

GOVERNMENT OF TRIPURA
EDUCATION (HIGHER) DEPARTRTMENT
TRIPURA INSTITUTE OF TECHNOLOGY, NARSINGARH, TRIPURA (WEST)
NOTICE INVITING TENDER

Dated: 13/07/2015

NIT NO. 01/TIT/EE/ELECTRIC DRIVES/2015-2016

Sealed item rate tender is hereby invited on behalf of the Governor of Tripura from the manufacturers/ authorized dealers/ distributors/reputed firms having experience for supplying the followings up to 14/08/2015 up to 4:00 PM. The tenders will be opened on the same day, if possible.

Sl. No.	Name of Work	Estimated Cost	Earnest money	Cost of Tender Form	Date of Selling of Tender Form	Last Date of Receiving Tender	Time for Completion
1	Supplying , testing & Demonstration of Laboratory Equipments for Electric Drives Laboratory of Electrical Engineering Department of Tripura Institute of Technology, Narsingarh, Tripura (West).	Rs.7,40,000/- (Rupees Seven Lakhs forty thousands)	Rs. 7,400/-	Rs. 500.00	W.e.f. 17/07/2015 to 3:00 PM of 13/08/2015	14/08/15 at 3:00 PM	90 (Ninety) Days

TERMS AND CONDITIONS:-

Earnest money should be deposited in the form of **Deposit at call/ Deposit receipt / Bank Demand Draft / Bank Guarantee (at bidders option)** of any schedule bank guaranteed by Reserve Bank of India. Tender forms including terms and conditions can be had from the office of the Principal, Tripura Institute of Technology, Narsingarh, Tripura (West) w.e.f. 17/07/2015 to 13/08/2015 from 12:00 Noon to 3:00PM on any working day on payment of an amount of Rs. 500.00 (Rupees Five Hundred) only by Demand Draft (non-refundable) in favour of the Principal, TIT, Narsingarh and Payable at Agartala or by downloading from the website www.titagartala.nic.in. The bid forms so downloaded from above website shall accompany a Bank Draft of an amount Rs. 500/- for each bid in favour of the Principal, Tripura Institute of Technology, Narsingarh, Tripura (w), Pin: 799009 payable at Agartala .

Tender(s) may be sent through Registered Post /Speed post only or dropped in the tender box placed at the office of the Principal, TIT, Narsingarh within stipulated date and time mentioned above. The authority reserves the right to accept or reject any tender and to cancel the bidding process and reject all tenders at any time prior to the award of contract without assigning any reason there off.

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Signature of the Principal

Tripura Institute of Technology, Narsingarh

1. **Bid Price**

- a) Bidders are to quote price for the full /part package as indicated in Annexure “A”
- b) Contract may be made for the full/ part package as per the discretion of the purchaser. Correction, if any shall be made by Crossing out, dating, rewriting and initial signature.
- c) All duties, taxes (VAT) payable by the contractor under the contract shall be included in the total price **strictly as per format** (bill of quantities) and no conditional pricing should be made. **Details break up such as basic price, Taxes (VAT/ CST) as applicable etc. required to be furnished clearly against total price of each item. Nothing Extra will be entertained thereafter.**
- d) The rates quoted by the bidders shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.

2. Each bidder shall submit only one Tender.

3. **Validity of tender;**

Tender shall remain valid for a period not less than **90 days** after the deadline date specified for submission.

4. **Evaluation of Tenders ;**

The purchaser will evaluate and compare the tenders determined to be substantially responsive i.e. which

- (a) are properly signed and
- (b) conform to the terms and conditions and specifications

5. **Award of contract;**

The purchaser will award the contract to the bidder whose tender has been determined to be substantially responsive and who has offered the lowest evaluated quoted price.

- a. Notwithstanding the above, the purchaser reserves the right to accept or reject any tender and to cancel the bidding process and reject all tenders at any time prior to the award of contract.
- b. The bidder whose bid to be accepted will be notified for the award of contract by the purchaser prior to expiry of the tender validity period. The terms of the accepted offer shall be incorporated in the purchase order.

