INVITATION FOR QUOTATION

TEQIP-III/2019/gebk/Shopping/15 **31-Jan-2019**

To be Published in GEC Bikaner Web site

Sub: Invitation for Quotations for supply of Goods

Dear Sir,

1. You are invited to submit your most competitive quotation for the following goods with item wise detailed specifications given at Annexure I,

Sr. No	Brief Description	Quantity	Delivery Period(In days)	Place of Delivery	Installation Requirement (if any)
1	Boost Converter	2	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	
2	Buck Boost Converter	2	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	
3	Buck Converter	2	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	
4	Capacitive load	4	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	
5	Current Probe	2	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	

6	Differencial Probe	4	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	
7	Digital Storage Oscilloscope	4	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	
8	Electronic Power Supply	4	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	
9	Experimental setup for Single Phase PWM AC controller	2	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	
10	Experimental setup for Single Phase PWM Inverter	2	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	
11	Experimental setup for Three Phase PWM AC controller	2	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	
12	Experimental setup for Zero Current Switching	2	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	
13	Experimental setup for Zero Voltage Switching	1	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	
14	Inductive Load	4	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	
15	LCR Meter	2	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	
16	LCR Meter(100khz)	1	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	

17	Lux Meter	1	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	
18	Power Factor Corrected controller based PMBLDC Drive	2	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	
19	PV Curve Analyzer	1	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	
20	Regulated DUAL DC power Supply	4	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	
21	Single Phase Resistive	5	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	
22	Three Phase Resistive	4	50	Govt. Engineering College Bikaner, Karni Industrial area pugal road, Bikaner	

2. Government of India has received a credit from the International Development Association (IDA) towards the cost of the **Technical Education Quality Improvement Programme[TEQIP]-Phase III** Project and intends to apply part of the proceeds of this credit to eligible payments under the contract for which this invitation for quotations is issued.
3. Quotation,
   - 3.1 The contract shall be for the full quantity as described above.
   - 3.2 Corrections, if any, shall be made by crossing out, initialing, dating and re writing.
   - 3.3 All duties and other levies payable by the supplier under the contract shall be included in the unit price.
   - 3.4 Applicable taxes shall be quoted separately for all items.
   - 3.5 The prices quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.
   - 3.6 The Prices should be quoted in Indian Rupees only.

4. Each bidder shall submit only one quotation.
5. Quotation shall remain valid for a period not less than **55** days after the last date of quotation submission.
6. Evaluation of Quotations,
   The Purchaser will evaluate and compare the quotations determined to be substantially responsive i.e. which
   6.1 are properly signed ; and
   6.2 confirm to the terms and conditions, and specifications.
7. The Quotations would be evaluated for all items together.
8. Award of contract:
   The Purchaser will award the contract to the bidder whose quotation has been determined to be substantially responsive and who has offered the lowest evaluated quotation price.
   8.1 Notwithstanding the above, the Purchaser reserves the right to accept or reject any quotations and to cancel the bidding process and reject all quotations at any time prior to the award of contract.
   8.2 The bidder whose bid is accepted will be notified of the award of contract by the Purchaser prior to expiration of the quotation validity period. The terms of the accepted offer shall be incorporated in the purchase order.
9. Payment shall be made in Indian Rupees as follows:
   Delivery and Installation - 90% of total cost

   Satisfactory Acceptance - 10% of total cost

10. All supplied items are under warranty of **36** months from the date of successful acceptance of items.
11. You are requested to provide your offer latest by **12:00** hours on **15-Feb-2019 .**
12. Detailed specifications of the items are at Annexure I.
13. Training Clause (if any) **yes**
14. Testing/Installation Clause (if any) **yes**
15. Information brochures/ Product catalogue, if any must be accompanied with the quotation clearly indicating the model quoted for.
16. Sealed quotation to be submitted/ delivered at the address mentioned below,
    karni Industrial Area , Pugal Road, Bikaner Rajasthan
17. We look forward to receiving your quotation and thank you for your interest in this project.

