भारतीय प्रौद्योगिकी संस्थान (भारतीय खनि विद्यापीठ), धनबाद- ८२६००४
Indian Institute of Technology (Indian School of Mines)
Dhanbad – 826004, Jharkhand, India

No. MME-500462-2016-17 Date: 28 February 2017

To
M/s

Sir,

Indian Institute of Technology (Indian School of Mines), Dhanbad invites quotations for the following to be supplied and delivered in MME Department.

S No	Full Description of items/ store	Qty	Rate	Amount
1	**Supply & Installation of Laboratory Kit of Micro-controller based Chopper (buck DC to DC converter) for R-L load** (Detailed Specification is given in Annexure – I)	02 Nos		
2	**Supply & Installation of Laboratory Kit of Micro-controller based full controlled full bridge Thyrister AC to DC converter**	02 Nos		
3	**Supply & Installation of Laboratory Kit of Micro-controller based half controlled half SCR/Diode bridge AC to DC converter**	02 Nos		
4	**Supply & Installation of Laboratory Kit of Micro-controller based single phase inverter (SINE/SQUARE wave AC to DC converter**	02 Nos		
			Packing & Forwarding, if any	
			Freight Charge, if any	
			Installation, if any	
			CST/VAT, if any	
			Grand Total	

Tender Schedule

Particulars	Date & Time
Last date for seeking clarification/s (if any)	**14.03.2017 at 3:00 P.M.**
Date and time for submission of tenders	**21.03.2017 at 3:00 P.M.**
Date and time of opening of tenders	**21.03.2017 at 4.00 P.M.**

1. You are requested to quote your lowest rates for the supply of above items.
2. Clarification(s) sought after the prescribed date shall not be entertained.
3. You may send your representative in the office of the undersigned at the scheduled date and time of opening of tender.
4. Tender should be submitted in sealed cover only superscribed with Enquiry No. and due date at the following address only:

The Asst Registrar (P&S)
Indian Institute of Technology (Indian School of Mines),
Dhanbad – 826 004 Jharkhand
P: 0326-2235612
E: drps@ismdhanbad.ac.in

Contd.....P/2

P 1/2

The detailed Technical specification

(Each point should be complied separately)

1. **Micro-controller based Chopper (buck DC to DC converter) for R-L load:**

   1. Input voltage: 230V, 50Hz AC rectified to create 325V DC BUS voltage.
   2. Switching device: MOSFET, step down from BUS of 325V directly.
   3. Output voltage variation: High speed digital PWM modulation through micro-controller.
   4. Provision of changing duty cycle: through a push button.
   5. Output range: 40V to 220V DC (variable) to an R-L load, provision of feeding to a DC motor, if needed.
   6. Softening of output voltage: Reduces surge current.
   7. Metering: Armature voltage and current through analog meter
   8. LCD display: 20 character 4 line showing duty ratio, input voltage, output voltage, output current.
   9. High speed current sensor: Hall Effect, high band-width current sensor to sense output current.
   10. Advanced micro-controller based control: 12 bit ADC to measure input voltage, DC BUS voltage, and output current sampled at PWM frequency.
   11. An R-L load of 5A max.
   12. Provision for using external PWM for the MOSFET driver.

   Test Points (minimum 4 nos) • Detailed Instruction Manual

2. **Micro-controller based full controlled full bridge Thyristor AC to DC Converter:**

   1. Input voltage: 230V, 50Hz AC
   2. Power Topology: fully controlled SCR bridge single phase operating from the mains directly.
   3. Output voltage variation: High speed digital PWM modulator for firing angle control through micro-controller.
   4. Output L-C filter.
   5. Output voltage range: 40V to 220V dc (variable) to an R-L load variation through a push button (firing angle variation).
   6. Softening of output voltage: Reduces surge current.
   7. Metering: Output voltage and current through analog meter
   8. High speed current sensor: Hall Effect, high band-width current sensor to sense output current.
   9. Advanced micro-controller based control: 12 bit ADC to measure input voltage, output voltage, output current sampled at PWM frequency.
   10. LCD display: 20 character, 4 line showing firing angle, input voltage, output voltage, output current.
   11. An R-L load of 5A max.
   12. Provision of using external signal for firing.