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6. Payment :-
 (i) Advance:- No advance Payment.
 (ii) On delivery :- No payment after delivery.
 (iii) On final acceptance :- 100% payment of the contract Price shall be paid to the supplier within 30 (thirty) days after the date of the acceptance for the respective goods.
7. Warranty / Guarantee shall be for a period of 01 (One) year as a whole . If normal commercial warranty/guarantee exceeds by 01 (One) year, then higher of the two as indicated shall be applicable to the supplied goods.
8. The bidders are to submit copies of the following documents duly signed by the Owner of the Firm or Authorized Person of the Owner of the Firm.
 (i) **PAN CARD** (ii) **STCC and (iii) PTCC of current validity or equivalent such as TAX/VAT documents / certificates which established or qualify as bonafied traders / suppliers.**
9. ***Brand Name / Model No. has to be mentioned wherever applicable along with the copies of authorization letter of the manufacturers / Distributorship or Dealership certificate (duly signed by the bidder or Authorized person of the bidder) from Manufacturers etc. in favour of the bidder. The bidder has to provide the Authorization Certificate if the bid document is signed by the Authorized person in favoure of the bidder.***
10. Tender has to be submitted along with Manufacturers' Original or downloaded brochure / catalogues duly signed by the bidder or his Authorized person, without which tender may be rejected at the discretion of the Authority.
11. **Earnest money deposit :-**
- 11.1 Earnest money Rs. @ 1% (Rs.7,400/-) of the estimated cost put to the tender shall be deposited in the State Bank of India or any schedule bank of India guaranteed by the Reserve Bank of India , in the shape of Deposit at call /Deposit receipt/ Bank Demand Draft / Bank Guarantee only drawn in favor of the Principal Tripura Institute of Technology, Narsingarh, Tripura (west) payable at Agartala must be submitted along with the Tender(s) failing which the tender(s) will be summarily rejected.

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- 11.2 The earnest money deposited by the successful bidder will not carry any interest and it will be dealt with as provided in the conditions stipulated in the tender.
- 11.3 The EMD shall be forfeited.
- (a) In 50%, if the Tenderer withdraws the Tender during the validity period of Tender.
- (b) In full, in case the supplier fails to start supply (or cannot show valid reasons which is acceptable to the authority) specified in the tender documents within 30th day or such time period as mentioned in letter of award after the date on which the Authority issues written orders to commence the work / supply.
12. Security deposit will be 10% of the contract value without any ceiling limit . The Earnest money of the successful tenderer deposited before issue of work / supply order will also form a part of security deposit. Security money will be deducted from Running Account bill(s) @10% (ten percent) of the bill(s) amount of the successful bidder till full Security Money is retained and will be retained up to “ defect liability period ” . As an alternative, **Bank Guarantee (BG)** from any Schedule Bank guaranteed by Reserve Bank of India may also be accepted as “ **Security Money** ” in question.
13. Supply, assembling, testing etc. of all equipment including others accessories shall be the responsibility of the contractor.
14. The contractor shall not be permitted to tender for works in Tripura Institute of Technology, Narsingarh responsible for award and execution of contract in which near relatives is posted in Accountant / as an Officer in any capacity between the grades of the Principal to Assistant Professor. He shall also intimate the name of persons who are working with him in any capacity or are subsequently employed by him and who are nearer relatives to any gazetted officer in the Tripura Institute of Technology, Narsingarh.
15. Confusions / errors, if any noticed need to be clarified / corrected from the Principal, Tripura Institute of Technology, Narsingarh prior to dropping of tender Any claim on such issues after dropping of tender will not be entertained.
16. The contractors should initial all correction if any, to rate(s) and items in the tender. The contractor should put his /her signature in every pages. Letters etc. found in the tender box of raising or lowering the quoted rates or dealing with any other points in connection with tender shall not be considered.

