TRIPURA UNIVERSITY
(A Central University)
Suryamaninagar
Tripura West – 799022

No.TU/FIN/Equip/Engg/187/Vol-II/EE/12 **Date: 20-01-2025**

NOTICE INVITING e- TENDER

Tripura University invite e- Tender from the bonafide Manufacturers/Authorized Dealers for supply and installation of Equipments for the Department of Electrical Engineering, Tripura University. The Details can be seen at Tripura University website: *www.tripurauniv.ac.in*. However, for submission of documents please visit https://eprocure.gov.in/eprocure/app

Sd/-
[Sri Pranay Pal]
Asstt. Registrar (Finance)

TRIPURA UNIVERSITY

(A CENTRAL UNIVERSITY)

Tender No:- No.TU/FIN/Equip/Engg/187/Vol-II/EE/12

E-TENDER Document for:

Name of the Item: - Supply and Installation of Equipment's for the Department of Electrical Engineering Tripura University, Suryamaninagar.

TRIPURA UNIVERSITY

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Suryamaninagar – 799022

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No.TU/FIN/Equip/Engg/187/Vol-II/EE/12 **Date: 20-01-2025**

Name of Item: Supply and Installation of Equipment's for the Department of Electrical Engineering Tripura University.

Certified that this Notice Inviting e-Tender contains 12 (Twelve) pages numbered from 1 to 12 and schedule of the e-Tender is shown in Section – I

(Sri Pranay Pal)
Asstt. Registrar (Finance)

SECTION- I

NOTICE INVITING TENDERS

LIST OF DATES

TRIPURA UNIVERSITY

(A Central University)

Suryamaninagar – 799022

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NOTICE INVITING e-TENDER

1. Tripura University invite e- Tender from the bonafide Manufacturers/authorized Dealers for Supply and Installation of Equipment's for the Department of Electrical Engineering Tripura University, Suryamaninagar. The Details can be seen at Tripura University website: *www.tripurauniv.ac.in*. However, for submission of documents please visit https://eprocure.gov.in/eprocure/app

List of Items with Specification and quantity

Sl No	Name of Instrument	Specifications	Qty.
01	Modular Power Electronics Teaching Setup with Triggering circuit / dv/dt Protection panel & PC based DAQ system:	The Model should be consist of following three setup 1. **Modular Power Electronics Teaching Setup with Triggering circuit / dv/dt Protection panel & PC based DAQ system:** System Should Consist of following: a. Master Unit with swappable experimental panel fitting option: System should be aesthetically designed injection molded electronic desk. It should have useful experiment resources like line Synchronized firing circuits, Power supplies, lamp load, RLC loads, Battery charging supply etc. while the central slot should hold replaceable experiment panels. Experiment panel should be secured in an ABS molded plastic sturdy enclosure and should have colorful screw less overlay showing circuit & Connection through Sturdy 4mm Banana Sockets & Patch Chords. Set of User Guide need to provide with each unit. **Specification –** • Built in Power supply with DC + 12V, 500mA • Unregulated Power supply 17V / 750mA • Regulated 7VDC to 14VDC/3A O/P is provided as 12V Battery charging supply. In absence of battery, same may be used as simulated battery source to run experiments on inverters etc. • Isolated DC supply +12V/ 300amA with isolated common. • On board Inverter transformer of Primary & Secondaries: 12-11-0-11-12/3A. • On board o/p to Isolated Drive Circuit • AC supply: 230V AC line voltage is made available on two banana 4mm sockets as well as 1.5A fuse extender for variac if used. • Aux DC Power Supply: Variable upto 200Vdc/0.5Amp (Phase controlled Thyristor half bridge)	01 No