ON BEHALF OF-

Govt. Engineering College Bikaner

Annexure I

Sr. No	Item Name	Specifications
1	Boost Converter	current rating 25 A, Input Voltage 230V, output voltage adjustable between 230V to 400V, Switching frequency range 1-25kHz, Switch type IGBT, All switches should be protected with proper snubber circuit, rated and saturation current ratings of the inductors (used in boost converter ckt) should be 25A.
2	Buck Boost Converter	current rating 25 A, Input Voltage 310V, output voltage adjustable between 200V to 400V, Switching frequency range 1-25kHz, Switch type IGBT, All switches should be protected with proper snubber circuit, rated and saturation current ratings of the inductors (used in boost converter ckt) should be 25A.
3	Buck Converter	current rating 25 A, Input Voltage 310V, output voltage adjustable between 0V to 300V, Switching frequency range 1-25kHz, Switch type IGBT, All switches should be protected with proper snubber circuit, rated and saturation current ratings of the inductors (used in boost converter ckt) should be 25A.
4	Capacitive load	Voltage: 230V AC +/-10%, 50Hz, Current 10A (Approx.) Loading steps: 12 1000Micro Farad with suitable tappings
5	Current Probe	AC/DC current Probe, Input 0 to 70A RMS/ 100A Peak AC or DC , Frequency - DC to 100 kHz (@ 3dB) , Output 10mV/A, 100mV/A, CAT III, Working Voltage 600V, Battery 9V.
6	Differencial Probe	25 MHz high-voltage differential probe 1. 5 MHz bandwidth 2. User-able attenuation settings of 10:1 or 100:1 3. Rated to measure differential and common mode voltage up to ±700 V at 100:1 mode 4. Powered by included 4x AA batteries or USB host port of scope or PC
7	Digital Storage Oscilloscope	Digital Storage oscillocope (2 Channels with bode plot drawing features) 1. Digital Storage Oscilloscope with built in 20MHz Function Generator Digital Storage Oscilloscope with built in 20MHz Function Generator Bandwidth :50 MHz Number of Channel :2 Analog Channel Sampling Rate :1 GS/s all Channels Time Base Range :5ns/div to 50 sec/div Memory Depth :100kpts Acquisition Rate : = 50,000 per second Coupling : AC, DC Input Impedance :1 MO ± 2%/16 pF ±3 pF Vertical Sensitivity :500µV/Div to 10 V/div Vertical Resolution :8 Bits Display : =7 inch Trigger ion : Edge, pulse width, video, pattern/state Digital Voltmeter and Frequency Counter : Digital voltmeter and 5 – digit frequency

		counter upto scope bandwidth should be available Automatic Measurement : More than 20+ automatic measurement function should be available alongwith math function, FFT plot with dBV Vs frequency should be available Training Signal : Different types of training signal should be available built – in with lab guide, tutorials and content on Oscilloscope fundamentals Function Generator :20MHz function Generator with 20Vpp Square, Pulse Ramp & 12Vpp Sine wave. With AM, FM & FSK modulation feature should be available. The feature to plot the gain Vs phase plot should be available with built – in WaveGen to sweep from 20 Hz up to 20 MHz FRA- Frequency Response for Bode plot should be there Operating Temperature : Operating: 0 to 50° C Passive Probes :2 Passive Probe should be provided with oscilloscope and have able 10:1 and 1:1 attenuation. Serial Decodes (Optional) : I^2C and UART Option should be available for future upgradable(Optional) PC Connectivity and Software : USB connectivity and software (optional) should have feature to control & visualize multiple measurement simultaneously and data logging upto 1-hour. Warranty : Should have standard 3 Years warranty
8	Electronic Power Supply	Electronic Power Supply (0-30V DC,+/- 15V, +/-5V outputs with 2 A) Technical Specification Three Channel DC Output -:0 to 30V / 2A , 0 to ± 15V /1A tracking,5V/5A Setting Resolution -: V : 10mV, I : 5 mA Constant Voltage Mode Load Regulation (for load changes from zero to full load) CV: = ± 0.05% CC : = ± 0.2% Line Regulation (for 10% change in line voltage) CV : = ± 0.05% CC : = ± 0.2% Ripple & Noise -: < 1mVrms Current Limit adjustment -:100mA to max. Temperature Coefficient -: = ± (0.05% +10mV/°C) Stability -: = 2.5mV at full load Protection Built in Protection against Overload, Over heat, Over voltage & short circuit should be provided Recovery time -: < 50µs Insulation -: Chassis to output > 10MO at 100VDC Chassis to AC Plug > 50MO at 500VDC Digital Display -: Switchable, 3 digit seven segment LED for Voltage & current Input Supply -: 230V AC ± 10%, 50-60Hz Operating Temperature -: 0 to 50ºC
9	Experimental setup for Single Phase PWM AC controller	Single Phase PWM AC power controller test setup, capable of operating in adjustable switching frequency from 1kHz to 12 kHz using PWM technique with adjustable duty Ratio of 0.1 to 0.9 and the controller should be capable to feed an adjustable AC power to 1 phase AC loads, The flow of power should be controlled using the pulse width modulation control technique. • Output Current Rating : 30 Amp RMS (AC) • Input Voltage (fixed at any value between) : 0-230 V RMS (AC) • Adjustable Output Voltage Range (adjustable at any value which is less than the input voltage): 0-230 V DC • Switch Type : Fully-Controlled type IGBT Switching • All power electronic switches (IGBTs) of the power converter of the Three Phase PWM AC power controller test setup should operate up to 15 kHz. • Single Phase PWM AC power controller test

