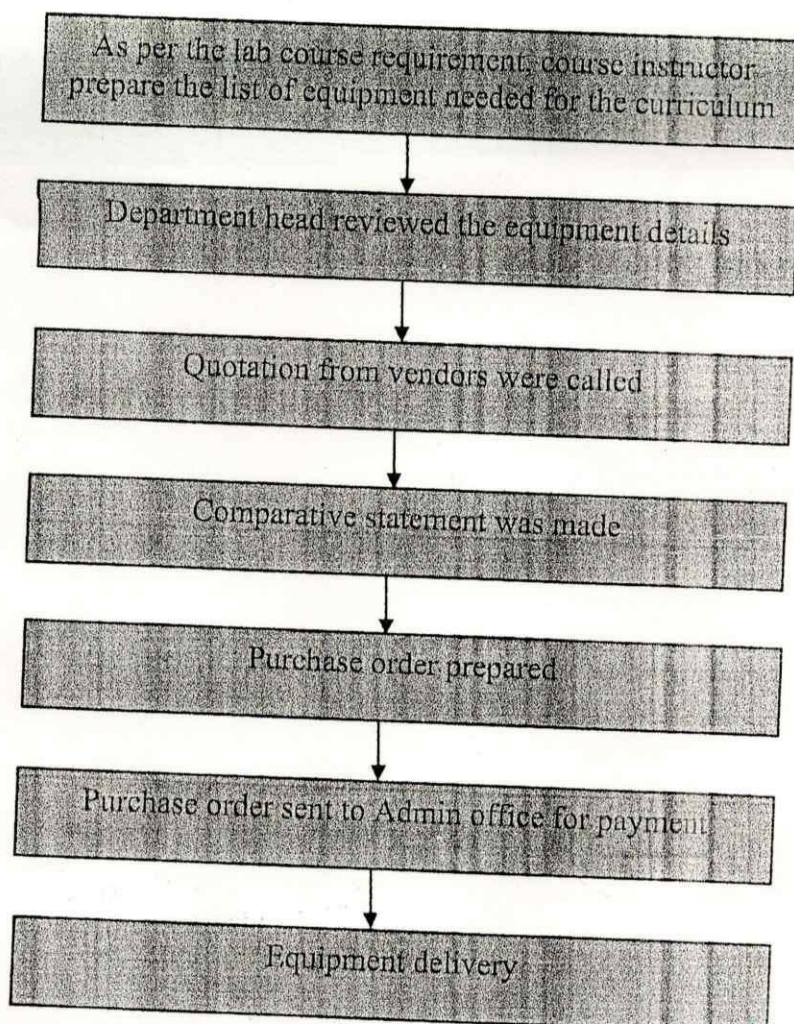
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Chathirampudukulam, Chidambaranagar - Vepemkulam Road
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Case study of capital equipment purchase demonstrating decentralization and participative management

Type of purchase: Major equipment for the lab course

Reason for purchase: For Curriculum requirement



dh
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Thatchanallur, Tirunelveli - 627 358.

From,

S. Sundararaj

HOD i/c

Department of EEE

Thamirabharani Engineering College,

Tirunelveli

To,

The Principal

Thamirabharani Engineering College,

Tirunelveli.

Sub: Requesting for EE8712 - Renewable Energy Lab
Purchase.

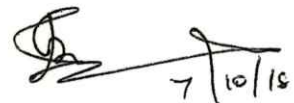
Respected Sir,

I am writing this letter to make a request for purchasing EE8712 Renewable Energy Lab equipment for our department and herewith I attached the syllabus of EE8712 Renewable Energy Systems Lab

Thanking you

Yours sincerely

TEC


7/10/18


1/10/18


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OBJECTIVES:

- To train the students in Renewable Energy Sources and technologies.
- To provide adequate inputs on a variety of issues in harnessing Renewable Energy.
- To recognize current and possible future role of Renewable energy sources.

LIST OF EXPERIMENTS

- 1 Simulation study on Solar PV Energy System.
- 2 Experiment on "VI-Characteristics and Efficiency of 1kWp Solar PV System".
- 3 Experiment on "Shadowing effect & diode based solution in 1kWp Solar PV System".
- 4 Experiment on Performance assessment of Grid connected and Standalone 1kWp Solar Power System.
- 5 Simulation study on Wind Energy Generator.
- 6 Experiment on Performance assessment of micro Wind Energy Generator.
- 7 Simulation study on Hybrid (Solar-Wind) Power System.
- 8 Experiment on Performance Assessment of Hybrid (Solar-Wind) Power System.
- 9 Simulation study on Hydel Power.
- 10 Experiment on Performance Assessment of 100W Fuel Cell.
- 11 Simulation study on Intelligent Controllers for Hybrid Systems.

TOTAL: 60 PERIODS**OUTCOMES:**

- Ability to understand and analyze Renewable energy systems.
- Ability to train the students in Renewable Energy Sources and technologies.
- Ability to provide adequate inputs on a variety of issues in harnessing Renewable Energy.
- Ability to simulate the various Renewable energy sources.
- Ability to recognize current and possible future role of Renewable energy sources.
- Ability to understand basics of Intelligent Controllers

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

S.No	Name of the equipments / Components	Quantity Required	Remarks
1.	Personal computers (Intel i3, 80GB, 2GBRAM)	15	-
2.	CRO	9	30MHz
3.	Digital Multimeter	10	Digital
4.	PV panels - 100W, 24V	1	
5.	Battery storage system with charge and discharge control 40Ah	1	
6.	PV Emulator	1	
7.	Micro Wind Energy Generator module	1	
Consumabilitys (Minimum of 5 Nos. each)			
8	Potentiometer	5	-
9	Step-down transformer	5	230V/12-0-12V
10	Component data sheets to be provided		


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Mega Tech SCIENTIFIC INSTRUMENTS

Door No. 9, Gandhi Nagar, 1st Cross, Kattabomman Street,
Ganapathy, Coimbatore – 641 006.

Cell: 98422 85000, 85086 85000 Phone: 0422 – 4212226

E-mail: megascientific@gmail.com

MTECH /RES-LAB/255/2019-20.

29.01.2020

To

The Principal,

Thamirabharani Engineering
Chidambaranagar Vepemkulam Road

College Chathirampudukulam Village,
Thatchanallur, Tirunelveli District – 627358

Kind Attn.: The HOD of EEE Dept.,

Dear Sir,

SUB: Quotation for Renewable Energy Sy

REF: Anna University 2017 Regulation – E

ms Lab. Reg.,

- EE8712- Renewable Energy Systems Lab.