		LSPT Panel consisting of • Two pulse transformers of 1:1:1 are provided for isolation & supplying firing pulses along with required DC Power supply to experiment panel under test through 15 pin female 'D' connector. • Selector switch of 2 pole 6 way for selecting different types of firing pulses like out of phase inverter firing using LM3525 with dead time, freq. Control in freq variation from 170 Hz to 250Hz, 12.5/25/6..25 Hz Frequency gated with High Frequency (3KHz) for Cycloconverter, line Synchronized UJT firing for converter and pulse width R-L-C Load Panel • Load resistor of 10ohm/ 40W and 100ohm / 10W - 1No.each • Centre tapped 3A choke 4mH/ 16mH each - 2Nos. • DC choke 0-100-200 mH/750mA- 1No. • Commutation capacitors of 10uF/100V - 4Nos. • AC Paper capacitor of 4uF/440V - 1No. • DC Cap 220uF / 63V- 1No. • Diode BYT 71 (5407)- 1 No. • On board Lamp load of 15W/ 230VAC provided Accessories: • 15 pin D connector cable assembly • 4mm patchcords : 100mm X 10 Nos & 500mm X 20 Nos. b**. Experimental Panel for Triggering circuit / dv/dt Protection:** SCR Triggering Schemes / turn ON methods. • Simple Resistance firing circuit for upto 90 SCR firing half wave. • Resistance - Capacitor firing circuit with increased control SCR firing - half Wave & full wave. • UJT/PUT based SCR Trigger with series/ shunt transistor controlled ramp, resistance controlled Pedestal TRIAC Triggering Schemes / turn ON methods. • Simple Resistance firing circuit for TRIAC firing Full wave. • UJT/PUT based TRIAC Trigger with series/ shunt transistor controlled ramp, resistance controlled Pedestal dv/dt behaviour of SCR • Study of SCR dv/dt protection using gate termination. • Study of SCR dv/dt protection using gate reverse bias with resistance. • Study of SCR dv/dt protection using gate reverse bias with resistance and diode. • Study of SCR dv/dt protection using polarised snubber. • Study of SCR dv/dt protection using polarised RC snubber with discharge resistor. • Study of Triac dv/dt protection using RC Snubber.	

		c. **USB based DAQ system:** • Should be programmable with LabVIEW • Supported Power Input: Bus Powered • Maximum Number of Single-Ended Analog Input Channels: 8 • Differential channel: 4 • Analog Input Resolution: 16 bits • Analog Input FIFO Buffer Size: 2047 samples • Maximum Sample Rate: 50 kS/s • Number of Analog Output Channels: 2 • Bus Connector: USB 2.0 • Number of Bidirectional Digital Channels: 13 • 01 Nos 32-bit Counter with Maximum input frequency 5 MHz • +5 V Power Source with max current 150 mA	
02	Teaching Setup for AC Motor Speed Control	Setup Should have following feature – • The trainer should have panels (4 nos. typically) which should be mounted in a light weight sturdy aluminum flat demo panel system. • Should have easy and safe wiring facility with 4mm sturdy shrouded banana patch cords and shrouded socket arrangement for high voltage circuits. • Each panel should have ABS molded plastic sturdy enclosure, and colorful screwless overlays showing circuit diagram & its connection tag numbers for easy understanding and connections. • Set of Instructor Guide & Student Workbook. Should include below panels – • AC voltmeter and AC ammeter panel: a) AC voltmeter (0-300V); b) AC Ammeter (0-1A). • Instrumentation Power supply cum Multi-channel DPM panel: (a) +/-12 V, 500 mA (b) +5V, 300mA (c) Unregulated 17V dc/750 mA (d) line synchronizing signal. (e) Multi channel DPM for digital display of speed. • SCR Actuator (variable AC) cum sensor signal conditioning panel: i) Full bridge SCR based 0V-230VAC / 12 Amp cosine firing with linear characteristics. This supply is required for AC motor armature. ii) Supports signal conditioning circuit for speed to give output 0-2.5Vdc (FS). • Electronic tacho 0 -1V/1000 rpm • Motor Specifications: Table Top Machines / Accessories : Fractional HP AC/DC, Motor 230VAC, 1/12 HP. Chasis mounted table top with brake pulley and spring balance [5kg] loading arrangement. List of Experiments should cover: 1. Open loop torque speed characteristics. 2. Closed loop speed control with speed feedback using P/PI mode	01
03	Laboratory Multimeter	Specification for 1. General Requirements: Instrument Type: Digital Multimeter Quantity: 1 Unit Compliance: Must comply with international standards such as IEC 61010-1 for safety. 2. Electrical Specifications:	05