		setup must be capable of driving Resistive Loads. • Single Phase PWM AC power controller test setup must have appropriate snubber protection of Switching Devices. • Access points should be available for Intermediate signaling points of the control and power circuit of the Single Phase PWM AC power controller test setup, for the analysis purpose as per the requirement of the lab authorities. • Access points must be available on the front panel to register the transient changes in the system during the sudden load changes and dynamic situations. The encloser of test setup should be fully transparent with metal base for better academic value addition and for better understanding of the students about the system. • The output voltage control settings must be available on the front panel of the test setup. Supplier has to give warranty of the system for 3Years. • Additional Testing Points on the main Control Panel taken from the Single Phase PWM AC power controller may be added by the technical members of the committee. Converter will also used for Research Purpose in laboratory therefore during the finalization of Bid, technical experts may ask to provide additional testing points on the panel. No addition payment/cost will be given for it. • Proper isolation between control and power circuit must be provided in the Three Phase PWM AC power controller test setup. • Firm must submitted the design of the outer panel along with the Bid-document. • The experimental test reports (hardware results recorded on power analyzer) of the Single Phase PWM AC power controller test setup including waveforms (source and load side) of voltage & currents at different values of duty cycle along with the tabulated values of voltage, current, power, PF, Crest factor , active power, reactive power, THD in output voltage, THD in output current, THD in Source Current at different values of duty cycle (at least at five different duty cycle at suitable intervals) must be attached along with the Bid-documents. • If the above said experimental reports of the Single Phase PWM AC power controller test setup will not be found attached along with the Bid-documents of any party/firm/company/vendor (participating in tendering process), the Bid-document of that firm will be cancelled (not considered) immediately at the time of the opening of the tender. • The detailed brochure of the quoted item with complete technical details/specification along with make & model number must be attached with the Bid-document otherwise Bid-document will not be considered. • The technical members of the purchase committee may also ask any firm for the demonstration of the Single Phase PWM AC power controller test setup before finalization of the Bid, within 3 days after opening of the tender. The cost for the demonstration will be bear by the supplier. If any firm will be fails to demonstrate the system/item successfully (within 3days from the opening date of the tender) which is quoted by them , the Bid of that firm will be cancelled. • The real time experimental values of the output voltage, input

		voltage must be displayed on the panel board using suitable meters. Scanned Copies of all the experimental test reports as mentioned in the Technical Specification must be uploaded/attached otherwise Bid, will be rejected. • Scanned Copies of all the experimental test reports as mentioned in the Technical Specification must be uploaded/attached otherwise Bid will be rejected.
10	Experimental setup for Single Phase PWM Inverter	Single Phase Single Pulse PWM Inverter Test setup Single Phase Single Pulse PWM Inverter Test setup, capable of converting AC voltage in to adjustable DC voltage for DC bus than convert this DC Voltage into Single Pulse PWM AC voltage using adjustable single pulse PWM technique. The system should be capable of operating in adjustable switching frequency from 45Hz to 200 Hz using PWM technique with adjustable duty Ratio of 0.1 to 0.9 and the controller should be capable to feed an adjustable AC power to 1 phase AC loads, The flow of power should be controlled using the single pulse width modulation control technique. • Output Current Rating : 25 Amp RMS (AC) • Input Voltage (fixed at any value between) to the system : 230 V RMS (AC) DC bus voltage:- Adjustable Between 20V to 300V DC (Range of the variation in DC bus voltage depends on input AC voltage fed to the input side of single phase controlled rectifier) • Adjustable Output Voltage Range (adjustable at any value which is less than the input voltage): 10-220 V AC • Switch Type : Fully-Controlled type IGBT Switching • All power electronic switches (IGBTs) of the power converter of the Single Phase Single Pulse PWM Inverter Test setup should operate up to 15 kHz. • Single Phase Single Pulse PWM Inverter Test setup must be capable of driving Dynamic, R-L & Resistive Loads. • Single Phase Single Pulse PWM Inverter Test setup must have appropriate snubber protection of Switching Devices. • Access points should be available for Intermediate signaling points of the control and power circuit of the Single Phase Single Pulse PWM Inverter Test setup, for the analysis purpose as per the requirement of the lab authorities. • Access points must be available on the front panel to register the transient changes in the system during the sudden load changes and dynamic situations. The encloser of test setup should be fully transparent with metal base for better academic value addition and for better understanding of the students about the system. • The output voltage control settings must be available on the front panel of the test setup. Supplier has to give warranty of the system for 3 Year. • Additional Testing Points on the main Control Panel taken from the Single Phase Single Pulse PWM Inverter Test setup may be added by the technical members of the committee. Converter will also used for Research Purpose in laboratory therefore during the finalization of Bid, technical experts may ask to provide additional testing points on the panel. No addition payment/cost will be given

