



Engineering College, Ajmer
(An Autonomous Institute of Govt. of Rajasthan)
N.H.8 , Barliya Circle, Near Nareli Temple, Ajmer

INVITATION LETTER

Package Code: TEQIP-III/2019/RJ/GECA/99

Current Date: 20-Sept.-2019

Package Name: GECA/TEQIP-III/2019-20/EIC-Analog and Digital
Comm. Lab

Method: Shopping Goods

To,0

M/s

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Sub: Invitation Letter For GECA/TEQIP-III/2019-20/ECE- EIC-Analog and Digital Comm. Lab.

Dear Sir,

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

S. N.	Item Name	Quantity	Place of Delivery	Installation Requirement
1	Amplitude modulated/ Demodulation Trainer Kit	1	Engg. College, Ajmer N.H. 8,Barliya Circle, Near Nareli Temple, Ajmer	Onsite installation and testing & commissioning required.
2	Amplitude Modulated, Harmonic analysis Kit	1		
3	SSB, DSB Modulated /demodulated kit	1		
4	FM Modulated/demodulated kit	1		
5	Verification of Sampling Theorem kit.	1		
6	Super heterodyne receiver kit.	1		
7	PAM, PWM & PPM: Modulation and demodulation Kit	1		
8	TDM-PAM Trainer kit.	1		
9	PCM modulation & demodulation kit	1		
10	4 channel PCM multiplexing & de-multiplexing kit.	1		
11	Delta & Adaptive delta modulation & demodulation experimental setup	1		
12	Kit to perform the experiment of generation and study the various data formatting schemes (Unipolar, Bipolar, Manchester, AMI etc.)	1		
13	ASK, FSK, BPSK, DBPSK signals analysis kit	1		

- 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, initialling, 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 **90** 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:

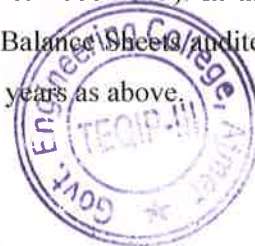
Satisfactory Delivery & Installation - 90% of total cost

Satisfactory Acceptance - 10% of total cost

10. Liquidated Damages will be charged at the rate of 0.01 % per day on pre tax billing amount if delivery period exceeds 45 days. Purchase Order shall be understood cancelled automatically without any prior notification if delivery period exceeds 60 days.



11. All supplied items are under warranty of **36** months from the date of successful acceptance of items and AMC/Others.
12. You are requested to provide your offer latest by **12:30** hours on **09-October-2019**, the quotation received within stipulated date and time shall be opened on **09-October.-2019 at 1:00 PM**.
13. Detailed specifications of the items are at Annexure I. Any Deviation from specification should be highlighted in the bid.
14. Training Clause (if any) : Basic and Advance (full functioning) with maintenance training on-site required.
15. Testing/Installation Clause (if any) **Onsite installation and testing & commissioning required. The vendor should visit the site to understand the installation requirement.**
16. Performance Security shall be applicable: **5% of pre tax billing amount**
17. Purchase Order awarded bidder shall furnish one performance security of 5% of contract value (pre tax billing amount) in the form of bank guarantee valid for 39 months from the scheduled date of completion of assignment.
18. Information brochures/ Product catalogue, if any must be accompanied with the quotation clearly indicating the model quoted for.
19. The bidder must submit their financial bid in the prescribed format (Annexure-2) and no other format is acceptable.
20. The bidder shall quote only one specific make/model from only specific OEM for each of the goods. Bid will be rejected if bidder provide more than one make/model for an item/good.
21. Vendor/bidder must submit two bids concurrently, i.e technical bid and financial bid, with proper marking on envelopes. Financial bids shall be opened of only those bidders who have been declared technically qualified by the Purchase Committee.
22. The qualification criteria for technical bid shall be following (The envelope marked for technical bid must contain all the supporting documents):
 - I. Only authorized dealer/ agency of Original Equipment Manufacturer (OEM) or OEM should apply against this invitation for bid. In the case of the bidder, offering to supply goods under the bid, which the bidder does not manufacture or otherwise produce, the bidder has to provide Manufacturer's Authorization Certificate for each item (excluding services) strictly as per format at Annexure -3. Bids submitted without authorization certificate for each item (excluding services) as per Annexure-3 will be summarily rejected.
 - II. The average turnover of the bidder quoting for the bid should be Rs. 15.50 Lakhs during the last three financial years (2016-2017, 2017-2018 & 2018-2019). In this regard, the bidder should submit CA certificate and last three years Balance Sheets audited by a CA including profit and loss accounts for the last three financial years as above.



III. OEM Firm or bidder must have executed at least :

One single order of similar items having value of Rs. 1.24 Lakhs

(OR)

Two orders of similar items having value of Rs.0.77 Lakhs.

