



Institute of Engineering & Technology, Lucknow, Sitapur Road, Lucknow,  
Uttar Pradesh - 226021

### INVITATION LETTER

Package Code: TEQIP-III/2019/UP/IET/269

Package Name: IET-TEQIP-EED-LAB-4

IET/TEQIP-III/2019-232-0

Current Date: 06-Jul-2019

Method: Shopping Goods

Sub: INVITATION LETTER FOR IET-TEQIP-EED-LAB-4

Dear Sir,

- You are invited to submit your most competitive quotation for the following goods with item wise detailed specifications given at Annexure I,

| Sr. No | Item Name                                      | Quantity | Place of Delivery                                | Installation Requirement (if any) |
|--------|--|----------|--|-----------------------------------|
| 1      | SCR SINGLE PHASE CONTROLLED RECTIFIER          | 2        | Institute of Engineering and Technology, Lucknow |                                   |
| 2      | POWER ELECTRONICS TRAINING SYSTEM              | 1        | Institute of Engineering and Technology, Lucknow |                                   |
| 3      | SCR VI CHARACTERISTICS TRAINER KIT             | 2        | Institute of Engineering and Technology, Lucknow |                                   |
| 4      | POWER ELECTRONICS TRAINER (6 APPLICATION)      | 2        | Institute of Engineering and Technology, Lucknow |                                   |
| 5      | 3-PHASE HIGH VOLTAGE THYRISTOR CONTROL TRAINER | 1        | Institute of Engineering and Technology, Lucknow |                                   |

- Government of India has received a credit from the International Development Association (IDA) towards the cost of the Technical Education Quality Improvement Programme [TEQIP]-Phase III Project and Intends to apply part of the proceeds of this credit to eligible payments under the contract for which this invitation for quotations is issued.


#### 3. Quotation

- The contract shall be for the full quantity as described above.

- 3.2 Corrections, if any, shall be made by crossing out, initialling, dating and re writing.
- 3.3 All duties and other levies payable by the supplier under the contract shall be included in the unit Price.
- 3.4 Applicable taxes shall be quoted separately for all items.
- 3.5 The prices quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.
- 3.6 The Prices should be quoted in Indian Rupees only.
4. Each bidder shall submit only one quotation.
5. Quotation shall remain valid for a period not less than 60days after the last date of quotation submission.
6. Evaluation of Quotations: The Purchaser will evaluate and compare the quotations determined to be Substantially responsive i.e. which
- 6.1 are properly signed; and
- 6.2 Confirm to the terms and conditions, and specifications.
7. The Quotations would be evaluated for all items together.
8. Award of contract The Purchaser will award the contract to the bidder whose quotation has been determined to be substantially responsive and who has offered the lowest evaluated quotation price.
- 8.1 Notwithstanding the above, the Purchaser reserves the right to accept or reject any quotations and to cancel the bidding process and reject all quotations at any time prior to the award of Contract.
- 8.2 The bidder whose bid is accepted will be notified of the award of contract by the Purchaser prior to expiration of the quotation validity period. The terms of the accepted offer shall be Incorporated in the purchase order.
9. Payment shall be made in Indian Rupees as follows:
- Satisfactory Delivery & Installation and Acceptance - 100% of total cost**
10. Liquidated Damages will be applied as per the below:  
Liquidated Damages Per Day Min % :0.50  
Liquidated Damages Max % : 10
11. All supplied items are under warranty of 12 months from the date of successful acceptance of items and AMC/Others is .
12. You are requested to provide your offer latest by 14:00 hours on 22-Jul-2019.



13. Detailed specifications of the items are at Annexure I.
14. Training Clause (if any) YES
15. Testing/Installation Clause (if any) YES
16. Performance Security shall be applicable: 5%
17. Information brochures/ Product catalogue, if any must be accompanied with the quotation clearly indicating the model quoted for.
18. Sealed quotation to be submitted/ delivered at the address mentioned below, TEQIP-III  
Institute of Engineering & Technology, Lucknow, Sitapur Road, Lucknow, Uttar  
Pradesh - 226021
19. We look forward to receiving your quotation and thank you for your interest in this project.