		for it. • Proper isolation between control and power circuit must be provided in the Single Phase Single Pulse PWM Inverter Test setup. • Firm must submitted the design of the outer panel along with the Bid-document. • The experimental test reports (hardware results recorded on power analyzer) of the Single Phase Single Pulse PWM Inverter Test setup including waveforms (source and load side) of voltage & currents at different values of duty cycle along with the tabulated values of voltage, current, power, PF, Crest factor , active power, reactive power, THD in output voltage, THD in output current, THD in Source Current at different values of duty cycle (at least at five different duty cycle at suitable intervals) must be attached along with the Bid-documents. • If the above said experimental reports of the Single Phase Single Pulse PWM Inverter Test setup will not be found attached along with the Bid-documents of any party/firm/company/vendor (participating in tendering process), the Bid-document of that firm will be cancelled (not considered) immediately at the time of the opening of the tender. • The detailed brochure of the quoted item with complete technical details/specification along with make & model number must be attached with the Bid-document otherwise Bid-document will not be considered. • The technical members of the purchase committee may also ask any firm for the demonstration of the Single Phase Single Pulse PWM Inverter Test setup before finalization of the Bid, within 3 days after opening of the tender. The cost for the demonstration will be bear by the supplier. If any firm will be fails to demonstrate the system/item successfully (within 3days from the opening date of the tender) which is quoted by them , the Bid, of that firm will be cancelled. • The real time experimental values of the output voltage, input voltage must be displayed on the panel board using suitable meters. Scanned Copies of all the experimental test reports as mentioned in the Technical Specification must be uploaded/attached otherwise Bid, will be rejected. • Scanned Copies of all the experimental test reports as mentioned in the Technical Specification must be uploaded/attached otherwise Bid will be rejected.
11	Experimental setup for Three Phase PWM AC controller	Three Phase PWM AC power controller test setup, capable of operating three phase mode of operations and the controller should be capable to control the flow of AC power from 3 phase load to 3 phase star connected with floating Neutral/ star connected with Neutral connected/Delta Connected resistive loads using PWM techniques. The test system should also be capable of feeding to single phase loads. The flow of power should be controlled using the pulse width modulation control technique. • Output Current Rating : 35 Amp/phase RMS (AC) • Input Voltage (fixed at any value between) : 200-415 V RMS (AC) • Adjustable Output Voltage Range (adjustable at any value which is less than the

		input voltage): 200-415 V RMS (AC) • Switch Type : Fully-Controlled type IGBT Switching • L-C Filter should be incorporated. • All power electronic switches (IGBTs) of the power converter of the Three Phase PWM AC power controller test setup should operate up to 10 kHz. • Three Phase PWM AC power controller test setup must have appropriate snubber protection of Switching Devices. • Access points should be made available for Intermediate signaling points of the control and power circuit of the Three Phase PWM AC power controller test setup, for the analysis purpose as per the requirement of the lab authorities. • Access points must be available on the front panel to register the transient changes in the system during the sudden load changes and dynamic situations. The encloser of test setup should be fully transparent. • Output voltage control settings must be available on the front panel of the test setup. Supplier has to give warranty of the system for 3 Year. • Additional Testing Points on the main Control Panel taken from the Three Phase PWM AC power controller may be added by the technical members of the committee. Converter will also used for Research Purpose in laboratory therefore during the finalization of Bid, technical experts may ask to provide additional testing points on the panel. No addition payment/cost will be given for it. • Proper isolation between control and power circuit must be provided in the Three Phase PWM AC power controller test setup. • Firm must submitted the design of the outer panel along with the Bid-document. • The experimental test reports (hardware results recorded on power analyzer) of the Three Phase PWM AC power controller test setup including waveforms (source and load side) of voltage & currents at different values of duty cycle along with the tabulated values of voltage, current, power, PF, Crest factor , active power, reactive power, THD in output voltage, THD in output current, THD in Source Current at different values of duty cycle (at least at five different duty cycle at suitable intervals) must be attached along with the Bid-documents. • If the above said experimental reports of the Three Phase PWM AC power controller test setup will not be found attached along with the Bid-documents of any party/firm/company/vendor (participating in tendering process), the Bid-document of that firm will be cancelled (not considered) immediately at the time of the opening of the tender. • The detailed brochure of the quoted item with complete technical details/specification along with make & model number must be attached with the Bid-document otherwise Bid-document will not be considered. • The technical members of the purchase committee may also ask any firm to demonstrate the Three Phase PWM AC power controller setup before finalization of the Bid, within 3 days after opening of the tender. The cost for the demonstration will be bear by the supplier. If any firm fails to successfully demonstrate the system (within 3days from the opening date of the