(OR)

Three orders of similar items having value of – Rs. 0.62 Lakhs.

{Here,*similar means 'supply and installation of **Analog and Digital Comm. Lab. / Multi Purpose Instruments** for any Govt. Dept/PSU/reputed organization in the last three years i.e. 2016-2017, 2017-2018 & 2018-2019 till the date of invitation letter.

Copies of purchase order and successful work completions certificate must be submitted.}

IV. Bidder must submit the latest GST Registration Certificate along with clearance status of 'no dues' of GST.

V. The bidder has not been blacklisted by Central Govt./State Govt./PSUs/Autonomous bodies. Further, the bidder has neither filed any litigation against Central/State Govt. nor declared "no performer" by Govt./State Govt./PSUs/Autonomous bodies. An affidavit must be submitted by the bidder.

VI. The OEM firm of each item should have the valid ISO 9001:2015 and/or ISO14001:2015 certification (copies of ISO certificate(s) to be submitted.)

VII. Compliance sheet of technical specification of each item (in the order as given in Annexure 1) should be provided.

VIII. A Confirmation letter as per format at Annexure-4 on firm's letterhead that the bidder will provide normal Commercial warranty/guarantee of 36 months on all supplied items, and agrees with the terms & conditions mentioned in the invitation letter.

23. The purchase committee has full power to take any decision for the tender or quotation.

24. Sealed quotation to be submitted/ delivered at the address mentioned below, **Principal, Engineering College, Ajmer, N.H.8 , Barliya Circle, Near Nareli Temple, Ajmer**

25. We look forward to receiving your quotation and thank you for your interest in this project.

Dr. U. S. Modani

Principal



Annexure I

S. No	Item Name	Specifications
1	Amplitude modulated/ Demodulation Trainer Kit	<p>Observe the Amplitude modulated wave form & measure modulation index and demodulation of AM signal. Amplitude modulation is implemented by means of a variable transconductance four quadrant multiplier designed around CA3086. On board carrier and modulating signals along with power supplies are provided. A detector and a low pass filter are provided to demodulate the signal. Modulation Index, Depth of Modulation, etc., are studied using this trainer.</p> <p>HARDWARE SPECIFICATION :</p> <ul style="list-style-type: none"> * Carrier Generator 100 KHz * Modulating signal Generator at 1 KHz * Amplitude Modulator * Amplitude Demodulator * Inbuilt Power Supply * Enclosed in an ABS plastic cabinet with cover <p>Set of 2mm Patch Chords & Manual.</p>
2	Amplitude Modulated, Harmonic analysis Kit	<ul style="list-style-type: none"> * Harmonic Generation Technique : Direct Digital Synthesis. * Eleven Input Summing Amplifier * Fundamental Frequency : 1 KHz. * Harmonics Generation : 9 Harmonics, ranges from 2 KHz to 10 KHz. Controllable gain for individual frequency component domain. Digital Phase control of relative phases between fundamental and harmonics. * On Board Wave forms : 0°(sine), 90°(cosine), 180°(-sine), 270°(- cosine). * Waveform level (max) : 5Vpp (Approximately) * Weight : 2 Kg (Approximately) * Dimension (mm) : W 365 ´ D 260 ´ H 75 * Mains Supply : 230V ±10%, 50Hz . 60 Hz on request * DC constant generation : - 5 V to +5 V (Approximately)
3	SSB, DSB Modulted /demodulted kit	<ul style="list-style-type: none"> * On board variable frequency audio oscillator, Carrier freq generator * On board DSB & SSB Modulator, Band Pass filter, 455 KHz Generator, Audio & RF Amplifiers Transmitting Antenna, Speaker & Headphones, Generation & Demodulation of DSB – SC signal. <p>Technical Specifications :</p> <ul style="list-style-type: none"> * Audio Oscillator (Sine Wave Generator): * Frequency : 300 Hz to 3.4 KHz * Amplitude : 0 to 2 Vp-p * Audio Input : Audio Pre-amplifier with microphone input. * Audio Input : Audio Pre-amplifier with microphone. <p>Voltage Control Oscillator (VCO) : * Output Signal : Sine Wave</p>
4	FM Modulated/ demodulated kit	<ul style="list-style-type: none"> * Audio Oscillator : With adjustable Amplitude & Frequency (300Hz to 3.4 KHz), Modulate a sinusoidal signal with high frequency carrier to obtain FM signal and demodulation of the

