Ahmedabad Institute of Technology
Ahmedabad
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TENDER

'Ahmedabad Institute of Technology' under the auspice of 'All India Council for Technical Education', under its scheme for MODROB, invites tender from competent suppliers / manufactures for the items listed below for modernization of its **'Protection and Switch Gear Lab'** of Electrical Engineering Department:

Sr.No.	Item	Quantity
1	**Radial and Parallel Feeder Protection study unit**	**1**
2	**Generator Protection simulation study unit**	**1**
3	**Transmission line and its protection study unit**	**1**
4	**Relay testing kit (Electromechanical Over current relay test kit)**	**1**
5	**Percentage bias differential relay study kit**	**1**
6	**Negative sequence solid state current relay kit**	**1**
7	**CT & PT testing units**	**1 Each**

Competent and interested suppliers of above equipments may collect the tender forms from college office up to 03:30 P.M. every day or may directly download form from college web-site (www.aitindia.in). Last date for submission of tender, complete in all respect, in sealed cover, to Registrar, 'Ahmedabad Institute of Technology' is within 15 days from publication in news paper.
Right to reject any or all the tenders received without assigning any reason is reserved. Tender form fee in case for each item is quoted is Rs. 50/- and Earnest money by way of D.D. (Refundable) as shown in Tender form is to be submitted in name of 'Ahmedabad Institute of Technology' along with Tenders in sealed covers.

Principal

Ahmedabad Institute of Technology
Tender Form
Purchase of Equipments under MODROB scheme

1. Name of Item / Equipment:	Radial Feeder and Parallel Feeder protection study unit
2. Specifications:	Fault simulation having minimum of 4 zone of protection 3 phase input/ output transformer, 415 v/ 66-33-11 volt Resistive load kit Microcontroller based over current relay L & T make Programmable relay function with RS 485 port, software to display the parameter in PC Panel with CT & PT Microcontroller based time-interval meter Digital Panel meters using DSP based microcontroller power analyzer, built in circuit breaker, illuminated push buttons
3. Approx. Cost:	Rs. 3,50,000/- per unit
4. Earnest Money (Refundable):	Rs. 3500/-
5. Last date of delivery:	
6. Remark:	The supplier has to install and give trial operation with all the operating manuals containing circuit diagrams and test procedures at our premise.
7. Warranty period:	1 year from the day of installation/ trial operation

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Tender Form
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1. Name of Item / Equipment:	**Generator protection simulation study unit**
2. Specifications:	Three phase generator protection using numerical type power system relays. Three phase alternator motor set-up with digital dc drive Power System relays Meter panel with loads A. **2 set of 3 phase alternator motor sets with digital dc drive:** **Alternator: 1 KVA salient pole type 415 V, 50 Hz, 1500 RPM, excitation voltage: 200 V DC.** **DC Shunt Motor: 2 HP, 1500 RPM, 200 V at 8 Amp.** **Field supply 200 V DC at 0.8 Amp.** **Both Alternator and Motor are coupled with base plate DC drive for both alternator field and motor armature, field voltage (i) 0-200 V DC output at 1 Amp for alternator 1 field voltage with digital ammeter and voltmeter. (ii) 0-200 V DC at 1 Amp for motor-1 field voltage with digital ammeter and voltmeter. (iii) 0-200 V DC at 8 Amp for motor-1 armature with digital ammeter and voltmeter. (iv) 0-200 V at 1 Amp for alternator-2 field with digital ammeter and voltmeter.** B. **Power system relays:** **Numerical o.c. 3 phase relay + earth fault relay L & T make or equivalent.** **Numerical percentage differential relay – L & T make or equivalent.** **Numerical over voltage / under voltage relay- L & T make or equivalent.** Static negative sequence relay- L & T make or equivalent. Microcontroller reverse power relay- Alstom or equivalent. Microcontroller synchronous relay/ rotating type digital indicator- L & T make or equivalent. Numerical over /under frequency relay Suitable CT & PT with all relays In built event record, display parameter Fault simulation switches C. **Meter panel with load** **Power analyzers DSP based meters / digital meters.** **One number three phase lamp load with selector switch- 2 KVA**
3. Approx. Cost:	Rs. 3,25,000/-
4. Earnest Money (Refundable):	**Rs. 3250/-**
5. Last date of delivery:	
6. Remark:	The supplier has to install and give trial operation with all the operating manuals containing circuit diagrams and test procedures at our premise.
7. Warranty period:	1 year from the day of installation/ trial operation

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1. Name of Item / Equipment:	Transmission line and its protection study unit
2. Specifications:	**Simulation & study the protection schemes of transmission line for various fault conditions** (i) Bench model of 1 phase artificial transmission line No. of pi sections: 5 Voltage: 55/110/220 V Current: 4 Amp Short circuit current: 10 Amp Each Pi section of 80 kms Link simulation through air cored inductor (ii) Power transformer (Generating station) Input voltage: 110V; 1 phase; 50 Hz Output voltage: 55/110/220 V Current: 4 A, with tap changing switch for voltage regulation (iii) Power transformer (Receiving end) Input voltage: 55/110/220 V, 1 phase, 50 Hz Output voltage: 220 V; 3 phase, 50 Hz Current Rating: 4 A with tap changing switch for voltage regulation Protection relays: (i) Single element impedance relay (ii) Over current relay + Earth fault relay **Meters:** **2 Nos. of 3 phase power analyzer DSP based for display of V, I, PF, Hz, KW, KVA, KVAr, KWH** **1 No. power analyzer- open ended connection time interval meter for trip time measurement 0.0001 sec accuracy.** **Load:** **R-L-C load to load up to 75 % of load regulation and 85 of p.f. lag** **Selector switch for R,L,C load**
3. Approx. Cost:	**Rs. 2,70,000/-**
4. Earnest Money (Refundable):	Rs. 2700/-
5. Last date of delivery:	
6. Remark:	The supplier has to install and give trial operation with all the operating manuals containing circuit diagrams and test procedures at our premise.
7. Warranty period:	1 year from the day of installation/ trial operation