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17. The bidder shall seal the bid / tender in an envelope (for each work separately) addressed to the Principal, Tripura Institute of Technology, Narsingarh, Tripura(w) subscribing on it the Name of Work & DNIT/NIT No.
18. Tender(s) must be received in the office of the Principal, Tripura Institute of Technology, Narsingarh, Tripura(w) [employer] not later than the time and date given in the notice of invitation. If the specified date is declared holiday, tender(s) shall be received upto the appointed time on the next working day.
19. Tenderers shall not add or deduct any percentage after the totals have been worked out in an item rate tender. Such tenders shall be liable to rejection.
20. Sale Tax (VAT) or any other Taxes of materials in respect of his contract shall be payable by the contractor and the Government shall not entertain any claim whatsoever in this respect.
21. Before submitting tender, tenderers are to satisfy themselves by actual visit to the site of work / supply as regards the prevailing condition to approaches and roads and availability of labourers and materials etc. and the tenderers submitting tenders shall be deemed to have done so. No claim on the above account will be entertained after wards.
22. Any bid received by the Principal, Tripura Institute of Technology, Narsingarh, Tripura(w) [employer] after the deadline for submission of bid(s) will be summarily rejected and returned unopened to the bidder.
23. Supply order may be issued to the successful bidder(s) depending on the available sanctioned amount. Hence, quantity may be increased or decreased at the discretion of the authority during the time of evaluation of tender.
24. In addition to deduction of Income tax at source Tax (VAT/ CST) will also be deducted at source as per applicable rates from the bills of the contractor from running / final bill.
25. The contractors should quote in figures as well as in words the rates and amount tendered by them. The amount for each item should be worked out and requisite totals shall be given.
26. **Correction of Errors**
- a) The contractor shall quote the rates and amounts tendered by them **both in figures as well as in words**. The amount for each item shall be worked out and requisite totals shall be given.
 - b) Special care must be taken so that the rates and amounts are always written both in figures and words in such a way that interpolation is not possible. In case of figure, the words Rs, should be written before the figure and paise at the end (Viz. Rs, 250.50p). in case of rate or amount in words, the words Rs. should precede and the word only shall be written at the end (Viz. two hundred fifty and paise fifty only).
 - c) Item(s) for which no rate or price has been entered by the contractor / agency shall not be paid for and shall be deemed covered by the other rates / prices in the contract.
 - d) When there is a difference between the rates in figures and in words, the rates, which correspond to the amounts worked out by the contractor, shall be taken as correct.
 - e) When the amount of an item is not worked out by the contractor or it does not correspond with the rates written either in figures or in words, then the rate quoted by the contractor in words shall be taken as correct.