With great pleasure we announce that, we have developed a cost effective and technically strong products based on the latest available Technology for Renewable Energy Systems Lab. The products we deliver is a blend of our Technical experience with affordable price.

We have enclosed the entire range of products catalogue, which will give you an idea of the product but it may not answer your specific questions, for which we are ready. If you require any further details, technical/otherwise please do feel free to contact us.

We are sure you will find our offer most competitive and looking forward to receive a positive reply and your valuable purchase orders at the earliest.

Thanking you in anticipation and assuring you the closest co-operation at all times.

For Megatech Scientific Instruments,

V. Ranganathan



Cell: 98422 85000, 85086 85000

M. R.

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Chidambaranagar - Vepemkulam Road.
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Complete Package for 2017 Regulation – EEE – EE8712- Renewable Energy Systems Lab.

QUOTATION: 01

Sl.No	Description	Qty	Rate / Unit	Amount
1.	<p>MTECH –SPA 4020</p> <p>Solar PV - IV Characteristics, Shadowing Effect & Protection Methods Trainer System.</p> <ul style="list-style-type: none"> Experiment on “IV-Characteristics and Efficiency of 1kWp Solar PV System”. Experiment on “Shadowing effect & diode based solution in 1kWp Solar PV System”. 	1 No	35,000.00	35,000.00
2.	<p>MTECH - MEGA 3200</p> <p>Universal Solar PV Based Solar Off Grid and Hybrid power system trainer system.</p> <p>1 KW OFF – GRID AND HYBRID Inverter System With 100 Watt /12 Volts Solar PV Panel with MPPT charge Controller 20 Amps and 12 V / 40 AH Battery and metering and solar emulator lighting setup arrangements.</p> <ul style="list-style-type: none"> Experiment on “Performance assessment of Grid-connected and Standalone 1kWp Solar Power System”. Experiment on “Performance Assessment of Hybrid (Solar-Wind) Power System”. 	1 Set	90,000.00	90,000.00
3.	<p>MTECH Model: WIN -1100</p> <p>Wind Emulator based Wind Energy Alternator coupled system with External programmable wind profile.</p> <p>500 Watt, Wind Emulator based Micro Wind Energy Generator with single phase alternator coupled to a VFD based 3 phase Motor system for speed control to Emulate wind speed.</p> <p>Rating : 12 Volts / 24 volts @ 24 Amps (AC to DC)</p> <ul style="list-style-type: none"> Experiment on Performance assessment of micro Wind Energy Generator. 	1 No	90,000.00	90,000.00
4.	<p>MTECH – Model: ONG 1000</p> <p>1 Kw – ON- GRID Connected power system and String Inverter trainer system with 1KW Solar panel.</p> <p>Solar PV Panel 320 Watt , Solar PV Panel 320Watts * 3 No’s @ 1 KW system. With stand and mechanical fixers. Model : 320 Watts , 24 Volts Voc (45.92 Volts) Size : 1961 mm*991mm*40mm Warranty: 25 Years PW.</p> <ul style="list-style-type: none"> Experiment on Performance assessment of Grid connected and Standalone-1kWp Solar Power System. 	1 Set	1,45,000.00	1,45,000.00



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Chathirampudukulam

Chidambaram

Thalcheruvu, Tirunelveli - 627 500.

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E-mail: megascientific@gmail.com

5.	MTECH - Model : PVE 8500 Digital Stand Alone and PC based PV Emulator for study and lab application using software. DC : 0 – 50 Volts @ 0 – 20 Amps <ul style="list-style-type: none">Experiment on Performance assessment of Grid-connected and Standalone 1kWp Solar Power System.	1 No	40,000.00	40,000.00
			TOTAL	4,00,000.00
			GST @ 5 %	20,000.00
			TOTAL	4,20,000.00

Simulation Experiments can be done using Matlab –Simulink, LABVIEW as per your requirements.

TERMS & CONDITIONS:

- TAXES** : **GST @ 5% will be charged extra as shown in our offer.**
- Payment** : **60% Advance** along with your purchase order and Balance against delivery.
- Delivery Charges** : At your place free of freight charges.
- Validity** : 90 days from date.
- Warranty** : 1 Year against any manufacturing defects.
- Delivery Period** : 2 – 3 Weeks from the date of your order.

Thanking you in anticipation,

Yours truly,

For *Mega Tech Scientific Instruments,*



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E-mail: megascientific@gmail.com

QUOTATION -02 FOR FUEL CELL TRAINER SYSTEMS

Sl.No	Description	Qty	Rate / Unit	Amount																								
1	<p>MTECH - Model FC 5A 18 Watt Stand-alone model. (No Extra arrangements needed complete demo model)</p> <p>Fuel Cell Trainer System. Operating temperature : 65 degree C Pressure : Ambient Gas : Hydrogen/Oxygen Humidification temp : 65/75°C for hydrogen and 70/75°C for oxygen Flow rate for hydrogen : 450cc at Maximum current Flow rate of oxygen : 300 cc at maximum current Power : 9 watts @ 0.7V and 18 watts @ 0.6V</p>	1No	75,000.00	75,000.00																								
2	<p>MTECH – Model FC 100 W</p> <p>Fuel Cell Training System 104 Watts, 32 Amps complete system as per standards.</p> <p>Extra Accessories: Hydrogen cylinder with Dual regulator</p> <table border="1"> <tr> <td>Active area of each cell in cm²</td> <td>50cm2</td> </tr> <tr> <td>No. of cells</td> <td>5 cell</td> </tr> <tr> <td>Total Active area in cm²</td> <td>250 cm2</td> </tr> <tr> <td>Active area size of each cell (Width and Height)</td> <td></td> </tr> <tr> <td>Power out put</td> <td>32A @ 0.65V, 104 watts</td> </tr> <tr> <td>Type of flow field design</td> <td>Serpentine flow for anode and cathode</td> </tr> <tr> <td>Channel Height and Width</td> <td>1mm and 1mm</td> </tr> <tr> <td>Rib width</td> <td>1mm</td> </tr> <tr> <td>Graphite plate size (Width, Height, Thickness)</td> <td>75x150x4mm</td> </tr> <tr> <td>Type of GDE (Details of Pt/C)</td> <td>40%Pt/C</td> </tr> <tr> <td>GDE size (Width, Height, Thickness)</td> <td>5x10cm</td> </tr> <tr> <td>Type of membrane</td> <td>Nafion 212</td> </tr> </table>	Active area of each cell in cm ²	50cm2	No. of cells	5 cell	Total Active area in cm ²	250 cm2	Active area size of each cell (Width and Height)		Power out put	32A @ 0.65V, 104 watts	Type of flow field design	Serpentine flow for anode and cathode	Channel Height and Width	1mm and 1mm	Rib width	1mm	Graphite plate size (Width, Height, Thickness)	75x150x4mm	Type of GDE (Details of Pt/C)	40%Pt/C	GDE size (Width, Height, Thickness)	5x10cm	Type of membrane	Nafion 212	<p>1 No</p> <p>1 set</p>	<p>4,00,000.00</p> <p>29,500.00</p>	<p>4,00,000.00</p> <p>29,500.00</p>
Active area of each cell in cm ²	50cm2																											
No. of cells	5 cell																											
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Type of GDE (Details of Pt/C)	40%Pt/C																											
GDE size (Width, Height, Thickness)	5x10cm																											
Type of membrane	Nafion 212																											

[Handwritten Signature]
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Chidambanagar - Nerpunkulam Road
Tiruchanattur, Tirunelveli - 627 358

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Ganapathy, Coimbatore – 641 006.

