Engineering College, Ajmer,
N.H.8 , Barliya Circle, Near Nareli Temple, Ajmer

ECA/TEQIP-III/2019/192

PURCHASE ORDER

26-Dec-2019

Package Code: TEQIP-III/2019/RJ/GECA/99 **Current Date: 20-Dec-2019**

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

PO Reference No : TEQIP-III/2019/RJ/geca/99
Date of Issue: 20-Dec-2019
Subject : GECA/TEQIP-III/2019-20/EIC-Analog and Digital Comm. Lab

Purchaser : Engineering College, Ajmer,N.H.8 , Barliya Circle, Near Nareli Temple, Ajmer

Supplier Name: Vinytics Peripherals Pvt. Ltd.,
12-DDA, Auto Mobile Market (Truck Market) Opp. R. K. Hospital,
Near Mother Dairy Red Light Pandav Nagar Delhi-110092

With reference to our correspondence, Engineering College, Ajmer,N.H.8 , BARLIYA CIRCLE, NEAR NARELI TEMPLE, AJMER, is pleased to award this detailed Purchase Order to for supply of items as per the details given below at a total cost (Contract Value) of **Rs. 144314(In Words:One Lakh Forty Four Thousands Three Hundred Fourteen Only)**

Sr. No	Item Name	Quantity	Place of Delivery	Installation Requirement (if any)
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		

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13	ASK, FSK, BPSK, DBPSK signals analysis kit	1

Total price (without taxes) :	Rs. 122300
Total applicable taxes :	Rs. 22014
Total price (with taxes) :	Rs. 144314
Total Octroi& Other Charges :	Rs. 0
Delivery :	Engineering College, Ajmer, N.H.8 , Barliya Circle, Near Nareli Temple, Ajmer
Testing/Installation Clause (if any):	On site installation and testing & commissioning required. Price must be included in quotation.
Training Clause (if any) :	N A
Technical Specifications :	As per Annexure - 1
Delivery Period :	45 days or as early possible
Warranty (In Months):	36 Months from the date of successful acceptance of items.
Liquidated Damages :	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.
Performance Security :	Performance security amount Rs 6115 at the rate of (5 %) of the Total contract value to be submitted in form of Bank guarantee of any Nationalized. Bank only within 21 day from the date of issue of PO Bank only within 21 day from the date of issue of PO including acceptance of P.O.
Payment Terms :	Below are the payment terms- **Satisfactory Delivery & Installation - 90% of total cost** **Satisfactory Acceptance - 10% of total cost**

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Invoice Generation: The invoice has to be generated against GST No. **08AABAP0959P1ZZ** of Govt. Engineering College, Ajmer

Dr. U. S. Modani
Principal

Principal
Govt. Engineering College,
AJMER

Accepted by Signature:

Date:

Address:

Govt. Engineering College, Ajmer
TEQIP-III

Annexure I

S. No	Item Name	Specifications
1	Amplitude modulated/ Demodulation Trainer Kit	Observe the Amplitude modulated wave form & measure modulation index and demodulation of AM signal. Amplitude modulation is implemented by means of a variable trans conductance 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. HARDWARE SPECIFICATION : * 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 Set of 2mm Patch Chords & Manual.
2	Amplitude Modulated, Harmonic analysis Kit	* 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 Modulated /demodulated kit	* 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. Technical Specifications : * 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. Voltage Control Oscillator (VCO) : * Output Signal : Sine Wave
4	FM Modulated/ demodulated kit	* 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 FM signal. * 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 ± 10% / 50Hz * Accessories Included : Line Cord, Manuals, Patch Cords.
5	Verification of Sampling Theorem kit.	* 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.
6	Super heterodyne receiver kit.	* 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 & alingnment features. * Adjustment and control at all stages. * Power : 230V, +/-10%, 50Hz * Accessories : User's Manual with Experimental book and patch cords
7	PAM, PWM & PPM: Modulation and demodulation Kit	* Pulse Amplitude Modulation * Pulse Width Modulation * Pulse Position Modulation * On-board Sampling Frequencies (Pulse):- 8KHz, 16KHz, 32KHz, 64KHz * On-board Generator:- 1. Sine Wave:- 1KHz & 2KHz (Gain adjustable)

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		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 ±10%, 50Hz * included:- Manual , Set of Patch cords, Line Cord, Microphone, Head Phone
8	TDM-PAM Trainer kit.	* 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 ±10%, 50Hz * Inbuilt Power Supply * 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).
9	PCM modulation & demodulation kit	* 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 Synchronized sine waves; Two variable amplitude DC levels * Synchronization signal : Pseudo random code generation * Parity code facility : Even, Odd, Hamming, No Parity * Switch Fault mode : Facility to creat signal bit error using DIP switch * 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.	* 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.

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		* 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 ±10%, 50Hz
11	Delta & Adaptive delta modulation & demodulation experimental setup	* 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.)	* 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 * Power Supply : +5V, +/-12V
13	ASK, FSK, BPSK, DBPSK signals analysis kit	* 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

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* On-board carrier signal : 2MHz sinewave, 1MHz sinewave 1MHz cosinewave
* Interconnection : 2mm banana socket
* Power Supply : +5V, +/-12V

Annexure 2 (Purchase Order)

PERFORMANCE SECURITY FORM

To: _____ (Name of Purchaser)

WHEREAS ..... (Name of Supplier) hereinafter called "the Supplier" has undertaken , in pursuance of Contract (Notification of Award) No..... dated,..... 2019 to supply..... .....(Description of Goods and Services) hereinafter called "the Contract".

AND WHEREAS it has been stipulated by you in the said Contract that the Supplier shall furnish you with a Bank Guarantee by a Nationalized bank for the sum specified therein as security for compliance with the Supplier's performance obligations in accordance with the Contract.

AND WHEREAS we have agreed to give the Supplier a Guarantee:

THEREFORE WE hereby affirm that we are Guarantors and responsible to you, on behalf of the Supplier, up to a total of ..... (Amount of the Guarantee in Words and Figures) and we undertake to pay you, upon your first written demand declaring the Supplier to be in default under the Contract and without cavil or argument, any sum or sums within the limit of ..... (Amount of Guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This guarantee is valid until the .....day of.....2019.

Signature and Seal of Guarantors

Date.....2019.
Address:.....
.....
.....

Note: *The Bank Guarantee to be issued by nationalized bank only and is to be submitted on a non-judicial stamp paper of Rs. 100/- (One Hundred only). The non-judicial stamp paper should be purchased in the name of issuing bankers. The Issuing bank must provide its Head Office/Regional office addresses of communication*