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- f) When the rate quoted by the contractor in figures and words tallies but the amount is not worked out correctly. The rate quoted by the contractor shall be taken as correct and not the amount.
- g) All corrections to rates and amounts in the tender shall be initialed by the contractor. **Every pages including the blank pages of bid document shall be signed by the contractor.**
27. The Equipment shall be loaded and unloaded by the suppliers at his / her own cost and risk.
28. The Equipment shall be dispatched under coverage of transit insurance at the supplier own cost and risk.
29. The firm shall test the equipment at the site selected by the department and render demonstration / operational training to the departmental staff for a period suitable for the purpose.
30. Operation and service manual / catalogues and recommended maintenance chart should be supplied at free of cost along with each equipment.
31. Earnest money of the unsuccessful tenderer will be refunded on finalization of tender or on expiry of validity period which ever is earlier.
32. Transit permit / interstate clearance and such other issues will be the responsibility of the tenderer, Nothing extra will be entertained.
33. No transfer of earnest money from any amount already at the credit of tenderers (as earnest money or security money in connection with other works) will be allowed unless however, it is absolutely free and order for its release has been passed.
34. Canvassing in connection with tenders is strictly prohibited and the tender submitted by the tenderer who will resort to canvassing will be liable to rejection.
35. No non-Indian National as laborer, who does not possess valid passport and visa will be allowed to work under any contractor. If otherwise the contract will be cancelled and there is no bar by police for prosecution of these contractors along with their labourers.
36. Bids will be opened in presence of bidders or their authorized representatives (who choose to attend) on the date and time and at the place specified in the said bid.
37. Defects liability :-
The “Defects liability Period” for the work is 1 (One) year (for articles having commercial warranty more than 1 (one) year, the defect liability for those items will be in accordance with the commercial warranty period as applicable) from the date of acceptance. If any defects noticed within the “Defects liability Period” the same shall be rectified / replaced (same configuration or latest) by the bidder or firm at their cost and risk within 1(one) month from the date of intimation and the defect liability period for the replaced item(s) will be considered from the date of replacement for which proportionate Security Money would be retained till end of the defect liability period as would be applicable for particular Item(s).
38. **The bidder has to provide the duly signed (by the bidder or his Authorized Person) copy of Work / Supply order in similar nature of work / supply in support of previous experience as a prime contractor at least for one similar work of value not less than 80% of the estimated cost put to tender in the last 3 (Three) years to qualify for awarding of the work.**
39. **Tenderer(s) who do not fulfill any of these conditions or are incomplete in any respect, are liable to be rejected. The authority also reserves the right to cancel any of the tenders with out assigning any reason.**

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BID FORM

Name of the Works :- Supplying , testing & Demonstration of Laboratory Equipments for Electric Drives Laboratory of Electrical Engineering Department of Tripura Institute of Technology, Narsingarh, Tripura (West)-799009.

Reference: letter No. dated..... from

Sir,

We offer to execute the work described in your letter referred to above in accordance with the Conditions of Contract enclosed therewith at a total Fixed Contract price of –

Rs ** _____ [in figures]

Rs. _____ [in words]

This bid and your written acceptance of it shall constitute a binding contract between us. We understand that you not bound to accept the lowest or any bid you receive.

We hereby confirm that this bid is valid for not less than 90 days as per terms and conditions already state earlier.

Yours faithfully,

Authorized Signature : _____ Date: _____

Name & Title of Signatory : _____

Name of Bidder : _____

Address : _____

** To be filled in by the Bidder, together with his particulars and date of submission at the bottom of this Form.

Signature of Supplier/ Contractor

Signature of the Principal

Tripura Institute of Technology, Narsingarh

AGREEMENT FORM

Name of work : Supplying , testing & Demonstration of Laboratory Equipments for Electric Drives Laboratory of Electrical Engineering Department of Tripura Institute of Technology, Narsingarh, Tripura (West)-799009.

ARTICLES OF AGREEMENT

1. This deed of agreement is made in the form of agreement on _____day _____ month _____ 2014_____, between the _____ (Employer), or his authorized representative (hereinafter referred to as the first party) and _____(Name of the Contractor), S/O _____ resident of _____(hereinafter to as the second party), to execute the work / supply of _____ (hereinafter referred to as work / supply) on the following terms and conditions.

2. Cost of the Contract

The total cost of the work / supply (hereinafter refer to as the “total cost”) is Rs. _____ as reflected in Annexure – “A”

3. payments under its contract

- a) Payment to the second party for the work will be released by the first party in the following manner :-
payment shall be made immediate after successful completion of the work/supply.
- b) Payments at each stage will be made by the first party:-
on the second party submitting an invoice for an equivalent amount;

4. Completion time

The supply is to be completed within **90 (ninety) days**. The time shall be reckoned from the 15th (fifteenth) day from the date of issue of supply order. In exceptional circumstances, the time period stated in this clause may be extended in writing by mutual consent of both the parties.

5. Any willful delay on the part of the second party in completing the supply within the stipulated period will render him liable to pay liquidated damages @ **Rs. 0.01%** of the contract price per day which will be deducted from payments due to him. The first party may cancel the contract and take recourse to such other action as deemed appropriate once the total amount of liquidated damages exceeds **10%** of the contract amount.