		DC Voltage Measurement: Range: 0 - 1000V Accuracy: ±(0.5% + 2 digits) AC Voltage Measurement: Range: 0 - 1000V Accuracy: ±(0.8% + 3 digits) Frequency Range: 45 Hz to 1 kHz DC Current Measurement: Range: 0 - 10A Accuracy: ±(1.0% + 3 digits) AC Current Measurement: Range: 0 - 10A Accuracy: ±(1.2% + 3 digits) Resistance Measurement: Range: 0 - 50 MΩ Accuracy: ±(0.9% + 2 digits) Capacitance Measurement: Range: 0 - 100 mF Accuracy: ±(1.9% + 3 digits) Frequency Measurement: Range: 0 - 100 MHz Accuracy: ±(0.1% + 3 digits) Temperature Measurement: Range: -40°C to 1000°C Accuracy: ±(1.0% + 2 digits) 3. Additional Features: True RMS Measurement: Required for AC measurements. Auto-ranging: Automatic selection of measurement range. Data Hold: To freeze the current reading on the display. Min/Max Recording: Captures minimum and maximum values. Diode Test: For testing diode functionality. Continuity Test: Audible indication for continuity. Backlit Display: For visibility in low light conditions. Safety Rating: CAT III 1000V / CAT IV 600V. 4. Physical Specifications: Display: LCD, minimum 4 digits. Power Supply: Battery-operated, with low battery indicator. Dimensions: Compact and handheld size. Weight: Lightweight for ease of handling. Operating Temperature Range: 0°C to 50°C Storage Temperature Range: -20°C to 60°C 5. Accessories: Test Leads: High-quality, rated for the voltage and current ranges specified. Protective Case: Durable carrying case for protection and portability. Temperature Probe: For temperature measurements. User Manual: Comprehensive manual for operation and troubleshooting. Calibration Certificate: Traceable to national/international standards. Calibration Services: Details of calibration services provided post-purchase.	

04	FUSE and MCB Characteristic Trainer	**TECHNICAL SPECIFICATIONS:** **Analog Meters:** • Voltmeter 300V AC • Ammeter 2A DC **Power supplies:** • Power Supply 230V Mains • Operated on Mains power 230V, 50Hz ±10% **Components are mounted on the panels are:** • Fuse With Protection Cover • Lamp Load 4 Bulbs Controlled With Individual Switches. • 2A Variac. **SALIENT FEATURES:** • Light Indicator for Mains. • Front panel built with high class insulated Printed Bakelite/Aluminum Board sheet with well printed circuits and symbols. • MCB for Short Circuit protection • Instruction manual. • Connections are brought out through 4mm Colored Safety Sockets. • Patch Cords 4mm. •The trainer is housed in Metal cabinet. •Size of the trainer set 12x18” **OPTIONAL ACCESSORIES:** • NO	01
05.	Teaching Setup for FUZZY Logic based control	Should have following features – • PC (VWB) based Fuzzy Logic Controller. • Facility to monitor behavior of the controller output (Un) & process variable (MV) either on PC screen or on CRO. Settable time constants. • Graph printing facility for laboratory journal entries. • Can learn about different processes using simulated building blocks as well as real life processes using replaceable experiment panels/processes and built in sqr. / trig. / sin, Function Generator as disturbance. • Aesthetically designed injection molded electronic desk (master unit) carrying useful experiment resources like Power supplies, DPMs, Computer Interface, Analog PID controller with central slot to hold various replaceable experiment panels / processes. • Connection through sturdy 4mm Banana sockets & Patch cords. • Useful for Post Graduate projects and research purpose. • Students Workbook & Instructor's Guide provided with each unit. Should have a Master Unit with Swappable Slot for experimentation panels: - • Built in Power Supply : DC supply +12V, 500mA. 1-ph. sine reference for cosine firing 30Vpp. max. 17V DC, 500 mA unregulated for driving pulse X'mer, Variable DC power supply : 7 to 14V/3A.	01

