

Department of Electrical Engineering
INDIAN INSTITUTE OF ENGINEERING SCIENCE & TECHNOLOGY, SHIBPUR

(Under Ministry of Human Resource Development, Government of India)
(Formerly, Bengal Engineering & Science University, Shibpur)
P.O. Botanic Garden, Howrah – 711 103, West Bengal, India

BIDDING DOCUMENT

Ref.: Advt. No. **NO/D(AA)/16/65**

Date: 25.11.2016

*For the Supply of
Laboratory Equipment including Installation, Software, Computers,
for the Department of Electrical Engineering*

SECTION-I : General Conditions and Important Instructions for the Bidders

It is necessary to submit the original tender documents with (i) technical bid and (ii) price bid in separate sealed envelopes to the **Head, Department of Electrical Engineering, Indian Institute of Engineering Science and Technology (IEST), Shibpur; Howrah-711103**, or directly to **Drop** in the **Tender Box** kept in the Department.

1. The envelope must be superscripted with the "**Tender Advt. No. NO/D(AA)/16/65**" along with the bidder's name and address.
2. Only original manufacturers/ sole authorized dealers of manufacturers/ country representatives should participate in the bid whose products match the required product specifications. Bidders are to abide by the terms and condition and submit this tender document in original duly signed with acceptance of the terms and conditions.
3. All bidders must submit Earnest Money Deposit (EMD) @2% of the offer value (rounded up to nearest hundred) or Rs. 5000/- whichever is higher in the form of Demand Draft / Pay Order in favor of "**Registrar, IEST, Shibpur**" payable at Kolkata must accompany the tender, failing which tenders will be rejected.
4. DGS&D rate contract price will be preferred wherever applicable. The EMD may be exempted for the bidders offering DGS&D rates and for the vendors or original manufacturers from abroad.
5. Last date of receipt of tender is **16th December 2016 (Friday)** by 3.00 pm. Tenders received late will not be accepted under any circumstances. Tenders will be opened in the Office of The Head, Department of Electrical Engineering on the same day at 3.30 pm. In case the Institute remains closed on the said date, tenders will be opened on next working day at 3.30pm.
6. The Price Bid should clearly mention the price including the following:
 - Ex Works Price in INR/USD/GBP/Euro/JPY
 - Price must be inclusive of all (Packing and Forwarding Charges, Freight, Tax, delivery charges, Erection, Commissioning/ installation and testing charges, demonstration etc.) for the door delivery at EE Department, Indian Institute of Engineering Science & Technology, Shibpur, Howrah – 711103.
7. The University will not issue any C or D form availing for concessional Sales Tax/ VAT. The University will issue Customs Duty Exemption Certificate or Excise Duty Exemption Certificate for import items, if required.
8. The equipments are to be supplied at the Department of Electrical Engineering between 11.00 am and 4.00 pm from Monday to Friday except holidays. The bidders will be responsible for any breakage, damage or defect in the equipment detected subsequently.
9. Quantities mentioned are all representative. Offer must be quoted on a per unit basis.
10. Period of delivery is 3 to 4 weeks from the date of issue of Purchase Order. If the supply is not completed within the stipulated period as indicated in the Purchase Order a Liquidated Damage @ 0.5 % per week will be imposed on the value of purchase order.
11. Bills and Challans in triplicate should be presented for payment within 15 days of supply/ Commissioning of work. No advance is paid for execution of the order except in the case of direct supply by foreign vendors. The Order No. is to be noted on both Challan and Bill. All bills are to be accompanied by order copies and Challan receipt.
12. Payment will be made on submission of Proper Bills, Challans etc, by A/C Payee Cheque or Wire Transfer in case of import and no cash payment will be made under any circumstances.

13. All payments are subjected to statutory deductions as and when applicable.
14. Tender is to be kept valid for acceptance up to **31st March 2017** without any modifications in its terms and conditions.
15. Document to be submitted with the tender:
 - Tender document, Supplier's credentials, general conditions, and important instruction in original duly signed by the Proprietor/Partner/Director of the Company as a token of acceptance of terms and conditions of Tender.
 - Latest Income Tax, Sales Tax, Professional Tax clearance certificates and copy of valid trade license
 - Technical Bid, Price Bid (Priced) separately in two sealed envelope according to specifications.
16. Technical Terms & Conditions:
 - All the equipment shall carry a standard warranty for a period of minimum 12 months from the date of completion of installation/commissioning against any manufacturing defect if not otherwise mentioned. Please check the technical specification of the individual equipment for special/extended warranty requirement if any.
 - Valid agency certificates from the Principal manufacturers have to be submitted. For authorized dealers and the proprietary items, the authorization letter and proprietary certificates should be issued by the principal company in the name of Head of EE department mentioning the present Tender Advt. No.
 - Calibration and test certificates must accompany the equipment.
 - Repair and maintenance manual along with wiring diagram, where applicable, must be supplied with the equipment as specified in the technical specification of the individual equipment.
 - Supply of Lab. Equipment shall include installation, erection, commissioning and demonstration.
17. Indian Institute of Engineering Science & Technology (IEST), Shibpur, Howrah reserves the right to accept / reject all or any parts of the bids without assigning any reason whatsoever.