  
(Authorized Signatory)

Name & Designation  
**COORDINATOR**  
**TEQIP PHASE-III**  
**Institute of Engineering &**  
**Technology, Lucknow-21**

| Sr. No | Item Name                             | Specifications  |
|--------|---------------------------------------|---|
| 1      | SCR SINGLE PHASE CONTROLLED RECTIFIER | <p>SCR Trainer System to understand SCR phase control. Functional block diagrams are provided on-board for Teaching/Training.</p> <p>This Trainer provides with various Test Points to Measure the Parameters on Multimeter and CRO.</p> <p>Functional blocks indicated on board mimic Input-output and Test Points provided onboard</p> <p>Built in 30V AC Power Supply</p> <p>Fully documented operating manual</p> <p>Additional Passive elements are also provided</p> <p>Attractive plastic enclosures of Light weight</p> <p>Wave form study of SCR Phase control.</p>  |
| 2      | POWER ELECTRONICS TRAINING SYSTEM     | <p>Should have Master unit carrying useful experiment resources like line Synchronised firing circuits, Power supplies, lamp load, RLC loads, Battery charging supply etc. while the central slot will hold replaceable experiment panels. Each multi experiment panel must be secured in an ABS molded plastic sturdy enclosure, and must have colorful screw less overlay showing circuit &amp; Connection through Sturdy 4mm. Power scope should be supplied with this</p> <p>Banana Sockets &amp; Patch Chords.</p> <p><b>Master Unit-6 Qty.</b> (Should have Built in power supply DC supply : <math>\pm 12V</math>, 500mA, Unreg Power supply 17V / 750mA,</p> <p>Regulated 13.5V/3A O/P must be provided as 12V Battery charging supply. In absence of battery, same may be used as simulated battery source to run experiments on inverters etc.</p> <p>Isolated DC supply +12V/ 300mA with isolated common.</p> <p>On board Inverter transformer of Primary : 230V &amp; Secondaries 12-11-0-11-12/3A On board Lamp load of 15W (100W) should be provided. AC supply : 230V AC line voltage must be made available on two banana 4mm sockets.</p> <p>LSPT Panel consisting of</p> <p>Must have Two pulse transformers of 1:1:1 are provided for isolation &amp; supplying firing pulses along with required DC Power supply to experiment panel under test through 15 pin female 'D' connector.</p> <p>R-L-C Load Panel</p> <p>Must have Load resistor of 10W / 40W --- 1no.</p> <p>Must have Centre tapped 3A choke 4mH/ 16mH each ----</p> |



2nos.

Must have Commutation capacitors of 10mF/100V -----

4nos.

Must have AC Paper capacitor of 4mF/440V ---1no.)

1) Power Semiconductor Application Experiment panel -1  
No.

(Should have Triac lamp dimmer, AC fan regulator, SCR operated light sensitive switch using LDR, SCR operated temperature sensitive switch using thermistor, UJT relaxation oscillator, Half and full wave ( Phase shift controlled ) rectifier using SCR, Timer using SCR & UJT. Built in Lamp load.)

2) Power Semiconductor Application Experiment Panel -1  
No.

(Should have SCR phase shift controlled converter using IC555 through opto isolator (Potentiometric), Triac AC power control using IC 555 ( Potentiometric) (optoisolated), Triac AC

power control using UJT ( Potentiometric), SCR/Triac temperature control using thermister, SCR/Triac intensity control using LDR, Opto isolated DC switch & Photo relay)

3) CON / INV Panel- 2 Nos.(SCR Converters must be Provided with sturdy 800V/12A SCRs (4nos) with uncommitted

Snubbers, 6A diodes (2nos) commutation switch, 47m/450V cap, Ramp cosine firing circuit. However actual working currents are limited to 3A (max) for safety. Must have facility to study Advanced firing Schemes, SCR forced Commutation Techniques, SCR based Inverters , Cycloconverter, SCR based Chopper.)

4) Triggering circuit / dv/dt Protection panel-1 No.

(Must have facility to study SCR Triggering Schemes / turn ON methods. Traic Triggering Schemes / turn ON methods dv/dt behavior of SCR)

5) SCR Application Panel-1 No.

(must be able to Study Zero Voltage Line switching & Integral cycle control using SCR. Study of SCR based Ring Counter for sequential switching.AC voltage control using SCR based transformer tap changer.SCR based AC flasher / DC flasher.)

6) IGBT / MOSFET Inverter Panel -2 Nos.