Cell: 98422 85000, 85086 85000 Phone: 0422 – 4212226

E-mail: megascientific@gmail.com

Membrane size (Width, Height, Thickness)
Current collector material
Current collector size (Width, Height, Thickness)
Supporting End plate material
Supporting End plate size (Width, Height, Thickness)
Gasket material
Insulator material

75x150mm			
Copper			
150x120x2mm			
Al alloy			
~ 200x105x12.5mm			
Teflon coated fiber glass			
Teflon coated fiber glass			

1. Experiment on Performance Assessment of 100W Fuel Cell.

TERMS & CONDITIONS

- TAXES** : GST @ 5% will be charged extra as shown in our offer.
- Payment** : 90 % Advance along with your purchase order and Balance against delivery.
- Delivery Charges** : At your place free of freight charges.
- Validity** : 90 days from date.
- Warranty** : 1 Year against any manufacturing defects.
- Delivery Period** : 2 – 3 Weeks from the date of your order.

Thanking you in anticipation,

Yours truly,

For Mega Tech Scientific Instruments,



Signature
PRINCIPAL
THAMIRABHARANI ENGINEERING COLLEGE
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 Chidambaramagar - Vegankulam Road,
 Thatchanallur, Tirunelveli - 627 358.

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To
The principal,
ThamiraBharani Engineering College,
Chatthirampukulam village,
Chidambra nagar - Vepakullam road,
Thatchanallur, Thirunelveli - 627358.

Date: 07/11/2019

Kind Attn: HOD / EEE dept.,

Ref: TEC/07/11/2019. EEE dept.

Sub: Submission of Quotation for EEE dept. Renewable Energy Lab
(EE 8712) Equipment - Reg.

Dear Sir,

As per Anna university syllabus R-2017, we are pleased to enclose our lowest QUOTATION for your favorable considerations kindly go through it.

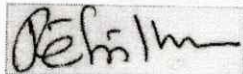
We believe that you will find our offer as quite competitive to your need. If you require any further classifications please do feel free to contact us.

Looking forward to receive your valuable purchase order at the earliest.

Thanking you and assuring of our best & prompt service at all times.

Yours sincerely,

For PRIMETECH INSTRUMENTSS



AUTHORISED SIGNATORY,


PRINCIPAL

THAMIRABHARANI ENGINEERING COLLEGE
Chathirampudukulam Village,
Chidambaranagar - Vepemkulam Road,
Thatchanallur, Tirunelveli - 627 358.

Quotation for Renewable Energy Lab (EE 8712)


As per Anna University Revised Syllabus (R-2017)

S.No:	Description	Qty	Price / unit
1.	Simulation study on solar PV Energy System (Matlab Simulation Program)	1 set	3900.00
2.	Experiment on VI- Characteristics and Efficiency of 1Kwp solar PV System <u>Specification:</u> Solar PV panel -----1000 Wp, 12V/24 V poly crystalline panel Load ----- 5A, AC and DC load Power Conditioning Unit with Voltage sensor-- (0-30) V DC Power Conditioning Unit with Current sensor---(0-10) A (Off-Grid system)	1 set	141000.00
3.	Experiment on "Shadowing effect & diode based solution in 1kWp Solar PV System <u>Specification:</u> PV Panel-----4 x 250 Wp, 12/24 Vm Diode-----4 x 6 A Control & relay circuit---10 A (Solar panel can be used from Experiment S.no:2)	1 set	N.Q.
4.	Experiment on Performance assessment of Grid connected and Standalone 1kWp Solar Power System <u>Specification:</u> Inverter-----1 KVA/ (24-240) V Control Board----- DSC @ 200 MHz Protective Device----- (0-10) A Transformer-----1.5 KVA, 230/12-0-12 V DC Link Bus-----12/24 V DC Load-----250 W (On-Grid system) PV Panel----- (Solar panel can be used from Experiment no:2)	1 Set	66000.00
5.	Simulation Study on Wind Energy Generator (Matlab Simulation Program)	1 Set	3900.00

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6.	<p>Experiment on Performance assessment of micro Wind Energy Generator</p> <p>Specification:</p> <p>PMSG-----500 W, 230 V Diode Bridge-----10 A Buck Converter-----500 VA, 12/24 Vdc</p>	1 Set	96000.00
7.	Simulation study on Hybrid (Solar-Wind) Power System, (Matlab Simulation Program)	1 Set	3900.00
8.	<p>Experiment on Performance Assessment Hybrid (Solar-Wind) Power System</p> <p>Can be done by combining the experiments 4 & 6</p>	1 Set	N.Q
9.	Simulation study on Hydel Power (Matlab Simulation Program)	1 Set	3900.00
10.	<p>Experiment on Performance Assessment of 100W Fuel Cell.</p> <p>Fuel Cell Trainer is a modular experimental system designed to study the working of Solar-Hydrogen cycle. The Reversible Fuel Cell is unique, as it acts as both, an Electrolyzer and a Fuel Cell. This trainer demonstrates Chemistry and Physics principles by experimenting with the splitting of water into its basic elements (hydrogen and oxygen) using renewable power generation from photovoltaic technology (solar panel), and then use this basic element (hydrogen) of water as a renewable "energy carrier" that can power many applications with fuel cell technology.</p> <p>Technical Specification :</p> <p>Fuel Cell Function Output Voltage : 0.9 V DC Output Current : 360 mA Power : 210 mW Volume of Inner Canister for : 16ml Hydrogen/Oxygen Gas Storage</p> <p>Solar Panel Voltage (at optimum power point) : 2.2 V DC Current (at maximum power point) : 450 mA Dimensions : 125 x 155 x 8 (mm)</p> <p>Electrolyzer Function Input Voltage : 1.8 ~ 2.6 V DC Input Current : = 0.7 A Hydrogen Production Rate : 7 ml / min at 1A Oxygen Production Rate : 3.5 ml / min at 1A</p>	1 Set	42000.00


