



तेजपुर विश्वविद्यालय / TEZPUR UNIVERSITY

(संसद के अधिनियम द्वारा स्थापित केंद्रीय विश्वविद्यालय)

(A Central University established by an Act of Parliament)

कुल सचिव का कार्यालय/ OFFICE OF THE REGISTRAR

नपाम :: तेजपुर - 784028 :: असम

NAPAAM :: TEZPUR - 784028 :: ASSAM

SHORT QUOTATION NOTICE

TU/11-24/Pur/Qtn/2015/5073-A.dated:- 14.03.2016.

Sealed quotations are invited from reputed manufacturers/authorized dealers/vendors for supply, installation & commissioning of following equipment required for the Power System Laboratory of B.Tech in Electrical Engineering Programme under the Department of Eelectronics and Communication Engineering, Tezpur University.

Sl. No.	Items/Equipment	Specifications
1	<p>Trainer Kit to study:</p> <p>(i) The performance of a long transmission line under no load and under light load condition.</p> <p>(ii) The performance of a long transmission line under load at different power factors.</p> <p>(iii) The ABCD and hybrid parameters of given transmission model.</p> <p>(iv) To study Ferranti effect and voltage distribution in H.V. long transmission line using transmission line model.</p>	<p>Mains Supply: 230V \pm10%, 50Hz</p> <p>Single Phase Variac Input: 230V Output: 0-270V Current: 0-2A</p> <p>Display Measurement Voltage: \geq25V Current: \geq0.2A Active Power: \geq20W \leq2000W Reactive Power: \geq20VAR \leq2000VAR Apparent Power: \geq20VA \leq2000VA</p> <p>Loads Resistor: 700Ω/100W Inductor: 800mH/0.5A Capacitor: 12.5μF/450V LCD Display Simultaneous display of sending and receiving parameters High Resolution ADC for accurate measurement Inbuilt Single Phase Variac to regulate supply Facility to configure Short, Medium and Long Transmission Line using multiple value of R, L and C Adequate patch cords for interconnections. Equipped with supply indication lamps.</p> <p>All safety measures to be considered. Training Panel should have circuit diagram printed on board and safety terminals. A Manual detailing all calculations to be supplied along with the setup.</p>
2	<p>High Quality Trainer Kit for Radial and Ring Main Distribution System.</p>	<p>Separate connection for Radial & Ring Main System Mains supply: 230V \pm 10%V AC, 50Hz Inbuilt Isolated DC Output Supply: Rated Voltage: 0 – 220V \pm 10% (Variable); Rated Current: 2A Single Phase Transformer: Rating: 0.5kVA, Primary voltage: 230V, Secondary voltage: 150V Single Phase Variac: Input: 230V, Output: 0 – 270V; Current: 2A Digital DC Voltmeter (3 Nos.): Range: 20 – 500V, Display Resolution: 1V Digital DC Ammeter (3 Nos.): Range: 0 – 5A, Display Resolution: 0.01A</p>



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		<p>MCB: 2A (SPN) Isolation transformer for safe operation Equipped with inbuilt lamp load holders Adequate patch cords for interconnections All safety measures to be considered. Training Panel should have circuit diagram printed on board and safety terminals. A Manual detailing all calculations to be supplied along with the setup.</p>
3	<p><i>Trainer kit to measure:</i> <i>(a) Direct axis and quadrature axis reactance of synchronous machine.</i> <i>(b) To determine positive, negative and zero sequence reactance of an alternator.</i></p>	<p>Mains Supply: Three Phase, 415V±10%, 50Hz DC Power Supply Input Mains: 230V AC, 50Hz Fixed DC output: 200V Variable DC output: 0 – 200V Machines Specification (2 nos.) Both the Machines are flexibly coupled and mounted on “C” channel base. DC Machine Type: Shunt Rating: 2HP Voltage Rating: 200V Speed: 1500 RPM (no load) Insulation: Class “B” Three Phase Synchronous Generator Type: Star Connected Voltage Rating: 415V Rating: 3HP Speed: 1500 RPM (no load) Excitation Voltage: 120V Insulation: Class “B” Auxiliaries required: Rheostat: 2.8A, 220V Three Phase Variac: 415V, 10A, closed type DC Voltmeter: 300V DC Ammeter: 10A, 5A AC Voltmeter: 500V/20V AC Ammeter: 10A, 2A MCB (TPN): 10A Digital Tachometer: (0 – 3000) RPM, contact-type Fitted with 3-point starter Adequate patch cords for interconnections. Equipped with supply indication lamps Electrical Loading Arrangement Flexible Shaft Coupling Arrangement Heavy Duty Base/Channel Separate terminals for rheostat are to be provided on the control set-up. All safety measures to be considered. Training Panel should have circuit diagram printed on board and safety terminals.</p>