		<p>FM signal.</p> <ul style="list-style-type: none"> * FM Modulators : 2 Nos. - Reactance Modulator (With Carrier Freq. Adjustment) - Varactor Modulator (With Carrier Frequency Adjust) * Mixer/Amplifier : 1 No, (With Gain Adjustment) Allows FM Input to be Amplitude Modulated by Noise Input Prior to demodulation. * Transmitter O/P Frequency : 455 KHz * FM Demodulator : 1) Detuned Resonant Detector 2) Quadrature Detector 3) Foster Seeley Detector 4) Ratio Detector 5) Phase Locked Loop Detector * Low Pass Filter / Amplifier : 3.4 KHz cutoff Frequency (With Adjustable Gain) * Amplitude Limiter : 1 No. * Switched Faults : 8 Nos. * Test Point : 74 * Test Point : 50 * Power Supply : Built In 230V \pm 10% / 50Hz * Accessories Included : Line Cord, Manuals, Patch Cords.
<p>5</p>	<p>Verification of Sampling Theorem kit.</p>	<ul style="list-style-type: none"> * Crystal controlled Pulse Generator * Demonstrates Sampling and Reconstruction * On board Analog Generator * Selectable Sampling Frequencies * Sampling Pulse Duty cycle selectable * Internal/external sampling input selectable * Separate Sample and Sample/Hold outputs. * On-board 2nd order and 4th order L.P. Filters. * Crystal frequency: 6.4 MHz * Sampling frequency: 2, 4, 8, 16 & 32 KHz (switch selectable) * On board Generator: Synchronized 1 KHz sine wave (5 Vp-p) * Duty Cycle: 0.90% in Decade steps (switch selectable) * L.P. Filters : Butter worth 2nd & 4th order filter cut off frequency 3.4 KHz * Inbuilt Power Supply * Assembled in ABS plastic cabinet with cover * Set of Patch Chords & Experimental Manual.
<p>6</p>	<p>super heterodyne receiver kit.</p>	<ul style="list-style-type: none"> * Used for AM reception. * Fault creation to understand block of super heterodyne reception. * Circuit diagram display on the PCB. * Self contained unit to understand and demonstrate principle of super hetrodyne receiver. * Characteristics & alingment features. * Adjustment and control at all stages. * Power : 230V, +/-10%, 50Hz * Accessories : User's Manual with experimental book and patch cords



<p>7</p>	<p>PAM, PWM & PPM; Modulation and demodulation Kit</p>	<ul style="list-style-type: none"> * Pulse Amplitude Modulation * Pulse Width Modulation * Pulse Position Modulation * On-board Sampling Frequencies (Pulse):- 8KHz, 16KHz, 32KHz, 64KHz * On-board Generator:- <ol style="list-style-type: none"> 1. Sine Wave:- 1KHz & 2KHz (Gain adjustable) 2. Square wave:- 1KHz & 2KHz (optional) * Low Pass Filter: 4m order VW Filter * Voice Communication: Voice link using dynamic mic & speaker AC Amplifier with adjustable gain control DC Out put: 0-4 V(variable) * Switched faults : 8 nos. * Interconnections:- 4mm banana sockets * Test Points: 29 * Power Supply: 220V \pm10%, 50Hz * included:- Manual , Set of Patch cords, Line Cord, Microphone, Head Phone
<p>8</p>	<p>TDM-PAM Trainer kit.</p>	<ul style="list-style-type: none"> * Crystal Frequency : 6.4 MHz * Analog Input Channel: 4 * Multiplexing: Time Division Multiplexing * Modulation: Pulse Amplitude Modulation * On board Analog Signal: 250Hz 500Hz 1 KHz & 2 KHz * Sampling Rate: 16 KHz/ channel * Sampling Pulse : With Duty Cycle variable from 0 – 19% in steps * Clock Re-generation at Receiver: Using PLL * Low Pass filter cut-off frequency : 3.4 KHz * Test Points : 52 * Power : 220 Volt \pm10%, 50Hz * Inbuilt Power Supply
		<ul style="list-style-type: none"> * Assembled in ABS plastic cabinet with cover * Set of Patch Chords & Experimental Manual, (To observe the transmission of four signals over a single channel using TDM-PAM method).
<p>9</p>	<p>PCM modulation & demodulation kit</p>	<ul style="list-style-type: none"> * It has facility to generate the binary code of input signal, using analog to digital converter and time division multiplexing of two such PCM data stream, To study the PCM modulation & demodulation and study the effect of channel like attenuation, noise in between modulator & demodulator through the experimental setup. * Input channels : 2 Nos. Time-division multiplexed, Pulse code modulated * Onboard signals : 1KHz, 500 Hz variable amplitude synchronised sinewaves; Two variable amplitude DC levels * Synchronization signal : Pseudo random code generation * Parity code facility : Even, Odd, Hamming, No Parity * Switch Fault mode : Facility to create signal bit error using DIP switch