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1. Name of Item / Equipment:	Relay testing kit (Electromechanical over current relay test kit)
2. Specifications:	Make of Relay: English Electric (Alstom) / Easum Reyrolle C.T. SEC: 1 A or 5 A, Non directional relay Plug setting: 50 % - 200 % Time Multiplier setting: 0.1 – 1 Output: 8 A Characteristics: 3 sec – 10 times Auxiliary supply: self powered The relay confirms to error class index E 7.5 as per BSS 142-1966 and IS: 3231-1965 at ten times reference current setting Relays fully comply IS 3231-1965 Suitable for normal tropical conditions
3. Approx. Cost:	Rs. 1,00,000/-
4. Earnest Money (Refundable):	Rs. 1000/-
5. Last date of delivery:	
6. Remark:	The supplier has to install and give trial operation with all the operating manuals containing circuit diagrams and test procedures at our premise.
7. Warranty period:	1 year from the day of installation/ trial operation

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Tender Form
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1. Name of Item / Equipment:	Percentage bias Differential Relay study kit
2. Specifications:	Static percentage differential relay study kit consists of (i) Static percentage differential relay (ii) Relay set-up with meter One number static percentage differential relay L & T or equivalent CT secondary current 1 A or 5 A Percentage setting range: 10-50 percent in steps of 10 percent, 2 biased inputs 2 nos.– 3(1/2) digit ammeter 2 nos. – variable current source 1 no. – Automatic relay tripping time measurement circuit 1 no microcontroller based time interval meter with display 1 no. ON Push button 1 no. OFF Push button Elcon or equivalent NO and NC outputs Internal / External time internal meter selectable Relay NO/NC connection facility Built in auxiliary power source
3. Approx. Cost:	Rs. 90,000/- per unit
4. Earnest Money (Refundable):	Rs. 900/-
5. Last date of delivery:	
6. Remark:	The supplier has to install and give trial operation with all the operating manuals containing circuit diagrams and test procedures at our premise.
7. Warranty period:	1 year from the day of installation/ trial operation

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1. Name of Item / Equipment:	Negative sequence solid state current relay kit
2. Specifications:	CT sec: 1 A or 5 A Negative phase sequence current 10 % or 20 % or 30 % DMT: 3, 6 and 9 sec Output: 0.5 sec, 7500 KVA with max 30 A and 550 V ac or dc Auxiliary power supply: Resetting voltage: 90 % or more of the voltage Ambient temp: 27^{o} C +/- 2^{o}C Frequency: 50 Hz- 0.5 % Pick up current: +/- 10 % Time error at all settings: +/- 10 % Impulse voltage: as per IEC 255-5/158686-1977 Make of relay: English Electric or equivalent
3. Approx. Cost:	Rs. 65,000/-
4. Earnest Money (Refundable):	Rs. 650/-
5. Last date of delivery:	
6. Remark:	The supplier has to install and give trial operation with all the operating manuals containing circuit diagrams and test procedures at our premise.
7. Warranty period:	1 year from the day of installation/ trial operation

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1. Name of Item / Equipment:	(i) Current Transformer Testing unit (ii) Potential Transformer Testing unit
2. Specifications:	(i) CTs testing set: Determination of phase angle error and ratio error of CT rated 5 A or 1 A with burden box. Ratio error in percentage and phase angle error are directly displayed. Phase angle error: 0 +/- 400 min – auto range Ratio error: 0 +/- 10 % auto range CT polarity: Directly displayed on LCD Injected current display Secondary Voltage selector switch Terminals to connect transformer and burden box, transformer under test Standard current transformer: 100-75-50-25-10 & 5 Amp Secondary: 5 A or 1 A via BTI connecter Accuracy: 0.2 % Burdon Box: Range: 40 VA, in steps of 2.5 VA, 0.8 pf lag Range: 1-2.5-3.5-3.75-5 VA selectable, unity pf Polarity check facility of current transformer under test Magnetization check facility Input: 230 V, 50 Hz single phase Output: 0-2000 V Digital voltmeter for output voltage and digital ammeter for leakage current. **PT Testing set:** Determination of phase angle error and ratio error of PT rated:110/3 V Ratio error in percentage and phase angle error are directly displayed. Phase angle error: 0 to +/- 20 min, 0 to +/- 100 min, 0 to +/- 400 min ranges Ratio error: 0 to +/- 0.5 %, 0 to +/- 2.5 %, 0 to +/- 10 % ranges Range selecting switch: Terminals for connection of potential transformer, standard potential transformer and burden box, Polarity check indicator Null detector with sensitivity control Power supply for null detector Voltmeter to indicate injected voltage Ratio error and phase angle error calibrated dials Secondary voltage selector switch
3. Approx. Cost:	Rs. 2,75,000/-
4. Earnest Money (Refundable):	Rs. 2750/-
5. Last date of delivery:	
6. Remark:	The supplier has to install and give trial operation with all the operating manuals containing circuit diagrams and test procedures at our premise.
7. Warranty period:	1 year from the day of installation/ trial operation