(Should be able to study MOSFET / IGBT based step down Chopper.MOSFET / IGBT push pull inverter

|   |  |   |
|---|--|---|
|   |  | <p>200H/2000Hz.)</p> <p>7) PMDC Motors-2 NOS.provided for closed loop experiments with foot mounting PMDC motor (200W/2000RPM) with Tacho feedback (10V per 1000RPM) loading arrangement using spring balances (25kg). This also may be used for Chopper application. However needs AUX DC 200Vdc/500mA as Armature supply.)</p> <p>8) Fractional HP Universal AC/DC motor 230V AC/1/12HP-2 NOs.(Spring balance loaded chasis mounted for converter as well as controller application)</p>  |
| 3 | SCR VI CHARACTERISTICS TRAINER KIT             | <p>SCR Characteristics kit</p> <p>Mains supply 230V <math>\pm 10\%</math>, 50Hz</p> <p>Voltmeter: 35V (max)</p> <p>Ammeter: 50 mA (max)</p>   |
| 4 | POWER ELECTRONICS TRAINER (6 APPLICATION)      | <p>Covers different power electronics devices i.e Thyristors MOSFET TRIAC DIAC ETC, On-board components, External AC / DC Power supply, On board variable DC/AC supply, ranging from 0~30VAC/50Hz, DC supply of +15V</p> <p>Characteristics study of different types of power electronics Devices i.e. thyristors (SCR, TRIAC, DIAC), UJT, MOSFET, etc. provided with meters or others units with USB Interface.</p> <p>Application study of different types of power electronics Devices i.e. thyristors (SCR, TRIAC, DIAC) and MOSFET</p> <p>Different gate-pulsing and commutation circuits</p> <p>Different IC's for gate triggering circuits</p> <p>Freewheeling diodes, Resistor, Capacitors, Inductors, Potentiometers provide onboard with Instruction,</p> <p>Input 3 phase DOL Starter panel (10 Shrouded Banana)</p> <p>4 Pole MCB of 415V/4A.</p> <p>DOL 9A contactor with 230V/50Hz/11VA COIL.</p> <p>Bimetallic thermal O/L relay with range 1.4A-2.3A.</p> <p>DC voltmeter and DC ammeter panel (6 Shrouded Banana)</p> <p>DC voltmeter (0-600V)</p> <p>DC Ammeter (0-5A) with polarity protection diode</p> <p>Lamp Load (12 Shrouded Banana)</p> <p>230V/15/40/60/100W X3 bulbs with individual ON/OFF using 6A toggle switch.</p> |
| 5 | 3-PHASE HIGH VOLTAGE THYRISTOR CONTROL TRAINER |   |



Inductive (L) Load (18 Shrouded Banana)

Inductive load=0.75W/3H/300mA X 3 Nos.

3 Ph. Bidirectional power cum Energy meter panel (8 shrouded Banana)

- Bidirectional Multifunction • 3 Phase  $\frac{3}{4}$  wire, 415V CT Input 5A

- LCD/LED display, Aux. supply 230V, 45-65 Hz, 5W

- V, I, Hz, Pf, KVA, KW, KWh • Modbus RTU RS 485 (optional)

6 SCR Firing/Synchronizing Panel (8 Shrouded Banana)

Cosine firing scheme to facilitate linear control for better harmonic ripple control.

Cyclo converter frequency generator 25Hz/12.5Hz

6 SCR/Diode Power Module (36 Shrouded Banana)

Consist of 6 SCR [Anode to body type] with PIV rating 1200V/25A.

6 Diode with PIV rating of 1200V/16Amp

6 No. of uncommitted Snubbers for protection of thyristors consisting of capacitor 0.1 $\mu$ F/1000V & 100E/5W ceramic resistors.

**FORMAT FOR QUOTATION SUBMISSION**  
(In letterhead of the supplier with seal)

Date: \_\_\_\_\_

To: \_\_\_\_\_

| Sl. No.           | Description of goods \ (with full Specifications) | Qty. | Unit | Quoted Unit rate in Rs.<br>(Including Ex-Factory price, excise duty, packing and forwarding, transportation, insurance, other local costs incidental to delivery and warranty/ guaranty commitments) | Total Price<br>(A) | Sales tax and other taxes payable |                |
|-------------------|---|------|------|--|--------------------|-----------------------------------|----------------|
|                   |   |      |      |  |                    | In %                              | In figures (₹) |
|                   |   |      |      |  |                    |                                   |                |
|                   |   |      |      |  |                    |                                   |                |
| <b>Total Cost</b> |   |      |      |  |                    |                                   |                |

We agree to supply the above goods in accordance with the technical specifications for a total contract price of Rs. \_\_\_\_\_ Gross Total Cost (A+B): Rs. \_\_\_\_\_  
 (Rupees \_\_\_\_\_ amount in words) within the period specified in the invitation for Quotations.  
 We confirm that the normal commercial warranty/ guarantee of \_\_\_\_\_ months shall apply to the offered items and we also confirm to agree with terms and conditions as mentioned in the Invitation Letter.  
 We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in bribery.

Signature of Supplier

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Contact No. \_\_\_\_\_