I/We accept the above terms and conditions.

Signature of the Bidders with date and seal

Department of Electrical Engineering

INDIAN INSTITUTE OF ENGINEERING SCIENCE & TECHNOLOGY, SHIBPUR, HOWRAH-3.

Section-II: Detailed Specifications of the items for Tender Advt. No. -

NO/D(AA)/16/65 Date: 25.11.2016

Item #I: **SPLIT AIR CONDITIONERS FOR CLASS ROOMS** - 4 Nos. approx

Rating(tonnage)	- 2 Ton – 24000BTU
Cooling	- ~7000W (approx)
Compressor	- Rotary (R22)
Power Supply	- 230V, 1ph, 50Hz
Power Input	- <1850W
Current	- <9A
BEE Star Rating	- 5 star
Air circulation	- 650-1200 CFM
Air Swing	- Up-down, Left-right
Filters	- Anti Dust, Micro protection filter, Catechin Filter, Acaro Bacterium, Silver Ion,
Fin	- Hydrophylic Aluminium
Copper Tube	- All copper tubing with Inner Grooved
Indoor Unit	- LED Display, Ionizer, Self Diagnosis, Anti Fungal Clean, Auto Restart, Sleep Mode, Monsoon comfort
Remote	- LCD Remote, Lock, Timer, Fungus-proof, Turbo, Glow Buttons, Dual Temperature Display
Air Vent	- Cross Flow
Noise level	- Indoor unit : <40dB
Installation	- Free standard installation. Additional length of accessories like copper tubes, wires, water pipe etc. as required would be on per running foot basis.

Item #II: **NON-INVASIVE CONTINUOUS GLUCOSE MONITOR** - 2 Nos. approx

Range	: 50 – 500mg/dL or better
Accuracy	: ± 1 mg/dL
Test time	: < 2min
Sensor	: Laser/LED (600 – 1150nm)
Laser Power	: 5-35mW
Method	: NIR Spectroscopy
	• Fibre-optic guides with detector, direct reading type or RF,
	• Wide screen display, with RS232/USB interface.
	• Analog/Digital output of continuous measurement at least every 10 minutes
	• Easy adjustment of measurement delay for oral and intravenous ingestion
	• Easy Calibration procedure
Make	: CNOGA/Abbott(SpectRx)/OMELON/OrSENSE or equiv.

Item #III: **COMBO GLUCOMETERS – NON-INVASIVE & INVASIVE GLUCOSE MONITORING DEVICE.** - 2 Nos. approx

- Hybrid non-invasive and invasive device to measure capillary blood glucose and multi bio parameters (pulse, BP, Hb, Hct, ...etc)
- Calibration with minimally invasive sensor
- TFT color display and USB connectivity
- History management

Item #IV: HANDHELD DSO & MULTIMETER - 1 No.

Bandwidth	- 20Mz
Channel	- 2 (floating isolated)
Sampling Rate	- 100MSa/s
Display	- 3.8" color LCD
Time scale	- 1ns/div
Multimeter functions-	TRMS, Volt, Amp, Ohm and continuity
Interface	- USB
Battery	- Heavy duty Li-ion battery
Warranty	- 3 years comprehensive

Item #V: DDS FUNCTION GENERATOR - 1 No.

Frequency Range	- 0.1Hz-3MHz with DDS technology
Output Waveforms	- Sine/Triangle/Square and other arbitrary functions
Channels:	- 2
Sampling rate	- 125MSa/s
Resolution	- 100mHz minimum
Frequency Accuracy	- ± 20 ppm
Frequency Stability	- ± 20 ppm Max
Frequency setting	- through numeric keypad, with each of the 6 digit control thru. Linear potentiometer.
Aging	- ± 5 ppm/year
Amplitude	- from 1.1mV peak to 20 volt p-p (into 50 Ω load)
Adjustable DC Offset	- -5V. to +5V
Display	- Frequency and Voltage amplitude
Duty Cycle control	- 25% to 75% (below 1MHz in Square wave)
Square wave symmetry	- 5% of period 4ns - 0.1Hz-100kHz
Interface	- USB/RS-232C/RS-485
Supply input	- 100 – 240V AC 1 ph. 50Hz
Accessory	- power chord, BNC to Crocodile Clip \times 1
Warranty	- 3 years comprehensive

Item#VI: DC POWER SOURCE - 1 No.