		tender) quoted by them , the Bid of that firm will be cancelled. • The real time experimental values of the output voltage, input voltage must be displayed on the panel board using suitable meters. • Scanned Copies of all the experimental test reports as mentioned in the Technical Specification must be uploaded/attached otherwise Bid will be rejected.
12	Experimental setup for Zero Current Switching	IGBT/MOSFET Switch operating in zero current switching mode in DC-DC converter, Switching Current up to 5A, Switching voltage 0-230V, Switching Frequency up to 20KHz. there it should be provision for test points to record the zero current switching on DSO.
13	Experimental setup for Zero Voltage Switching	IGBT/MOSFET Switch operating in zero voltage switching mode in DC-DC converter, Switching Current up to 5A, Switching voltage 0-230V, Switching Frequency up to 20KHz. there it should be provision for test points to record the zero voltage switching on DSO.
14	Inductive Load	0-25 mH (with different tapings at 2, 4, 6, 8, 10, 16 25 mH), the inductor should be properly fitted on metallic clips, the output terminals should be mounted at top of the inductor load on a Bakelite sheet, saturation current rating 25A, Rated current rating 25A, CRGO laminations Core, Properly wounded with Copper wire, Properly insulated winding layers using proper insulating material.
15	LCR Meter	• 20,000 counts resolution • 0.2% accuracy • Wide LCR ranges with 5 able test frequencies (100Hz, 120Hz and 1kHz, 10kHz and 100kHz) Measurement range • Resistance : 2? - 200M? • Capacitance: 20pF – 20mF •Inductance: 20µH – 2000H • Auto identification(Ai) which automatically determines and displays component type and measurements • Detailed component analysis with DCR, ESR, Z, D, Q, ? functions Battery life of 16 hours/Ac-powered
16	LCR Meter(100khz)	Comprehensive range of functions, L, C, R, Z, Q, D, theta Measurement accuracy 0.25% Test frequency standard 100 Hz / 1 kHz Series or parallel mode Auto ranging & Auto computing Low accuracy prompt 4 point measurement technique Front panel zero compensation Measurement Modes : Auto/ Manual L, C, R, Z, Q, D, q Equivalent Circuit : Series or Parallel Measurement Ranges : Auto or Manual L : 0.1 mH to 9999 H, Resolution 0.1 mH C : 0.1 pF to 9999 mF, Resolution 0.1 pF R : 0.001 W to 100 MW, Resolution 0.001 W Z : 0.001 W to 100 MW, Resolution 0.001 W Q : 0 to 99 D : 0 to 10 ? : -180 to +180 Test Conditions Test Frequency : 100 Hz/ 1 kHz Test voltage : 0.3 Vrms Measurement Speed : 2 Meas/ sec Measurement Accuracy : ± 0.25% ± 1 digit, accuracy varies with range & frequency ed, (after 30 min. warm up period) Accuracy of Test Frequency : 0.025% Condition For Basic Accuracy L : 2 mH to 2000 H, Q > 10, at