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6. The second party shall:

- a) Take up the supply and arrange for its completion within the time period as stipulated.
- b) Employ suitable skilled persons to carry out the assembling (where necessary) and commissioning; etc.
- c) Be responsible for bringing any discrepancy to the notice of the representative of the first party and seek necessary clarification;
- d) Keep the first party informed about the progress of work;
- e) Be responsible for all security and watch and ward arrangements at site till completion of the work and handing over as well.
- f) Pay all duties, taxes (VAT) and other levies payable by agencies as per law under the contract (First party will effect deduction from running bills in respect of such taxes as may be imposed under the law).

7. Security money

The Security money shall be refunded after expiry of the “**defects liability period**”.

8. Dispute settlement:-

Except where otherwise provided in the contract all questions and disputes relating to the meaning of the specifications, designs, drawings and instructions hereinbefore mentioned and of workmanship or materials used on the work or as to any other question, claim, right matter or thing whatsoever, in any way arising out of or relating to the contract, designs, drawing, specifications, estimates, instructions orders or those, conditions or otherwise concerning the work / supply, or the execution or failure to execute the same whether arising during the progress of the work / supply or after the completion or abandonment thereof shall be referred to the sole arbitration of the person appointed by the Director of Higher Education, Government of Tripura. It will be no objection to any such appointment that arbitrator so appointed is a Government servant, that he had to deal with the matters to which the contract relates and that in the course of his duties as Government servant he had expressed views on all or any of the matters in dispute or difference. The arbitrator to whom the matter is originally referred being transferred or vacating his office or being unable to act for any reason, such Director of Higher Education or as aforesaid at the time of such transfer, vacation of office on inability to act, shall appoint another person to act as arbitrator in accordance with the terms of the contract. Such persons shall be entitled to proceed with the reference from the stage at which it was left by his predecessor. It is also a term of this contract that no person other than a person appointed by such Director of Higher Education or as aforesaid should act as arbitrator and if for any reason that is not possible, the matter is not to be referred to arbitration at all. In all cases where the amount of the claim in dispute is Rs. 50,000 (Rupees fifty thousand) and above, the arbitrator shall give reasons for the award.

Subject as aforesaid the provisions of the Arbitration act, 1940, or any statutory modification or re-enactment thereof and the rules made there under and for the time being in force shall apply to the arbitration proceeding under this part.

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It is also a term of the contract that the party invoking arbitration shall specify the dispute or disputes to be referred to arbitration under this part together with the amount or amounts claimed in respect of each such dispute.

It is also a term of the contract that the party invoking arbitration shall specify the dispute or disputes to be referred to arbitration under this part together with the amount or amounts claimed in respect of each such disputes.

It is also a term of the contract that if the contractor(s) do / dose not make any demand for arbitration in respect of any claim(s) in writing within 90 days of receiving the intimation from the Government that the bill is ready for payment the claim of the contractor(s) will be deemed to have been waived and absolutely barred and the Government shall be discharged and released of all liabilities under the contract in respect of these claims.

The arbitrator(s) may from time to time with consent of the parties and enlarge the time for making and publishing the award.

The Arbitration proceedings shall be held at Agartala, Tripura, India and the language of the arbitration proceedings and that of all documents and communications between the parties shall be English.

DECLARATION :-

I / we have gone through carefully all the tender conditions and solemnly declare that I / we will abide by any penal action such as disqualification or black listing or termination of contract or any other action deemed fit, taken by, the department against us, if it is found that the statements, documents, certificates produced by us are false / fabricated.

I / we hereby declare that, I / we have not been black listed / debarred / suspended in any department in Tripura or in any other state of India due to any reason.