		<ul style="list-style-type: none"> * LED Display : At every functional block for examination of Digital data and control signal * Mode of Operation : Fast/Slow * Interconnection : 2mm banana socket * Inbuilt Power Supply
10	4 channel PCM multiplexing & de-multiplexing kit.	<ul style="list-style-type: none"> * On-board Power Supply section * On-board clock generation. * On-board signal generation. * Audio interface for PCM coding and decoding. * Low voltage requirement for operation. * On-board test points. * Variable sampling rate as per system clock used. * Audio codec : PCM Codec Filter Mono Circuit * Inputs : Single ended * Number of bits per channel : 16 * Sampling Rate : 64, 32, 16 and 8 KHz * System clock : 128 * Sampling clock * Clock Source : On-board * Analog Signal Source : Sinusoidal * Frequency : Max. 10KHz (approximately) * Amplitude : 0 to 5 V (peak to peak) * Test Point : 29 nos. * Power Supply : +5V, +12V and -12V * Mains Supply : 230V \pm10%, 50Hz
11	Delta & Adaptive delta modulation & demodulation experimental setup	<ul style="list-style-type: none"> * The kit provides facility to examine Delta & Adaptive Modulation and Demodulation. An exhaustive manual is provided with the system, which provides detailed experimental procedure and complete circuit diagram of the system, Delta & Adaptive delta modulation & demodulation and also study the effect of channel like attenuation, noise in between modulator & demodulator through the experimental setup * Delta Modulation Techniques : Delta Modulation/Demodulation Adaptive Delta Modulation/Demodulation * Onboard sampling frequency : 8KHz, 16KHz, 32KHz, 64KHz * Onboard sine wave generator : 250Hz, 500Hz, 1KHz, 2KHz and DC level (variable Amplitude 0-5 V p-p) * Low pass filter type : 2nd & 4th order butter worth filter * Cut-off frequency : 3.4 KHz * Interconnection : Banana Post * Power Supply : +5V, +/-12V, 1Amp.
12	Kit to perform the experiment of generation and study the various data formatting schemes (Unipolar, Bipolar, Manchester, AMI etc.)	<ul style="list-style-type: none"> * It allow to study the conversion of non-return-to-zero (NRZ) waveform to six different data formats and study the modulation techniques such as ASK, FSK, PSK, QPSK * Data conditioning options : NRZ(L), NRZ(M), NRZ(S), RZ, AMI, Biphase (Manchester), Biphase (Mark), Biphase (Space) * Carrier modulation techniques : ASK, FSK, PSK, QPSK * On-board carrier signal : 2MHz sinewave, 1MHz sinewave 1MHz cosinewave * Interconnection : 2mm banana socket



13	ASK, FSK, BPSK, DBPSK signals analysis kit	<ul style="list-style-type: none">* Power Supply : +5V, +/-12V* It allow to study the conversion of non-return-to-zero (NRZ) waveform to six different data formats and study the modulation techniques such as ASK, FSK, PSK, QPSK, To perform the experiment of generation and detection of ASK, FSK, BPSK, DBPSK signals with variable length data pattern.* Data conditioning options : NRZ(L), NRZ(M), NRZ(S), RZ, AMI, Biphase (Manchester), Biphase (Mark), Biphase (Space)* Carrier modulation techniques : ASK, FSK, BPSK, DBPSK* On-board carrier signal : 2MHz sinewave, 1MHz sinewave 1MHz cosinewave* Interconnection : 2mm banana socket* Power Supply : +5V, +/-12V
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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. _____ (Amount in figures)

We agree to supply the above goods in accordance with the technical specifications for a total contract price of Rs. _____ (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. _____

Annexure 3 (Invitation)

MANUFACTURER AUTHORIZATION FORM

No. _____ dated _____

To

Dear Sir:

Package No. _____

We----- (Name of the OEM) who are established and reputed manufacturer of _____ (*name and description of goods offered*) having factories at _____ (*address of factory*) with factory registration no. -- ----- do hereby authorize M/s _____ (*Name and address of Agent*) to submit a bid, and sign the contract with you for the goods manufactured by us against the above bid.

We hereby extend our full warranty as per your invitation letter, for the goods and services offered for supply by the above firm against this Invitation for Bid.

Yours faithfully,

(Name)

(Name of manufacturers)

Note: This letter of authority should be on the letterhead of the manufacturer or OEM and should be signed by a person competent and having the power of attorney to legally bind the manufacturer.



Annexure 4 (Invitation)

Confirmation Letter

No. _____

dated _____

To

Dear Sir:

Package No. _____

We confirm that the normal commercial warranty/ guarantee of 36 months shall apply to the offered items and we also confirm to agree with terms and conditions as mentioned in the Invitation Letter.



Yours faithfully,

(Name)

(Name of manufacturers)