		100 Hz : 200 mH to 200 H, Q > 10, at 1 kHz C : 2 nF to 2000 mF, D < 0.1, at 100 Hz : 200 pF to 200 mF, D < 0.1, at 1 kHz R : 1 W to 2 MW, Q < 0.1, at 100 Hz : 1 W to 2 MW, Q < 0.1, at 1 kHz Connection : 4-wire Kel v in on BNC guarded connector for probes & fixtures connections
17	Lux Meter	• DATA HOLD • Auto Power OFF • Range of LUX-0~2,00,000 LUX • Accuracy: +5% of reading • Receiving light: Silicon of photo electricity diode • Power Source: 1x9.0V (6F22) • Standard Accessories : Soft carrying case, Manual • Dimension : Photo Detector : 82(H) x 55(W) x 7(D)mm • Meter Body : 148(H) x 70(W) x 40(D)mm
18	Power Factor Corrected controller based PMBLDC Drive	Domestic PMBLDC Drive set should consists of two identical two Domestic PMBLDC machines which are mechanically coupled in a proper manner. Both the Domestic PMBLDC machines should be of 600 W, along with separate inverter controllers for each machine. Whole set up should be placed on an electrically insulated synthetic rubber sheet. Note*: Since this setup will be used for research, study analysis purpose. The supplier firm has to make all the changes and modifications in the electrical connections and mechanical arrangements of the test setup as per the directions and requirement of the technical expert of the purchase committee.
19	PV Curve Analyzer	Output Voltage 0-50 V DC Output Current 0-20 A DC Output Power 0-1000W Line Regulation Voltage +/- 0.1% Current +/- 0.1% Load Regulation Voltage +/- 0.1% Current +/- 0.1% Voltage Measurement Range 0-50 V DC Accuracy 0.1% Current Measurement Range 0-20A 6A / 15A Accuracy 0.1% Output Noise&Ripple Voltage Noise(P-P) 800 mV Voltage Ripple(rms) 650 mV Current Ripple(rms) 800 mA OVP Adjustment Range Range 0-100% programmable from front panel, remote digital inputs . Accuracy +/-1% offull-scale output Programming Response Time Fall Time: No Load 500ms Slew Rate Control Voltage Slew Rate Range 0.1V/ms - 15V/ms Current Slew Rate Range 0.1A/ms - 1A/ms Programming & Measurement Resolution Voltage (Front Panel) 100 mV Current (Front Panel) 10mA Programming Accuracy Voltage (Front Panel and Digital Interface) 1% of Vmax Current (Front Panel and Digital Interface) 0.3% of Imax Voltage (Analog Interface) 1% of Vmax Current (Analog Interface) 0.3% of Imax PV Curve Analyzer should be capable of working as PV Simulator
20	Regulated DUAL DC power Supply	(0-30V DC,+/- 12V, +/-5V outputs with 2 A) Technical Specification Three Channel DC Output -:0 to 30V / 2A , 0 to ± 15V /1A tracking,5V/5A Setting Resolution -: V : 10mV, I : 5 mA Constant Voltage Mode Load Regulation (for

		load changes from zero to full load) CV: = ± 0.05% CC : = ± 0.2% Line Regulation (for 10% change in line voltage) CV : = ± 0.05% CC : = ± 0.2% Ripple & Noise -: < 1mVrms Current Limit adjustment -:100mA to max. Temperature Coefficient -: = ± (0.05% +10mV/°C) Stability -: = 2.5mV at full load Protection Built in Protection against Overload, Over heat, Over voltage & short circuit should be provided Recovery time -: < 50µs Insulation -: Chassis to output > 10MO at 100VDC Chassis to AC Plug > 50MO at 500VDC Digital Display -: Switchable, 3 digit seven segment LED for Voltage & current Input Supply -: 230V AC ± 10%, 50-60Hz Operating Temperature -: 0 to 50ºC
21	Single Phase Resistive	Voltage: 240V AC +/-10%, Current: 15A, Power 5kW, Loading steps: 12.
22	Three Phase Resistive	Voltage: 415V AC +/-10%, Current 5A (per Phase), Power: 10 kW, Loading steps 4 (per Phase).

FORMAT FOR QUOTATION SUBMISSION

(In letterhead of the supplier with seal)

Date: _____

To:

_____

_____

Sl. No.	Description of goods (with full Specifications)	Qty.	Unit	Quoted Unit rate in Rs. (Including Ex Factory price, excise duty, packing and forwarding, transportation, insurance, other local costs incidental to delivery and warranty/ guaranty commitments)	Total Price (A)	Sales tax and other taxes payable	
						In %	In figures (B)
Total Cost							

Gross Total Cost (A+B): Rs. _____

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

We confirm that the normal commercial warranty/ guarantee of ——————— months shall apply to the offered items and we also confirm to agree with terms and conditions as mentioned in the Invitation Letter.

We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in bribery.

Signature of Supplier

Name: _____

Address: _____

Contact No: _____