   Test Points (minimum 4 nos) • Detailed Instruction Manual

P 2/2

3. **Micro-controller based half controlled SCR/Diode bridge AC to DC Converter:**

1. Input voltage: 230V, 50Hz AC
2. Power Topology: half control SCR/Diode bridge single phase operating from the mains directly.
3. Output voltage variation: High speed digital PWM modulator for firing angle control through micro-controller.
4. Output L-C filter.
5. Output voltage variation: 40V to 220V dc (variable) to an R-L load variation through a push button (firing angle variation).
6. Softening of output voltage: Reduces surge current.
7. Metering: Output voltage and current through analog meter
8. High speed current sensor: Hall Effect, high band-width current sensor to sense output current.
9. Advanced micro-controller based control: 12 bit ADC to measure input voltage, output voltage, output current sampled at PWM frequency.
10. LCD display: 20 character, 4 line showing firing angle, input voltage, output voltage, output current.
11. A R-L load of 5A max.
12. Provision of using external signal for firing angle.

Test Points (minimum 4 nos) • Detailed Instruction Manual

4. **Micro-controller based single phase inverter (SINE/SQUARE wave DC to AC converter):**

1. Input voltage: 230V, 50Hz AC rectified to create 325V BUS voltage.
2. Power Topology: MOSFET based four switch full bridge single phase inverter, operating from a BUS voltage of 325V.
3. Output voltage variation using high speed digital sinusoidal PWM modulation through an advanced micro-controller that can be configured for square wave as well.
4. Softening of output voltage to reduce surge current.
5. Output: 40V to 220V ac (variable) to an R-L load, can be fed to a single phase ac motor as well.
6. Metering: Output voltage and current through analog meter.
7. High speed current sensor: Hall Effect, high band-width current sensor to sense output current.
8. Provision for varying modulation index, mode: SINE PWM, SQUARE WAVE using a push button.
9. Advanced micro-controller based control: 12 bit ADC to measure input voltage, output voltage, output current sampled at PWM frequency
10. LCD display: 20 character, 4 line showing modulation index, input voltage, output voltage, output current.
11. A R-L load of 5A max.
12. Provision for applying external PWM to the gating circuits for MOSFETs.

Test Points (minimum 4 nos) • Detailed Instruction Manual

Terms & Conditions

1) Please submit authorized dealership certificate, if you are not a manufacturer.
2) Please mention Sales Tax, CST, VAT, TIN and PAN numbers and Bank Account Number and name of the bank/ branch in your offer.
3) Conditional offer will not be accepted.
4) Please indicate rate of taxes/ duties clearly. Rates quoted will be taken as inclusive of all taxes unless given separately.
5) The rates should be quoted for each item separately.
6) IIT (ISM) does not issue any Form 'C' or 'D' towards sales tax concessional rate. Hence, full rate of sales tax/VAT applicable should be quoted.
7) ***Educational discount,*** if any, should be clearly mentioned.
8) You are requested to submit your quotation strictly as per the specifications mentioned in the NIT.
9) Further the following documents have to be furnished by the tenderers:
    a. Self attested copies of credentials in support of capability to undertake the supply/ work.
    b. Detailed technical.specifications of equipments.
    c. Technical literature/ catalogue alongwith offer.
    d. Satisfactory performance certificate from their customer for same/ similar supply/ service must be enclosed alongwith the technical bid.
10) Your tender must be valid for **minimum 90 days** from the date of opening of tender.
11) Please mention warranty/ guarantee in your offer clearly. Material/ equipment to be supplied must have minimum warranty/guarantee of **12 months**.
12) *Each page in the bid document should be numbered properly.*
13) **The items/ materials shall be required to be delivered at MME Department/ Section through Purchase & Store Section, IIT (ISM) Dhanbad** at the risk and cost of the tenderer.
14) Unloading & installation shall be the complete responsibility of the supplier.
15) The stores are required to be delivered within 30 days. Late delivery may not be accepted.
16) The items offered should be of good quality confirming to BIS standards, wherever applicable.
17) ***Advance payment is not admissible***. Payment shall normally be made within 3-4 weeks subject to receipt and acceptance & installation (as per Purchase Order Terms) of the ordered materials/items.
18) In the event date on which the tender is opened for acceptance is declared to be a holiday, the tenders shall be deemed to remain open for acceptance till the next working day.
19) Please send your offer by Regd.Post/ Speed Post/ Courier along with Courier receipt. Tender/ quotation will be received during IIT (ISM) working hours only (i.e. Monday to Friday). *Late or delayed tenders shall be summarily rejected.*
20) Any other information that you may like to obtain, you are free to contact IIT (ISM) before submission of tender.
21) IIT (ISM) reserves the right to accept and/or to reject any/ all tenders without assigning any reason.

Asst Registrar (P&S)
P: 0326-2235612
F: 0326-2296633
E: drps@ismdhanbad.ac.in