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11.	Simulation study on Intelligent Controllers for Hybrid Systems, (Matlab Simulation Program)	1 Set	3900.00
12.	PV Emulator (100W, 24V) microcontroller based Specification: Transformer-----1 KVA, 230/24 V Diode Bridge-----10A Buck Converter----- 250 VA Control Board-----DSC @ 200 MHz Voltage Sensor-----60 V Current Sensor-----10 A	1 Set	51000.00
13.	Potential meter, Solar panel 100W/24V poly crystalline	01	2100.00
14.	Step down Transformer 230/12-0-12V	01	FREE
15.	Digital multimeter	01	FREE

Quotation for Power Electronics Lab (R-2017)

S.No:	Description	Qty	Price / unit
1.	Triggering Circuit using R, RC and UJT Trainer kit	1 no	6900.00
2.	Characteristics of PMBLDC motor kit with controller unit	1 no	24600.00
3.	Characteristics of GTO trainer kit with meters	1 no	15900.00
4.	Characteristics of IGCT Trainer kit with meters	1 no	16500.00

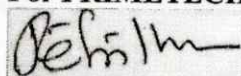
Note: All Required Civil works should be done the client

TERMS AND CONDITIONS:

- i. Validity.....90 Days from the date of offer.
- ii. Payment Terms.....75% advance along with P.O. 25% Immediately after Delivery and installation.
- iii. Delivery.....15 Working days from the date of order.
- iv. Warranty6 years for solar panels from the date of delivery and 2 years for other instruments against manufacturing defects.
- v. Insurance.....Paid by Prime Tech Instrumentss. (For Transport)
- vi. Installation.....Free of Cost at Your Door Step.
- vii. GST.....18% EXTRA. (For Solar panel.....5% extra)
- viii. P and F charges.....NIL
- ix. Subject to Chennai Jurisdiction.

Thanking you,

Yours sincerely,
For PRIMETECH INSTRUMENTSS



AUTHORISED SIGNATOR

PRINCIPAL

THAMIRABHARANI ENGINEERING COLLEGE
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Industrial PLC Automation
IOT Smart Solutions
RF & Advanced Communication
DSP, Embedded & VLSI kits

Renewable Energy Systems
Advanced Process Control
Power Electronics & Drives
Smart GRID Power System
Modern Machines Lab

LabtechTM
TO EXPERIENCE
ENGINEERING

REF: LT/QTN/080516/2018-19

03/01/2019

TO

THE PRINCIPAL
THAMIRABHARANI ENGINEERING COLLEGE
CHIDAMBARANAGAR - VEPANKULAM ROAD,
THATCHANALLUR, THIRUNELVELI(DT.), PIN - 627358

KIND ATTN: HOD/EEE DEPT.,

Dear Sir,

Sub: Submission of TECHNICAL PROPOSAL FOR RENEWABLE ENERGY SYSTEMS LABORATORY FOR 7TH SEM, EEE DEPT AS PER ANNA UNIVERSITY 2017 REGULATION - Reg.

As per the above syllabus, we are pleased to enclose our PROPOSAL for Your favorable consideration.

We believe that you will find our offer as quite competitive and prices are very compelling to your needs. If you require any further clarifications please do feel free to contact us.

Thanking you and assuring of our best & prompt service at all times.

Please call us for further Discussions, Demonstration and Negotiations

We are happy to hear from you in the 20th Celebration Year of LABTECH ELECTRONICS PVT.LTD.

A SPECIAL EARLY BIRD DISCOUNT OF 20% ON ALL EQUIPMENTS EXCEPT OPTIONAL ACCESSORIES WILL BE OFFERED ON ALL BELOW QUOTED PRICES, IF THE ORDER IS PLACED BEFORE MARCH 31st2019

Looking forward to receive your valuable orders and reply at the earliest.

NOTE: Please call us for PRICE, Negotiation and Further Technical Clarification

Yours Sincerely,

Mrs. Muthulakshmi ME., MBA.,
Director



dmj
PRINCIPAL
THAMIRABHARANI ENGINEERING COLLEGE
Chatthirampudukulam Village,
Chidambaranagar - Venemkulam Road,
Thatchanallur, Thirunelveli

**VII SEMESTER BE-ELECTRICAL AND ELECTRONICS ENGINEERING DEPARTMENT
(ANNA UNIVERSITY, CHENNAI 2017 REGULATION)
EE 8712-RENEWABLE ENERGY SYSTEMS LABORATORY- QUOTATION**

<u>S.No</u>	<u>List of Experiments(Exp. Name)</u>	<u>Equipment Name to Used</u>	<u>Qty</u>
1	Simulation study on Solar PV Energy System	Solar PV Emulator with Simulation Software (LT-7003C))	1 set
2	Experiment on "VI – Characteristics and Efficiency of 1kWp Solar PV System"	Solar PV Training System -1kWp (LT-7003A) (with Outdoor panel installation)(Off-Grid System) <u>Optional</u> Artificial Source of radiation 2000W setup (for Indoor panel installation)	1 set 1 set
3	Experiment on "Shadowing effect & Diode Based solution in 1kWp Solar Power System	Above Equipment(Exp.2) can be used	---
4	Experiment on Performance Assessment of Grid Connected Standalone 1kWp Solar Power System	Solar PV Grid-Tied Training System(LT-7003B)) (with Outdoor panel installation) (ON-Grid Solar System) <u>Optional</u> Artificial Source of Radiation 2000W setup (for Indoor panel installation)	1 set 1 set
5	Simulation Study on Wind Energy Gen.	MATLAB can be used	
6.	Experiment on Performance Assessment of Micro Wind Energy Generator	Micro Wind Energy Training System(LT-7003D) <u>Optionals</u> 1.Artificial Wind Generator Unit with safety Grill setup 2.Wind Energy Power and Harmonic Analyzer 3.Anemometer 4.Tachometer	1 set
7.	Simulation Study on Hybrid(Solar-Wind) Power System	MATLAB can be used	-
8	Experiment on Performance assessment of Hybrid (Wind – Solar) Power System	Wind-Solar Hybrid Power System Trainer (LT-7003E)	1 set
9.	Simulation Study on Hydel Power	MATLAB can be used	-
10	Experiment on Performance assessment of 100W Fuel Cell	Fuel cell Energy Training System(LT-7001) <u>Optionals</u> 1.H2 Storage Module – Metal Hydride Canister 1.7 bar 2. H2 Connection Kit 200 bar	1 SET 1 set 1 set
11	Simulation Study on Intelligent Controller for Hybrid Systems	MATLAB can be used	-
12.	Others	<u>Optional Accessories</u> 1. Computers 2. CRO(30Mhz) 3. Digital Multimeter 4. PV Panel(100W 12Vx2) 5. 40Ah Battery 6. Charge Controller(24V)	 9 Nos 10 Nos 2 Nos 2 Nos 1 No

