Engineering College, Bikaner,karni Industrial Area , Pugal Road, Bikaner Rajasthan

INVITATION LETTER

Package Code: TEQIP-III/2019/RJ/gebk/83 **Current Date: 09-Dec-2019**

Package Name: ECB/TEQIPIII/ECE/Microwave **Method: Shopping Goods**

To Be Published On ECB Website

Sub: INVITATION LETTER FOR ECB/TEQIPIII/ECE/Microwave

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	Item Name	Quantity	Place of Delivery	Installation Requirement (if any)
1	X-Band Microwave Bench, complete setup with various components	1	Engineering College Bikaner, Karni Industrial Area, Pugal Road Bikaner	YES
2	S-Band Microstrip line trainer with separate variable frequency generator (S-Band), digital power meter, S-Band power amplifier(35 dB)	1	Engineering College Bikaner, Karni Industrial Area, Pugal Road Bikaner	YES

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, 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 **100**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.

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:

Payment Description	**Expected Delivery Period (in Days)**	**Payment Percentage**
Satisfactory Delivery & Installation	30	10
Satisfactory Acceptance	30	90

10. Liquidated Damages will be applied as per the below:
Liquidated Damages Per Day Min %:0.05
Liquidated Damages Max %:7

11. All supplied items are under warranty of **36** months from the date of successful acceptance of items and AMC/Others is .

12. You are requested to provide your offer latest by **13:30** hours on **23-Dec-2019** and the quotation will be opened on the 23th December 2019 at 14:00 PM.

13. Detailed specifications of the items are at Annexure I.

14. Training Clause (if any) **yes**

15. Testing/Installation Clause (if any) **yes**

16. Performance Security shall be applicable: **7%**

17. Information brochures/ Product catalogue, if any must be accompanied with the quotation clearly indicating the model quoted for.

18. Sealed quotation to be submitted/ delivered at the address mentioned below, **Engineering College, Bikaner,karni Industrial Area , Pugal Road, Bikaner Rajasthan**

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

10/12/19

(Authorized Signatory)
Name & Designation

Principal
Engineering College
BIKANER

re I

	Name of equipments with model	Quantity	Specifications
1	**X-Band Microwave Bench, complete setup with various components**	**01**	**Klystron Power Supply-01** Beam Supply Voltage : 240 - 420 VDC,Variable Current : 50 mA Regulation : 0.5 % for 10% I/P variation Ripple :< 5 m Vrms (ON Load) RepellerSupply : -18 V to -270 V DC Variable (ON Load) Regulation : 0.25 %, for 10 % I/P variation Filament Supply : 6.3 VDC (adjustable on rear panel) Over-Load Trip Current : 65 mA Modulation : AM (Square) FM (Saw - tooth) Frequency Range : 500 - 2000 Hz 50 - 150 Hz Amplitude : 0 - 110 Vpp 0 - 60 Vpp External : Through External Modulating Signal Digital display for : Beam voltage, Beam Current, Repeller voltage Modulation Selector : CW/AM/FM/EXT 3½ Digital Panel meter : 2 V Meter Selector : Beam Voltage (V)/ Current (I)/ (Repeller) Rep. Connectors : 5-Pin lunar Connector, BNC for External Modulation Power Supply : 230 V ±10%, 50 Hz Power consumption : 32 VA (approx.) Audio Input : Provided for audio communication **Gunn Power Supply-01** Display : 16 x 2 Characters LCD Voltage Range : 0 to 10V Current : 750mA max Stability : 0.1% for ±10% mains variation Ripple : 1.0mV typical Modulating Frequency : 800 to 1200Hz Modulating Voltage : 0 - 10Vpp variable Modulation Modes : Continuous Wave Internal Modulation (Square Wave) Audio Modulation PC Data Modulation PC Interface : RS232 Output Connector : BNC for Gunn Bias N-Type connector for Pin Bias Mains Supply : 90 - 270V ±10%, 50Hz **Gunn Oscillator-01** Fequency(GHz) 8.2-12.4 Waveguide WR-90 Flange UG-39/U Bias Voltage max. 10V Normal Power Output 10mW Output Connection BNC(F) Frequency Adjustment By Micrometer **Klystron Mount-01** Frequency(GHz) 8.2-12.4 Waveguide WR-90 Flange UG-39/U **Pin Modulator-01** Frequency(GHz) 8.2-12.4 Waveguide WR-90 Flange UG-39/U

Bias Voltage 0-12 Vpp
Output Connector TNC(F)