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Annexure –“A”

Name of work :- **Supplying , testing & Demonstration of Laboratory Equipments for Electrical Engineering Department of Tripura Institute of Technology, Narsingarh, Tripura (West).**

BILL OF QUANTITIES

1	2	3	4	5	6	7	8	9	10
SL. No.	Name of Equipments with Specifications.	Brand name / Model no	Quantity	Unit	Unit Price In figure. (In INR)	Unit Price in Words	Tax if any , if contract is awarded. (In INR)	Rate in Figure (Inclusive of Taxes) (In INR)	Total Amount Col.(4 X 9)
01.	<p>CLOSED LOOP SPEED CONTROL OF 1(ONE) HP SEPARATELY EXCITED DC SHUNT MOTOR</p> <p>This System is to be designed and supplied to drive the Separately Excited DC Motor with Closed loop. It should consist of a Converter for Armature and Field Voltage of the DC Motor, a P-I Controller with two P-I for Current and Speed closed loop control and a Mechanical Setup.</p> <p>The system to be supplied with following Features.</p> <ul style="list-style-type: none"> • One potentiometer as Input transducer for converting reference voltage to reference Speed. • A Speed sensor to be coupled with the Motor to be supplied for feedback signal for Proportional and 		01 Set						

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	<p>Integral Control of the Speed.</p> <ul style="list-style-type: none"> • The Output of the Speed Sensor to be used for speed measurement. • The output of the Speed sensor is to be signal conditioned and calibrated to indicate the speed of the Motor. • Summing Amplifier to receive inputs, reference Signal and Signal from the Speed Sensor. <p>Specifications:</p> <p>1. DRIVE CIRCUITRY :-</p> <ul style="list-style-type: none"> • This system should be supplied to drive 1 HP DC shunt Motor & speed control in both open loop and closed loop. • Both Armature and Field control facilities are to be provided. • The system should be supplied with SCR based controlled converter for Armature voltage variation @ 5 Amps. Capacity. • One no. SCR based fully controlled converter for field voltage adjustment @ 1A. • Two sets Triggering circuits for SCR voltage. • Rotary switch to select Open loop & Closed loop. • P-I Controllers Adjustment for Speed control. • Potentiometers to vary the Armature and Field voltages at Open loop speed Control. • MCB to be provided for ON/OFF the system. • Over current & field failure protection system to be provided. <ul style="list-style-type: none"> • Shut down status indicator and reset switch are to be provided. • Digital Speed indicator to be provided for the speed 								
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<p>Measurement.</p> <ul style="list-style-type: none"> • Hall Effect current sensor to be provided for current feedback, closed loop and protection. • One toggle switch to be provided for feedback connection. • Provision for reference speed in terms of voltage through potentiometer • Input: 230V AC @ 50 HZ. <p>2. PI CONTROLLER:</p> <ul style="list-style-type: none"> • Two P-I controller to be provided for speed and current control. • Each P-I controller to be provided with front panel variable setting to <ul style="list-style-type: none"> Vary the Proportional Gain Vary the Integral Gain • Error Amplifier to be provided • The System to be housed in a sleek Cabinet • Proportional gain and Integral gain to be varied by a Rotary Switch. <p>3. 1 HP DC MOTOR-GENERATOR SETUP :</p> <ul style="list-style-type: none"> • One no. 1(One) HP Separately excited DC Motor Mechanically coupled to another 1 HP DC Motor to act as a Generator. This Motor- Generator setup to be fitted on a common base made of M.S. Channel. • One Quadrature Type Optical encoder for speed feedback for closed loop speed control of this Setup. • The Armature terminals of the Generator are to be brought out for Electrical loading arrangement. <p>4. PROTECTION</p> <ul style="list-style-type: none"> • Soft / Start facility. 									
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	<ul style="list-style-type: none"> • Field failure safety device • Armature Over current protection for the Motor • Voltmeter to be provided for field voltage. • Current meter for field current. • Voltmeter for Armature voltage Measurement. • Current meter for Armature current Measurement. <p>One 1 KVA Isolation Transformer to be Provided.</p> <ul style="list-style-type: none"> • Input: 230V at 50 HZ. • Output: 110V at 50 HZ & 230V at 50 HZ. <p>One 10 Amps Single Phase Auto Transformer is to be provided.</p> <p>The following Experiments are to be performed using this setup:</p> <ol style="list-style-type: none"> 1. Open loop Armature control of DC Shunt Motor. 2. Closed loop Armature control of DC shunt Motor with Speed and Current Feedback. 3. Field controls of DC shunt Motor. 4. Speed Control of DC Shunt Motor by Varying the P & I Constants of the P-I Controllers. 								
02	<p>CLOSED LOOP SPEED CONTROL OF 1 HP SQUIRREL CAGE INDUCTION MOTOR.</p> <ul style="list-style-type: none"> - This System is to be supplied to drive a three phase 1 HP three phase Squirrel Cage Induction Motor using SCR based V/F Controller for both Open & Closed loop Speed control. - The System should be provided with SCR based Converter and Inverter for V/F Controller & variable voltage to be achieved by controlling the firing angle of SCR Converter and as well as variable frequency to be achieved by controlling the firing pulse frequency. 		01 Set						