Note: For Cost Reduction: (Item No: 2&4 can also be combined by adding 4 batteries +battery experimental Panel board with Item number 4 with additional cost and it will reduce the cost- to conduct Experiment No: 2,3 &4)



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THAMIRABHARANI ENGINEERING COLLEGE
Chathirampudukulam Village,
Chidambaranagar - Vepemkulam Road,
Thatchanallur, Tirunelveli - 627 358,

TERMS AND CONDITIONS:

- | | |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. GST NUMBER | 33AAACL4910F2Z0 |
| 2. GST CHARGES | 18% EXTRA ON QUOTED PRICE WHICH INCLUDES
CGST+SGST (the client can provide certificate stating that these
product are used for research purpose to avail 5% GST
else it is 18%) |
| 3. ORDER MANDATORY | PLEASE PROVIDE YOUR ORDER NUMBER AND DATE, PLEASE
MENTION THE QUOTATION
NUMBER AND PART NUMBER IN YOUR PO. |
| 4. DELIVERY | WITHIN 6-8 WEEKS FROM THE DATE OF ADVANCE PAYMENT |
| 5. INSTALLATION&COMMISSION | WILL BE PROVIDED BY LABTECH (FACULTY TRAININGS
WILL BE PROVIDED AT EXTRA CHARGES ON REQUEST ONLY
WILL BE PROVIDED BY LABTECH |
| 6. USER MANUAL | 50% ADVANCE AND 50% IMMEDIATELY AFTER DELIVERY&
INSTALLATION. |
| 7. TERMS OF PAYMENT | 3 MONTHS FROM THE DATE OF OFFER |
| 8 .VALIDITY OF OFFER | PENALTY CLAUSE NOT ACCEPTABLE TO LABTECH |
| 9. LATE DELIVERY | 1 YEAR FROM THE DATE OF DELIVERY FOR
MANUFACTURING DEFECTS (AS PER LABTECH GENERAL
WARRANTY CONDITIONS) |
| 10. WARRANTY | EX WORKS |
| 11. TERMS OF DELIVERY | NIL |
| 12. PACKING&FORWARDING | NIL |
| 13. FREIGHT | NIL (IF REQUIRED COST OF INSURANCE WILL BE
CUSTOMER SCOPE) |
| 14. INSURANCE | |

(Note: All required civil works should be done the client)

FOR LABTECH ELECTRONICS. Pvt .Ltd

LABTECH ELECTRONICS PVT. LTD

DIRECTOR

Mrs.Muthulakshmi ME, MBA

Director

CONTACT @ 9840839871/9840839875/9840909211, 044-22250283

Sales@labtechelectronics.com, service@labtech.co.in



PRINCIPAL
THAMIRABHARANI ENGINEERING COLLEGE
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Chidambaranagar - Vepemkulam Road.
Thatchanallur, Tirunelveli - 627 358.

Labtech Electronics Pvt. Ltd.

- ▶ Didactic Training & Research Systems
- ▶ Industrial PLC Automation
- ▶ IOT Smart Solutions
- ▶ RF & Advanced Communication
- ▶ DSP, Embedded & VLSI kits
- ▶ Renewable Energy Systems
- ▶ Advanced Process Control
- ▶ Power Electronics & Drives
- ▶ Smart GRID Power System
- ▶ Modern Machines Lab



TERMS AND CONDITIONS:

- | | |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. GST NUMBER | 33AAACL4910F2Z0 |
| 2. GST CHARGES | 5% EXTRA ON QUOTED PRICE WHICH INCLUDES CGST+SGST (the client can provide certificate stating that these Product is used for research purpose to avail 5% GST else it is 18%) |
| 3. ORDER MANDATORY | PLEASE PROVIDES YOUR ORDER NUMBER AND DATE, PLEASE MENTION THE QUOTATIONNUMBER AND PART NUMBER IN YOUR PO. |
| 4. DELIVERY | WITHIN 6-8 WEEKS FROM THE DATE OF ADVANCE PAYMENT |
| 5. INSTALLATION & COMMISSION | WILL BE PROVIDED BY LABTECH (FACULTY TRAININGS WILL BE PROVIDED AT EXTRA CHARGES ON REQUEST ONLY WILL BE PROVIDED BY LABTECH |
| 6. USER MANUAL | 50% ADVANCE AND 50% IMMEDIATELY AFTER DELIVERY & INSTALLATION. |
| 7. TERMS OF PAYMENT | 3 MONTHS FROM THE DATE OF OFFER |
| 8 .VALIDITY OF OFFER | PENALTY CLAUSE NOT ACCEPTABLE TO LABTECH |
| 9. LATE DELIVERY | 1 YEAR FROM THE DATE OF DELIVERY FOR |
| 10. WARRANTY | (AS PER LABTECH GENERAL WARRANTY CONDITIONS) |
| MANUFACTURING DEFECTS | EX WORKS |
| 11. TERMS OF DELIVERY | 2% |
| 12. PACKING&FORWARDING | 1% |
| 13. FREIGHT | NIL (IF REQUIRED COST OF INSURANCE WILL BE CUSTOMER SCOPE |
| 14. INSURANCE | |

(Note: All required civil works should be done the client)

FOR LABTECH ELECTRONICS.Pvt .Ltd

FOR LABTECH ELECTRONICS PVT. LTD.

S. Murthy
DIRECTOR

Authorized Signatory

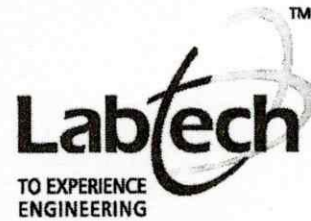
she
PRINCIPAL
THANJAVUR ENGINEERING COLLEGE
Chidambaram, Thanjavur - 627 358.
PRINCIPAL
THANJAVUR ENGINEERING COLLEGE
Chidambaram, Thanjavur - 627 358.

TS. 69A, SIDCO Industrial Estate (Guindy), Ekkattuthangal, Chennai 600032, Tamil Nadu, India.
Tel : +91 44 22250253, Sales : 9840909211, 9840839871, Service : 9840839875
Email : sales@labtech.co.in, Service : service@labtech.co.in
www.labtech.co.in, www.labtechelectronics.com



Labtech Electronics Pvt. Ltd.