Three phase fully controlled anti parallel bridge for four quadrant operation

Input Voltage: Three phase 400 V, 50 Hz

Output Voltage: 0 to \pm 220V DC (variable)

Output current: 10 A DC maximum

Output voltage ripple 10% maximum at 220 VDC and 10 A current

Analog input signal (0 to ± 5 V) for output voltage control.

Analog input port is available externally. In built current limiting facility.

Warranty: 2 Years

Item#VII: FPGA BASED DEVELOPMENT BOARD - 4 Nos. approx

The board must be based on Field Programmable Gates Array (FPGA) processor chip (Make Altera or Xilinx) integrated properly with requisite power supply, Analog-to-Digital Converter (ADC's minimum 12bit), Digital-to-analog Converters (DAC's minimum 12 bit), buffers, driver, interface card etc. The total solution has to be confined within preferably one PCB or in two PCB's in the worst case. Design should be compact, modular and such that EMI problems are absent. 8 no.s of ADC channels (with 8 more spares), 4 numbers of DAC channels, 60 Input/Output (I/O) lines minimum, 12k logic elements minimum Serial programming option, JTAG equivalent byteblaster cable (USB computer port compatible) should accompany the kit

In-built 64 kB serial EEPROM memory Minimum 4 MB flash memory (active serial configuration device).

User/Customer will connect the board to a 230V, 50 Hz single phase AC mains and all internal power supply, as applicable, should be derived as per internal design of vendor. The entire system should be housed inside a proper cubicle. ADC channel inputs, DAC channel outputs and all user-usable digital I/O pins should be externally terminated to suitable screw-type connectors for user's access.

Optional: RS232 interface/USB interface/LCD interface/CAN interface features

Warranty: 2 years

Item-VIII: REAL TIME DSP BASED CONTROLLER DESIGN TOOL – 1 No.

Real-time Processor: Dual-core, 2 GHz (minimum)
Memory: 1 GB DRAM, 128 MB flash memory
Analog input: 24 Numbers, 16 bits, MSps , differential Input voltage range- -10 V to 10 V
Analog output: 16 16-bit channels, 1 Msps, Output Voltage range- -10 V to 10 V, Output current- +/- 8 mA
Digital I/O: 48 bidirectional channels, 2.5/5 V (single ended), 12 bidirectional channels (RS422/485 type) to connect sensors with differential interfaces.
Electrical motor control: 2 resolver interface
I/O functionality: 6 encoder sensor input
Software: Experimentation Software , RTI Libraries , Compilers etc. Real-time Interface (RTI) for Simulink® for model-based I/O Integration

Warranty: 2 years

Item #IX: 200 MHz, 4 ISOLATED CHANNEL OSCILLOSCOPE – 1 No.

Bandwidth - 200MHz
Channel - 4
Sampling Rate - 2GSa/s
Data record length - 2.5k points or more per channel
Display - 1/4 VGA Active TFT Color LCD display with sin(x)/x interpolation
Vertical Sensitivity - 2mV/div – 5V/div
Maxm input voltage - 1 MΩ: 300 VRMS CAT II from BNC signal to BNC shell Float Voltage 600 VRMS CAT II from BNC shell to earth ground

Vertical accuracy	- $\pm 3\%$
Vertical Resolution	- 8 bit
Input Coupling	- AC, DC, GND
Time Scale	- 4ns/div to 100s/div – 50s/div
Time-base delay	- 10 divisions to 5000 s
Time base accuracy	- ± 25 ppm over any ≥ 1 ms interval
Trigger system	- Auto, Normal, and Single Sequence; Coupling - AC, DC, Noise Reject, HF Reject, LF Reject; Edge (Rising or falling) Conventional level-driven trigger. Positive or negative slope on any input.
Pulse Width (glitch)	- Trigger on a pulse width less than, greater than, equal to, or not equal to a selectable time limit ranging from 33 ns to 10s
Math functions	- Add/ Subtract/ Multiply, FFT windows: Hanning, Flat Top, Rectangular; 2048 sample points
Measurements	- ΔT , $1/\Delta T$ (frequency), ΔV , $dv/dt \times 6$, di/dt
Communication	- RS-232 Port (Standard), Full talk/listen modes. Control of all modes, settings, and measurements. Baud rate up to 19,200, Printer port: Standard USB.
Supply input	- 100 – 240V.AC 1 ph. 50Hz
Accessories	- 100 MHz, $10\times$ passive probe (one per analog channel), software, cables, manual
Software	- Power Measurement and Analysis Software suitable for the oscilloscope

Item #X: **100AMP AC/DC CURRENT PROBE.** – 2 to 4 Nos.

Reputed make current probes with wide bandwidth usable for both dc and non-sinusoidal ac current.