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<p>SCR CONVERTER AND FIRING CIRCUIT:-</p> <ul style="list-style-type: none"> - Operational Amplifier based linear firing circuit to vary the firing angle 0° - 180°. - One potentiometer to be provided to vary the firing angle. - Pulses to be Isolate by pulse transformers and must be terminated in the front panel. - LC Filter to be provided to give the DC Voltage to the input of the SCR based Inverter. - MCB & fuses of required ratings are to be provided for over current protection and one DC Voltmeter to be provided for DC Voltage Measurement. <p>SCR BASED INVERTER AND FIRING CIRCUIT:-</p> <ul style="list-style-type: none"> - Three phase firing circuit to be provided for the adjustment of frequency from 10HZ to 50HZ. - DC adjustment of firing angle to be provided - Necessary Circuit to be provided for commutation. - Separate control circuit to be provided for the adjustment V/F ratio for open loop & closed loop control of the AC Motor. - Input voltage: 0 - 440V AC three phase and Output: 0 – 415V AC Variable and the frequency in the range 10 HZ – 50 HZ., Current ratings: 5 Amps. <p>One 1 HP three Phase Squirrel cage Induction Motor with Mechanical loading Arrangement along with Speed Sensor for speed feedback to be provided for the closed loop Speed control of the Motor.</p> <p>1(One) KVA Isolation Transformer along with all Electrical Safety Measures to be provided, Input of 230V at 50 HZ and Output of 110V at 50 HZ & 230V at 50 HZ.</p> <p>One 10 Amps rated Single Phase Variac to be provided.</p>									
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Signature of Supplier/ Contractor

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03	<p>SPEED CONTROL OF 1HP DC SERIES MOTOR USING SCR BASED JONES CHOPPER</p> <p>This setup is to be designed and supplied for open loop and closed speed control of 1(One) HP DC series Motor using SCR based Jones Chopper circuit.</p> <p>The System should consist of (1) SCR Jones Chopper Firing and Power Circuit, (2) DC Series Motor Setup. (3) Digital P-I Controller ,(4) Isolation Transformer.</p> <ol style="list-style-type: none"> 1. SCR based Jones Chopper Firing and Power Circuit <ul style="list-style-type: none"> • Two nos. Chopper Firing and Power Circuit. • Two nos. SCR with RC Snubber Circuits. • Two nos. Diodes and one fixed load resistance. • One Center tapped Inductor for Power Circuit with commutating Capacitor. • Two Isolated firing pulses for firing SCR. • Two nos. Toggle Switches to Switch ON Auxiliary SCR pulse and main SCR pulse. • One 300V Fixed DC Supply for power circuit and one toggle Switch to ON/OFF DC Supply. • All inputs and outputs components are to be terminated in a PCB for Experimentation using Patch Chords. • Necessary test points are to be provided for studying the firing circuit. • One potentiometer to be provided for varying the Duty Cycle. 2. DC Series Motor Setup <ul style="list-style-type: none"> • Rating: 1(One) HP. • Armature Voltage: 220V DC at 5 Amps. • Speed: 1500 RPM. • Double Side Shaft Extension to be provided. 		01 Set						
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Signature of Supplier/ Contractor