- | | |
|--------------------------------------|----------------------------|
| Didactic Training & Research Systems | Renewable Energy Systems |
| Industrial PLC Automation | Advanced Process Control |
| IOT Smart Solutions | Power Electronics & Drives |
| RF & Advanced Communication | Smart GRID Power System |
| DSP, Embedded & VLSI kits | Modern Machines Lab |



Ref No: LT/QTN/080843/2019-20

20/09/2019

To,
Thamirabharani Engineering College
Chitambara nagar-veppamkulam road, Thachanallur,
Tirunelveli, Tamil Nadu 627358

Kind Attn:/ EEE HOD

Dear Sir,

Sub: Submission of QUOTATION FOR RENEWABLE ENERGY SYSTEMS LABORATORY FOR 7TH SEM, EEE DEPT AS PER ANNA UNIVERSITY 2017 REGULATION– Reg.

As per the above syllabus, we are pleased to enclose our PROPOSAL for Your favorable consideration.

We believe that you will find our offer as quite competitive and prices are very compelling to your needs. If you require any further clarifications please do feel free to contact us.

Thanking you and assuring of our best & prompt service at all times.

Please call us for further Discussions, Demonstration and Negotiations.

We are happy to hear from you in the 21ST Celebration Year of LABTECH ELECTRONICS PVT.LTD.

Note:

With reference to the 2017 regulation as per Anna University syllabus, here with enclosed the optimized revised quotation which suitable for conducting all given experiments.

The specifications are restructured as per Anna University syllabus. So, that the cost will be reduced. Kindly contact, if you have any clarification needed.

Special Discount of 10 % can be given as well from the quoted price.

Looking forward to receive your valuable orders and reply at the earliest.

Yours Sincerely,

For Labtech Electronics Private Limited,

FOR LABTECH ELECTRONICS PVT. LTD.

DIRECTOR

Authorized Signatory

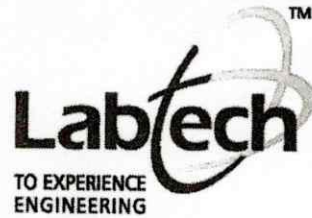
CONTACT @ 9840839871/9840909211/044-48605048/044-23820617

Sales@labtechelectronics.com, service@labtech.co.in


PRINCIPAL
THAMIRABHARANI ENGINEERING
Chathirampudukulam Vi
Chidambaranagar - Vepemk
Thatchanallur, Tirunelveli - 627358

Labtech Electronics Pvt. Ltd.

- ▷ Didactic Training & Research Systems
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- ▷ IOT Smart Solutions
- ▷ RF & Advanced Communication
- ▷ DSP, Embedded & VLSI kits
- ▷ Renewable Energy Systems
- ▷ Advanced Process Control
- ▷ Power Electronics & Drives
- ▷ Smart GRID Power System
- ▷ Modern Machines Lab



QUOTATION

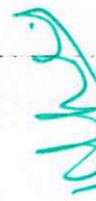
**VII SEMESTER BE-ELECTRICAL AND ELECTRONICS ENGINEERING DEPARTMENT
(ANNA UNIVERSITY, CHENNAI 2017 REGULATION)
EE 8712-RENEWABLE ENERGY SYSTEMS LABORATORY- QUOTATION**

S.No	List of Experiments(Exp. Name)	Equipment Name to Used	Unit Rate	Qty	Amount
	Simulation study on Solar PV Energy System	MATLAB can be used	Model Free	-	-
	Experiment on "VI – Characteristics and Efficiency of 1kWp Solar PV System"	Solar PV Training System -1kWp (LT-7003L) (With both Off-Grid & On-Grid(Grid-Tied) System)	2,89,500	1 Set	2,89,500
	Experiment on "Shadowing effect & iode Based solution in 1kWp Solar Power System"				
	Experiment on Performance Assessment of Grid Connected Standalone 1kWp Solar Power System				
	Simulation Study on Wind Energy Gen.	MATLAB can be used	Model Free	-	-
	Experiment on Performance Assessment of Micro Wind Energy Generator	Equipment in Experiment No.8 can be used	-	-	-
	Simulation Study on Hybrid(Solar-Wind) Power System	MATLAB can be used	-	-	-
	Experiment on Performance assessment of Hybrid (Wind – Solar) Power System	Wind-Solar Hybrid Power system with Micro Wind Energy Generator(LT-7003EL)	2,48,500	1 set	2,48,500
	Simulation Study on Hydel Power	MATLAB can be used	Model Free	-	-
	Experiment on Performance assessment of 100W Fuel Cell	Fuel cell Energy Training System(LT-7001) OPTIONAL: Accessories: Hydrogen cylinder with Dual regulator of rate Rs.29,400/-	3,48,500	1 SET	3,48,500
	Simulation Study on Intelligent Controller for Hybrid Systems	MATLAB can be used	Model Free	-	-
				TOTAL	8,86,500
				GST 18%	EXTRA
				(Note: REFER TERMS & CONDITIONS NO.2, TO AVAIL 5% GST Extra)	

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 Chathirampudakulam
 Chidambaramnagar
 Thatchanallur, Tamil Nadu - 608 006.

Thamirabharani Engineering College
Department of EEE
Renewable Energy Lab/EE 8712 (R-2017)
Lab Equipment Quotation

Sl. No.	Description	Quantity	Prime Tech		Samtech solutions		Zealtech		Labtech Electronics Pvt. Ltd.	
			Price/unit (Rs.)	3,900	Price/unit (Rs.)	Free	Price/unit (Rs.)	-	Price/unit (Rs.)	Model Free
1	Simulation study on solar PV Energy System (MATLAB Simulation Program)	1	1,41,000		1,50,000					2,89,500
2	Experiment on VI- Characteristics and Efficiency of 1Kwp solar PV System	1	Equipment in Ex.2 can be used							
3	Experiment on "Shadowing effect & diode based solution in 1kWp Solar PV System (Solar panel can be used from Experiment S.no:2)	1								
4	Experiment on Performance assessment of Grid connected and Standalone 1kWp Solar Power System (Solar panel can be used from		66,000							