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4	Setup to determine the breakdown strength of the given transformer oil.	Fully motorized high voltage control Break down voltage protection Over current protection Mains & H.T. "ON" & "OFF" Switches Should have automatic tripping mechanism Designed by considering all the safety standards Mains and H.T. "ON" indications Test cup with adjustable gap electrode arrangement Mains Supply: 230V AC $\pm 10\%$, 50Hz Single Phase Variac: 230V/0 – 270V High Voltage Source: 80kV, 20mA HV Control Motor for smooth Motorized operation Type: Servo; RPM: 500 (No Load) Voltmeter: 0 to 100kV Electrode: Suitable size of electrode with adjustable gap to be provided. All safety measures to be considered.
5	Trainer kit to determine location of fault in a cable using cable fault locator.	Cable Fault Locator Study: 1) Telephone cable simulator module 2) Wheat stone bridge circuit Telephone Cable Simulator Module: <ul style="list-style-type: none">• It should consist of 10 meter cable module with different intermediate points.• Separate two sections to be provided (each 5 meter).• 1 ohm per meter for each sub division.• Necessary fault creating points are to be provided.• Ground and short circuit fault calculation using Loop Test. Wheat Stone Bridge Circuit: <ul style="list-style-type: none">• Four arms with one unknown arm to connect the unknown resistance (Cable fault resistance).• Two range selection arms to provide to select the nearest range of unknown value.• Range of Measurement: 50 Ohm-1M Ohm.• One no. of galvanometer to provide to indicate the balance conditions• Built-in power supply• 230V AC input, all are mounted in a nice cabinet
6	Trainer kit to determine fault current for L-G, L-L, L-L-G, L-L-L, L-L-L-G faults at the terminals of an alternator at very low excitation.	To determine practically the various types of faults in transmission line. <ul style="list-style-type: none">• Line to Ground (L-G) Fault analysis of Single Phase Transmission Line• Single Line to Ground (L-G) Fault analysis of Three Phase Transmission Line• Line to Line (L-L) Fault analysis of Three Phase Transmission Line• Double Line to Ground (L-L-G) Fault analysis of Three Phase Transmission Line• Symmetrical L-L-L Fault analysis of Three Phase Transmission Line• Symmetrical L-L-L-G Fault analysis of Three Phase Transmission Line



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		<p>Input Supply: 0- 415V AC $\pm 10\%$, 50Hz Auxiliary Supply: 0-230V AC $\pm 10\%$ Three Phase Transformer Rating: 1kVA Primary Voltage: 415V AC (Line Voltage) Secondary Voltage: 240V AC (Line Voltage) Potential Transformer Primary Voltage: 240V AC Secondary Voltage: 18V AC Current: 500mA Current Transformer Ratio: 1:1 and 1:2500 Current: 5A and 20A Operating Voltage: 30V Fault Current: 5A Meters Used Voltmeter: 500V AC Ammeter: 5A AC MCB: 10A Accessories: Three Phase closed type Variac: 415V/10 A. Digital Storage Oscilloscope: 100 Mhz, 1GSPS, 4 channel Fast response time High quality meters Test terminals provided to analyze the waveforms Line Voltage and Phase Voltage selection facility Adequate patch cords for interconnections Equipped with supply indication lamps All safety measures to be considered. Training Panel should have circuit diagram printed on board and safety terminals. A Manual detailing all calculations to be supplied along with the setup.</p>
7	Setup to study the IDMT over current relay and determine the time current characteristics.	<p>Mains Supply: Three Phase, 415V $\pm 10\%$, 50Hz Auxiliary Supply: 230V $\pm 10\%$, 50Hz Display Measurements Current Input: $>100\text{mA}$ Time Accuracy: 1 Second Over Current and Earth Fault Relay Input Current: Suitable for CT Secondary 5A (or) 1A Pick up: Within 1.1 times of set value Reset value: 90% to 95% of pickup Auxiliary Supply: 18-250V AC/DC MCB (TPN): 10A Four element (Three Phase + Earth Fault) Non-Directional Over Current IDMT/DMT Numeric Relay Numeric Relay provided with Curve's Selection Facility: Normal Inverse, Very Inverse, Extremely Inverse, Long time Inverse and Define Time Compatible for Internal calculation of zero sequence current under earth fault</p>