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	<ul style="list-style-type: none"> • Speed sensor with speed display and speed feedback facility to be provided. • Mechanical Spring balance load setup to be provided. <p>3. 1(One) KVA ISOLATION TRANSFORMER.</p> <ul style="list-style-type: none"> • Input: 230V at 50 HZ. • Output: 110V at 50 HZ & 230V at 50 HZ. <p>4. One 10 Amps rated Single Phase Variac is to be provided.</p> <p>5. Digital P-I Controller for closed loop Operation.</p> <ul style="list-style-type: none"> • Intel 8085 Microprocessor based CPU card. • Analog to Digital Converter as Input. • Digital to Analog Converter as output. • One Current to voltage and one Voltage to current converter to be provided. • Keys to be provided to give Reference Speed, Increment, Decrement function etc. • Monitor Firmware to be provided using a EPROM/ EEPROM etc. • User RAM to be provided along with Battery backup. • Display unit to be provided. • Keyboard to be provided for programming and editing etc. • In-built Power Supply System is to be provided for this Card using a separate SMPS to power up this Microprocessor unit along with A/D & D/A Cards and PPI. 								
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04	<p>SPEED CONTROL OF 3HP THREE PHASE SLIP RING INDUCTION MOTOR USING SCR BASED STATIC KRAMER DRIVE</p> <p>This setup is to be designed and supplied for open loop speed control of a 3HP Slip Ring Induction using SCR based Converter and Inverter. This System should consist of followings:</p> <ol style="list-style-type: none"> 1. SCR based 3-phase Inverter: <ul style="list-style-type: none"> • It should consist of 6 nos. of SCRs rated at 1200V, 50 Amps. With suitable heat sinks to form 3 phase fully controlled converter to be functioned as a 3 Phase Inverter. • Six Isolated gate Signals to be provided for Full Bridge Converter. • Firing angle variable from 180° to 0° through Ramp and pedestal control. • Gate carrier source to be provided. • The System to be housed in a sleek Cabinet. • Test points are to be provided on the Front Panel for detail study of Circuits signals during Experimentation. • Necessary test points are to be provided and terminated so that the different test signals/ data can be monitored during Experimentation using DSO, CRO & DVM etc. • One ON/OFF switch with Indicator to be provided to power the control circuitry. 2. 3 HP Slip Ring Induction Motor with Diode Bridge Rectifier: <ul style="list-style-type: none"> • 3 HP Slip Ring Induction Motor coupled with another 3HP DC Separately Excited DC Shunt 		01Set						
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	<p>Motor on Common base made of M.S. Channel to be supplied.</p> <ul style="list-style-type: none"> • One three phase Transformer of required ratings & Specifications should be supplied for Slip Power Recovery through Diode-Bridge Rectifier & Inverter. • One no. 3 phase bridge rectifier is to be provided to covert Rotor circuit voltage 210V to DC. • Necessary Inverter circuit to be provided for Slip Power recovery. • One no. of “L” & “R” of required ratings should be provided for DC filtering. • Necessary test Points are to be provided. • Entire Control Circuit to be mounted inside a compact box. • Mimic circuit diagram is to be provided on the Front Panel. <p>3. 1(One) KVA ISOLATION TRANSFORMER.</p> <ul style="list-style-type: none"> • Input: 230V at 50 HZ. • Output: 110V at 50 HZ & 230V at 50 HZ. 								
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Gross Total Cost : Rs.-----

We agree to supply the above goods in accordance with the technical specification for a total contract price of Rs..... (Amount in figures) (Rupees amount in words) with in the period specified in the Invitation for tender.

We also confirm that the normal commercial warranty / guarantee of months shall apply to the offered goods.

Signature of Supplier/ Contrac

Signature of the Principal