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5	Simulation Study on Wind Energy Generator (Matlab Simulation Program)	1	3,900	Free	-	Model free
6	Experiment on Performance assessment of micro Wind Energy Generator	1	96,000	Equipment in Ex.8 can be used	Equipment in Ex.8 can be used	Equipment in Ex.8 can be used
7	Simulation study on Hybrid (Solar-Wind) Power System, (Matlab Simulation Program)	1	3,900	Free	-	Model free
8	Experiment on Performance Assessment Hybrid (Solar- Wind) Power System	1	Equipment in Ex. 4&6 can be used	1,70,000	3,20,000	2,48,500
9	Simulation study on Hydel Power (Matlab Simulation Program)	1	3,900	Free	-	Model free
10	Experiment on Performance Assessment of 100W Fuel Cell.	1	42,000	3,00,000	3,96,000	3,48,500
11	Simulation study on Intelligent Controllers for Hybrid Systems, (Matlab Simulation Program)	1	3,900	Free	-	Model free
12	PV Emulator (100W, 24V)	1	51,000	NQ	72,000	2,49,500
13	Potentiometer, Solar panel 100W 24V polycrystalline	1	2,100	NQ	NQ	12,000
14	Step down Transformer (230/12-0-12V)	1	FREE	NQ	NQ	
15	Digital multimeter	1	FREE	800	NQ	


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 Chidambaram Road,
 Chidambaram, Tirunelveli-627 358.

16	Battery storage system with charge and discharge control 40Ah	1	NQ	NQ	NQ	12,900
17	CRO	1	NQ	20,500	NQ	NQ
Total amount in Rs.			4,13,700	5,69,300	10,68,000	11,62,800


 5/12/19
 (S/D / EEE)


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 Chidambaranagar - Vepemkulam Road,
 Thatchanallur, Tirunelveli - 627 358.


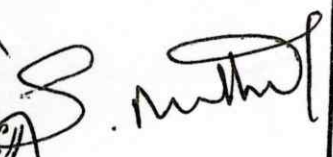
TAX INVOICE

Company Address	Invoice No.	Dated
M/S Labtech Electronics Pvt. Ltd., TS-69A, SIDCO INDUSTRIAL ESTATE(GUINDY) EKKATTUTHANGAL, CHENNAI -600032 Ph:044-22250253, 9840839871 Email:admin2@labtech.co.in GSTIN:33AAACL4910F2ZO	LTE/INV/2020-21/018 Delivery Time 2-3 Weeks Supplier's Ref. TEC/PO/EEE/2020-21 Mode of Dispatch : ROAD	7-Nov-2020 Terms of Payment 50% Adv &50% Against Delivery DATED 22-OCT-2020

Billing Address	Shipping Address
The Principal M/s. Thamirabharani Engineering College Chathirampudukulam, Chidambaranagar Vepemkulam Road, Thatchanallur , Tirunelveli -627 358. GST : NA	The Principal M/s. Thamirabharani Engineering College Chathirampudukulam, Chidambaranagar, Vepemkulam Road, Thatchanallur , Tirunelveli -627 358. GST : NA

S. No	Description of Goods	Qty	Unit Price	Total Price
1	Experiment on " VI Characteristics and Efficiency of 1kWp Solar Power System Experiment on " Shadowing effect and diode based solution in 1 kWp Solar PV system Experiment on Performance assessment of Grid connected Standalone 1 KWp Solar Power System	1	202650	202650.00
2	Experiment on Perfomance assessment of Micro Wind Energy Generator	1	173950	173950.00
3	Experiment on Performance assessment of 100W Fuel cell with Hydrogen Cylinder - dual regulator	1	264530	264530.00
4	Solar PV Emulator (LT 7013L)	1	104650	104650.00
5	Grill Work	1	10000	10000.00
Sub Total				7,55,780.00
GST@5%				37,789.00
Total		1		7,93,569.00

Amount in Words	Company Bank Details
Rupees Seven Lakh Ninety Three Thousand Five Hundred and Sixty Nine Only	Labtech Electronics Private Limited Bank Name : STATE BANK OF INDIA AC No.: 38084448691 Branch :EKKADUTHANGAL IFSC : SBIN0004033 PAN: AAACL4910F

Declaration	for Labtech Electronics Pvt. Ltd.,
We Declare that this invoice shows the actual goods described and that all particulars are true and correct	  THAMIRABHARANI ENGINEERING COLLEGE Chathirampudukulam Village, Chidambaranagar - Vepemkulam Road, Thatchanallur, Tirunelveli - 627 358.

Copy

DELIVERY CHALLAN/SHIPPING LIST		
Company Address	Delivery Challan No	Dated
M/S Labtech Electronics Pvt Ltd, TS-69A, SIDCO INDUSTRIAL ESTATE(GUINDY) PKKATTUTHANGAL, CHENNAI - 600032 044-22250253, 9840839875 labtechadmin@labtech.co.in GSTIN:33AAACL4910F2Z0	LTE/DC/2020-21/019 Customer's Ref. TEC/PO/EEE/2020-21 Invoice Number LTE/INV/2020-21/018 Mode of Transport	7.11.2020 Dated 22.10.2020 Dated 7.11.2020 By Road
Sending Address	Shipping Address	
The Principal M/s. Thamirabharani Engineering College Chathirampudukulam, Chidambaranagar Vepemkulam Road, Thatchanallur, Tirunelveli - 627 358.	The Principal M/s. Thamirabharani Engineering College Chathirampudukulam, Chidambaranagar Vepemkulam Road, Thatchanallur, Tirunelveli - 627 GST : NA	