		• Display : A) DPM-2Nos., for Temp upto 100 C/500 C; B) Analog Meter - 2Nos. i) Centre zero for display of process error (+9V) ii) For MV/SP(0-2.5V) • Operating voltage : Switch selectable 220-240Vac, +10%, 50Hz, 75VA. • Fuzzy software Controller : Elegantly designed GUI of realistic fuzzy controller with bar-chart, numeric display for controller output, set point & measurable variable in % with parameter like set value Rn (0-99.9), Sampling Time Ts (0.1-99.9), Error (0.1-99.9), Error dot (0.1-999), Fuzzy output Upper Limit Uh (0-99.9) & Lower Limit UI (0-99.9), Facility to set units; Software should be LabVIEW based. for output viz. Percentage (%), " C, RPM, Voltage (V), mm, LPH, Kg/cm . Facility to set inbuilt FG (Square/Triangle/Sine) as set Point. • Process Monitoring Mode: Drawing graphs of analog data presented at CH 0 & CH1 of computer Interface. Cursors for X & Y axis for • measurement & online graphs savings for reproduction. • Fuzzification Mode : Fuzzy controller based on linguistic rules & rule matrix (knowledge base), Calculation of N,Z,P, and membership function. • Defuzzyfier : Calculation of strength of LH, MH, HH & crisp output weighted average. • **Computer Interface Adapter / CIA**: Optoisolated Adaptor to prevent damage to PC parallel port (25 pin LPT) due to wrong connections. Interfaces through 25 pin M to F cable 1 mtr Length, 4 ADC channels: 0 to 2.5V full scale, 1DAC channels: O/p 2.5 VFS. • USB converter to interface 25 pin D connector on CIP panel to USB using microcontroller module enclosed in 25 pin D shell using Type A to mini-B cable. **Modular experiment panels:** Servo Interface panel (SIP) / CE3: • Functional blocks for Lag (2No), Integrator (2No), Transport Lag (1No), Gain (1No), Buffer/error block (No) for constructing simulated Type 0,1,2,3 & 1st, 2nd, 3rd Order processes to work under fuzzy control. • Fast (10mS) & slow (1sec) mode selection for all processes to observe response on either CRO or PC using CIA. • Level shifters (2No) 0-2.5V to +9V to match voltage levels of PC (2.5V). • Control Interface circuit for AC & DC servo motor, signal conditioning circuit for speed sensor to O/P 0 - 2.5VDC (2500RPM) with speed direction. • Temp/Light panel: Process box containing 3 high wattage (60W) bulbs under aluminum	

		plate heater. Builtin fan, lamp as disturbance generator. Sensor: RTD for temperature control upto 100 C with built in CAL facility, Photodiode for light intensity control upto 2000lux. • DC Servo Position Control panel: servo Amplifier with built in 12V/3A power supply. Sensor: Photo reflective speed sensor with direction detect using 2 pairs of photo emitter detector giving Quadrature o/p's, servo pot position feedback.	

2. The tenderers fulfilling the required criteria as mentioned may download the tender document from the websitehttps://eprocure.gov.in/eprocure/app and submit online as per the schedule given below. However, the tender documents can also be viewed in the website of the University www.tripurauniv.ac.in.

Date and time of tender publication in the websites.	20-01-2025 at 4.00 PM
Date and time for closing of submission.	08-02-2025 at 12.00 PM
Date and time for opening of technical bid document.	10-02-2025 at 1.00 PM
Date and time for opening of financial bid.	11-02-2025 at 12.00 PM

SECTION- II

General Terms & Condition

General Terms & Condition

1. **Scope of Work:** Scope of work covered under this includes supply, transportation and installation at the Department of Electrical Engineering, Tripura University Suryamaninagar;
2. **Qualifying requirements:** The bidder must either be a manufacturer or authorised dealer having credential of supplying and installation of above-mentioned items.
3. **An amount Rs.1,000.00 (non-refundable cost of tender fee) in the form of Demand Draft in favour of *Finance Officer, Tripura University* on State Bank of India payable at Tripura University Campus Branch. Photocopy of the same is to be uploaded along with the tender documents and original DD may be deposited to Tripura University through post or by hand in the office of the Finance Officer *on or before of submission of Technical Bid.***
4. **EMD: An amount Rs.20,000.00 (Refundable) in the form of Demand Draft in favour of *Finance Officer, Tripura University* on State Bank of India payable at Tripura University Campus Branch. Photocopy of the same is to be uploaded along with the tender documents and original DD may be deposited to Tripura University through post or by hand in the office of the Finance Officer *on or before of submission of Technical Bid.***
5. **Warranty and Support: Warranty: Minimum 2 years warranty on the instrument after satisfactory installation**.
6. Technical Support: Availability of technical support and service center information.
7. **Forfeiture of EMD**: The Earnest Money is liable to be forfeited in the event of (a) withdrawal of offer during the validity period of the offer, (b) non-acceptance of orders when placed, or (c) Non confirmation of acceptance of orders within the stipulated time after placement of offer, (d) Any unilateral revision made by the bidder during the validity period of the offer.
8. **Rate:** The bidder should quote the rate in Indian Currency i.e. INR and such rates are FOR destination basis i.e. at the site of Tripura University, Suryamaninagar-799022. Bidders are required to quote their rate exclusive of taxes, Government Taxes will be paid as per prevailing Government rules at the time of payment.
9. **Time for Completion**: Delivery and installation of the items must be completed within 21 (Twenty-One) days from the date of issue of purchase order.
10. **Payment Terms**: 95% Payment will be made after satisfactory completion of delivery, 5 % of invoice value will be retained as performance guarantee, and the same will be released after 02(Two) year from the date of delivery and installation. Quotations for part items shall not be entertained.