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		Large Font LCD for input current and tripping time display Provided with Current Injection Source Microcontroller based Numeric Relays Demonstration Adequate patch cords for interconnections Designed by considering all the safety measures Diagrammatic Representations for the ease of connections
8	Setup to study percentage differential relay.	Mains Supply: 230V AC $\pm 10\%$, 50Hz Single Phase Variac Input: 230V AC Output: 0 - 270V AC Current: 2A Single Phase Transformer Input: 230V AC Output: 24V AC Current: 3A Alphanumeric Big Font LCD display Electromechanical relay to understand internal mechanism and its working Inbuilt Single Phase Variac with isolation Two variable current injection units Tripping function settings Adequate patch cords for interconnections Equipped with supply indication lamps All safety measures to be considered. Diagrammatic representation of relay connection in transmission line to be provided.
9	Test Set up to determine the partial discharge level of the given distribution transformer as a function of voltage.	Partial Discharge Smart Electrical Test System A multi-application partial discharge (PD) analyzer especially designed for day-to-day field use, should be rugged and easy-to-handle having applications to include cable, transformer, rotating machine and switchgear testing with capability for both on-line and off-line measurements
10	Test Set up for Dissolved Gas analysis given transformer oil sample	Portable Transformer Oil Dissolved Gas Analyzer, capable of quick measurement of at least 7 key fault gases and moisture and it should have ISO Certification.
11	ETAP 14.1 version software	5 Users Education Concurrent (Network) License without USB To measure direct axis and quadrature axis sub transient reactance of synchronous machine. To obtain steady state, transient and sub-transient short circuit currents in an alternator. To study impedance relay, MHO relay and reactance type distance relays.

GENERAL TERMS & CONDITIONS:

1. No separate tender paper will be issued from the office; one should only download the specifications/List from the website.
2. **The rates should be preferably quoted in Indian Rupee and FOR Tezpur University, Napaam basis. Charges for clearing and transportation should be incurred by the supplier.**
3. *Quotations should be accompanied by i) An EMD (in the form of Demand Draft/Call Deposit/TDR) of ₹. 5,000/- (Rupees Five Thousand) only drawn/pledged in favor of Registrar, Tezpur University, payable at Tezpur. No request for consideration of earlier deposited EMD will be considered. ii) A non refundable application*



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(quotation) fee of ₹.1000.00 (Rupees One Thousand) only have to be paid only by Demand Draft drawn in favour of Registrar, Tezpur University payable at Tezpur.

4. The rates should be exclusive of taxes and applicable tax % should be clearly indicated.
5. Quoted rates should be valid at least for a period of 01 year.
6. The rates should be quoted along with supporting documents of specifications and technical features and list of users.
7. The system must be installed at the laboratory, and after installation a basic training/demonstration must also be provided by the supplier or their Indian counterpart without any additional costs.
8. All the quotations must be accompanied with supporting documents and / or literature.
9. Demonstration may be sought from the vendors for authentication of quoted specification.
10. Details of availability of after sales support will have to be furnished. After sales support directly from manufacturer and from Assam (Guwahati / Tezpur) will be preferred.
11. The University is exempted from paying Custom and Excise duty.
12. Proprietary items should be quoted with sole Manufacturer/Distributorship certificate.
13. Warranty/Gurantee period should be specifically mentioned in the quotation.
14. No Advance payment will be made. However, for foreign supplier, advance payment will be made either by FDD/Wire Transfer/LC. In such cases 10% Performance Bank Guarantee should be submitted before issuing FDD/Wire Transfer/LC, covering the warranty period.
15. Performance Bank Guarantee also has to be submitted for Major equipments of Indian origin, covering the warranty period.
16. Items of Foreign origin should have Insurance up to installation on site.
17. The University reserves the right to accept or reject any or all the quotations without assigning any reason.
18. Quoted price should be inclusive of essential accessories and should be CIF Tezpur University, Tezpur
19. Applications for release of EMD should be submitted to the Registrar/ Deputy Registrar.
20. Apart from the above terms and conditions the University has the right to include any other terms and conditions as and when felt necessary.
21. **Quotation should be submitted in the DROP BOX placed in the reception of the Administrative Building of the University latest by 21.03.2016 (3.00 pm).If posted/couriered, should reach within the last date addressed to "The Deputy Registrar (GA), Tezpur University". The Quotation Notice No. and date should be clearly superscribed in the the envelope/packet containing the quotation.**

Sd/-Deputy Registrar (GA)
Tezpur University