Sl. No.	Description of Goods	Qty	Remarks
1	SOLAR PV TRAINING SYSTEM 1KW WITH OFF-GRID AND GRID-TIED INVERTERS AND EXP. SETUP (LT7003L)	1 SET	for Delivery
	CONTROL PANEL BUILT-IN ITEMS	4	Against Purchase Order
	SOLAR PV MODULE (265W,24V,9A)(MNRE APPROVED)	1	
	SOLAR PV GRID TIED INVERTER (1-PHASE, 1KW, 70-300V)	1	
	1GT WIFI DONGLE FOR ON GRID INVERTER	1	
	SOLAR POWER CONDITIONING UNIT (PCU, 1-PHASE,1.4KVA, 24/36V I/P)	1	
	CONTROL PANEL AND MEASURING UNIT WITH METERS	1	
	WIND PROTECTION MODULES	1	
	12V POWER QUALITY MONITOR	1	
	LOAD UNIT (LABTECH)	2	
	4 Ah/12V BATTERY	3 SET	
	EXTERNAL ITEMS	1 SET	
	SOLAR PV FIXING STAND(FOR 1KW PANEL IN ROOFTOP)	1	
	ANCHOR BOLT SET AND FASTNERS	1	
	3 CORE CABLE - 20 METERS	4 EACH	
	MICRO CONNECTORS MALE & FEMALE FOR SOLAR PANELS	1	
	25W LAMP 120V/100W - 2	1	
	12V DC LAMP - 1	1	
	AC POWER CORD WITH SOCKET	1 SET	
	POWER ANALYZER MANUAL, SOLAR PCU MANUAL AND ONGRID INVERTER MANUAL	20 NOS	
	PATCH CORDS (VARIOUS SIZES)	1 SET	
2	WIND SOLAR HYBRID POWER SYSTEM WITH MICRO WIND ENERGY GENERATOR (LT7003EL)		
	CONTROL PANEL BUILT-IN ITEMS	1	
	SOLAR PV MODULE (100W, 12V, MNRE APPROVED)	1	
	HYBRID CHARGE CONTROLLER 20A	1	
	INVERTER (1-PHASE, 850VA,12V I/P),230VAC O/P	1	
	4Ah/12V BATTERY	1	
	1-PHASE SPECIFIC MODULE(12V DC)	1	
	12V 1000 POWER QUALITY MONITOR	1	
	LOAD UNIT (LABTECH)	1	
	CONTROL PANEL AND MEASURING UNIT WITH METERS	1	
	EXTERNAL ITEMS	1	
	MICRO WIND TURBINE(12V,200W,3 -PH PMSG WITH STAND ASSMBLY & 3 CORE CABLE)	1	
	ARTIFICIAL WIND GENERATOR ASSEMBLY, SIMULATED WIND SOURCE,3 CORE WIRE 2MT	1	
	ARTIFICIAL SOLAR ASEMBLY FOR SIMULATED SOLAR LIGHT SOURCE, 500W HALOGEN	1	
	3 CORE WIRE ASSEMBLY(2 MT)	1	
	AC POWER CORD WITH SOCKET	15 NOS	
	PATCH CORDS (VARIOUS SIZES)	1	
	NON CONTACT TYPE TACHO METER	1	
	WIND ANEMOMETER	1 SET	
	BOLT & NUT SET AND FASTNERS	1 SET	
	MICRO CONNECTORS MALE & FEMALE FOR SOLAR PANEL WITH 2 CORE CABLE	1	
	25W LAMP 120V/100W	1	
	12V DC LAMP	1 set	
	POWER ANALYZER MANUAL, INVERTER MANUAL	1 SET	
	3 CORE WIRE UNDER INCLINOMETER WITH MAGNETIC BASE	1 SET	
3	PHOTO CELL ENERGY TRAINING SYSTEM(LT-7001EL)		
	CONTROL PANEL BUILT-IN ITEMS	1	
	12V 1000 POWER QUALITY MONITOR	1	
	12V 1000 WITH ON/OFF SWITCHES	1	
	12V 1000 WIRE SENSOR WITH INDICATOR	1	
	CONTROL PANEL AND MEASURING UNIT WITH METERS	1	
	HYBRID CHARGE CONTROLLER 20A	1	

PRINCIPAL
THAMIRABHARANI ENGINEERING COLLEGE
 Chathirampudukulam Village,
 Chidambaranagar - Vepemkulam Road,
 Thatchanallur, Tirunelveli - 627 358,

	42AH/12V BATTERY ✓ LOAD UNIT (LABTECH) ✓ EXTERNAL ITEMS HYDROGEN CYLINDER 10CUM FILLED WITH 10 LITTER HYDROGEN GAS ✓ DOUBLE STAGE DOUBLE GAUGE HYDROGEN REGULATOR(0-280KG INLET/0-16KG OUTLET MAX WORKING PRESSURE 0-9KG) ✓ PU TUBE 1 METER WITH SOLENOID VALVE FOR HYDROGEN INLET ✓ OPENING KEY FOR HYDROGEN CYLINDER ✓ AC POWER CORD WITH SOCKET ✓ PATCH CORDS (VARIOUS SIZES) ✓ BOLT & NUT SET AND FASTNERS ✓ 12V DC LAMP ✓ BATTERY WARRANTY CARD WITH SERIAL NUMBER ✓ SAFETY GRILL SETUP FOR WIND TURBINE (4 SIDES DOOR MESH) ✓	1 1 1 1 1 1 10 1 set 1 1 1 SET	
4	SOLAR PV EMULATOR WITH SOFTWARE 1 KW, 2- CHANNEL(MAX 50V/10A DC, 500W EACH CHANNEL) SOLAR PV EMULATOR ✓ SOLAR PV EMULATOR SOFTWARE ✓ CONTROL/MEASUREMENT PANEL WITH METERS ✓ USB CABLE FOR PC INTERFACE ✓ AC POWER CORD WITH SOCKET ✓ PATCH CORDS (VARIOUS SIZES) ✓	1 SET 1 SET 1 SET 1 1 1	
5	OTHER ACCESSORIES USB TO RS485 CONVERTER WITH SOFTWARE FOR DATA LOGGING ✓ SOFTCOPIES- LT-DAQ DRIVER S/W, USB DRIVER S/W ✓ MATLAB EXPERIMENTS S/C (FREE WARE)(FOR ANNA UNIVERSITY RE LAB REG 2017 EXP) ✓ PRODUCT DEMO VIDEOS S/C ✓ EXPERIMENT AND USER MANUAL H/C ✓ RE LAB LAYOUT AND ROOFTOP STRUCTURE ✓	1 SET 1 SET 1 SET 1 SET 1 SET	

LABTECH STAFF VERIFIED AND SIGNED BY(NAME WITH SIGNATURE):

Pillai

Abey

Declaration: We Declare that this DC and Packing list shows the actual goods described and all particulars are true and correct E.&O.E

PLEASE VERIFY THE LIST ITEMWISE AND SIGN. LABTECH WILL NOT BE RESPONSIBLE AFTER SIGNING FOR ANY MISSING OR LOSS ITEMS

CUSTOMER SIGNATURE WITH SEAL

for Labtech Electronics Private Ltd

[Faint signature]



Verified
[Signature]
10/10/2017
APPEAR

[Signature]
PRINCIPAL
THAMIRABHARANI ENGINEERING COLLEGE
Chathirampudukulam Village,
Chidambaranagar - Vepenkulam Road,
Thatchanallur, Tirunelveli - 627 358.



THAMIRABHARANI ENGINEERING COLLEGE

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

Chathirampudukulam, Chidambaranagar - Vepemkulam Road

Thatchanallur, Tirunelveli 627 358, Tamil Nadu.



Renewable energy laboratory setup

dmr
PRINCIPAL
THAMIRABHARANI ENGINEERING COLLEGE
Chathirampudukulam Village,
Chidambaranagar - Vepemkulam Road,
Thatchanallur, Tirunelveli - 627 358