11. The contract shall be governed by the Laws and Procedures established by the Government of India and subject to exclusive jurisdiction of competent Court and Forum in Agartala only.

12. Payment will be made strictly through RTGS/NEFT/Bank Transfer.

13. **Note**: Tripura University reserves the right to reject any/all the quotations without assigning any reason thereof for the interest of the University and lowest rate may not be the only criteria for selection of the bid.

SECTION - III

INSTRUCTIONS TO BIDDERS

Tripura University (A Central University), Suryamaninagar, Agartala, Tripura invites E-tenders for: **"Subject:** Supply and Installation of Equipment's for the Department of Electrical Engineering" as per details given in the tender document uploaded onhttps://eprocure.gov.in/eprocure/app.

The offers, in the prescribed format, shall be submitted online at https://eprocure.gov.in/eprocure/appas per the tender document. No tender will be accepted in hard copy, fax, e-mail or any other such means. The intending bidders must be registered with e-tender website https://eprocure.gov.in/eprocure/app.

The tender document is also available on Tripura University (A Central University) website: **https://www.tripurauniv.ac.in/** for reference and viewing only but not for submission. **However, for the purpose of submission, the website**https://eprocure.gov.in/eprocure/app**should be referred to NIT (notice inviting tender).**

Instructions for Online Bid Submission:

The bidders are required to submit soft copies of their bids electronically on the e-tender Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the e-tender Portal, prepare their bids in accordance with the requirements and submitting their bids online on the e-tender Portal.

More information useful for submitting online bids on the e-tender Portal may be obtained at: https://eprocure.gov.in/eprocure/app.

REGISTRATION

Bidders are required to enroll on the e-Procurement Portal (https://eprocure.gov.in/eprocure/app.

1. with clicking on the link "**Online bidder Registration**" on the e-tender Portal by paying the requisite **Registration fee through online banking.**
2. As part of the enrolment process, the bidders will be required to choose a unique user name and assign a password for their accounts.
3. Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication with the bidder.
4. Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate **(Only Class III Certificates with signing + encryption key usage)** issued by any Certifying Authority recognized by CCA India (e.g.Sify/ TCS/ nCode/ eMudhra etc.), with their profile.
5. Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC's to others which may lead to misuse.
6. Bidder then logs in to the site through the secured log-in by entering their user ID/password and the password of the DSC/ e-token.
7. The scanned copies of all original documents should be uploaded on portal**.**

Annexure I

All the documents mentioned should be submitted/uploaded in the Central Procurement Portal

Technical Bid

Sl No	Particulars	
1	Name of the Bidder / Firm / Agency / Vendor	
2	Address of the Bidder/Fire/Agency/ Vendor	
3	PAN and GST Registration along with upto date GST clearance certificate in his/her own name issued by the competent authority (Copies to be submitted)	
4	Experience certificate/Work order supporting execution of similar works put to tender (Copies to be submitted)	
5.	EMD (Refundable) Amount …… Transaction No…… Dt. …….. Name of the drawing Bank ……	
6	Cost of Tender Document (Non Refundable) Amount …… Transaction No…… Dt. …….. Name of the drawing Bank ……	

Declaration by the Bidder/ Firm/Agency/Vendor

I/we am/are submitting my/our best our in response to your NIT vide No …… Dated…….. For further course of evaluation. I/We have gone through the terms and conditions as mentioned and understood properly without any short of ambiguity. Therefore, all the informations given by me/us are true to the best of my/our knowledge and belief. I/We bind myself/ourselves for compliance of all the terms and conditions as mentioned if the work is offered.

Signature of the Bidder/Firm/Agency/Vendor with seal