Isolator-02

Frequency Range 8.2-12.4
Waveguide WR-90
Flange UG-39/U
Max. VSWR 1.15
Min. Insertion Loss 0.46 dB
Min. Isolation 20 dB
Return Loss 22.4

Frequency meter-02

Frequency Range(GHz) 8.2-12.4
Waveguide WR-90
Flange UG-39/U
Calibration Accuracy ± 2%
Calibration Increment 5MHz
Max. VSWR 1.28 At 10.5GHz
Return Loss -18.2 At 10.5GHz

Variable Attenuator-02

Frequency Range(GHz) 8.2-12.4
Waveguide WR-90
Flange UG-39/U
VSWR Max. 1.25 At 10.5GHz
Av. Power 2 W
Return Loss -19.23 At 10.5GHz

Slotted Section-02

Frequency Range 8.2-12.4
Waveguide WR-90
Flange UG-39/U
Residual VSWR 1.01
Slope (dB) ± (0.2dB)

Tunable Probe-01

Frequency(GHz) 8.2-12.4
Detector IN23
Output
connector BNC(F)
Type Tunable

Matched Termination-02

Frequency(GHz) 8.2-12.4
Waveguide WR-90
Flange UG-39/U
VSWR 1.03 At 10.5GHz
Return Loss -33dB At 10.5GHz
Av. Power 2W
Type Fixed

Wave Guide Detector Mount-02

Frequency Range(GHz) 8.2-12.4
Waveguide WR-90
Flange UG-39/U
Detector IN21(any
equivalent)
Output Connector BNC (F)

E-Plane Bends-01

Frequency Range(GHz) 8.2-12.4
Waveguide WR-90
Flange UG-39/U
VSWR Max. 1.25 At 10.5GHz
Return Loss -25.7 dB At 10.5GHz

Magic Tee-01

Frequency Range 8.2-12.4

Waveguide WR-90
Flange UG-39/U
Movable Shorts-01
Frequency(GHz) 8.2-12.4
Waveguide WR-90
Flange UG-39/U
Reflection
Coefficient 0.98
Fixed Attenuators-01
Frequency Range(GHz) 8.2-12.4
Waveguide WR-90
Flange UG-39/U
VSWR Max. 1.06 At 10.5GHz
Av. Power 2W
Accuracy ± 0.5 dB
Return Loss -31 dB At 10.5GHz
Cross Directional Coupler-01
Frequency Range(GHz) 8.2-12.4
Waveguide WR-90
Flange UG-39/U
Coupling (dB) 20 dB
Directivity (Min) 25 dB
Coupling Accuracy ± 1 dB
SWR Meter-02
Display : 16 x 2 Characters LCD
Sensitivity : 0.1µV for 200Ωinput impedance
Noise Level : Less than 0.02µV
Range : 0-70 dB in 10 dB steps
Input : Unbiased low and high impedance (200Ω and 200kΩ)
Display Select
SWR : 1-9
dB : 0-10
Modes : Normal (Bar graph for signal strength) - Audio - PC-Interface
Gain Control : Adjustable, 0-10dB (approximate)
Input Connector : BNC (F)
Input Frequency : 1000Hz ±10%
Mains Supply : 90-275V, 50Hz
Cooling fan-01
BNC cable-08
Wave guide stand-08
Specification of Analysis instrument to measure the waveform
Bandwidth: 100 MHz
Analog Channels: 4
Digital Channel: 16
Real-time Sample Rate: 1 GSa/s
Analog channel: 1 GSa/s(single channel)
Digital channel: 1 GSa/s (8-channel), 500 MSa/s (16-channel)
Memory depth of Digital channel up to 24Mpts
Dynamic Range: 1mV/div to 10V/div
Time Base Scale : 5 ns/div to 50 s/div
Input Coupling :DC, AC or GND
Input Impedance :Analog channel: (1 MΩ±1%) || (15 pF±3 pF)
:Digital channel: (100 kΩ±1%) || 8 pF±3 pF)
Probe Attenuation Coefficient Analog channel: 0.01X-1000X, 1-2-5 step
Bandwidth (-3dB) : DC to 100MHz
Vertical Resolution Analog channel: 8 bits
Digital channel: 1 bit
Math Function +,-, x, /,FFT, Differential, Integration, Logarithmic, Logical should be available
Should be with advance serial bus trigger and decoding functions

			including RS232/UART, I2C and SPI Std. Probes : RP2200 150MHz BW Passive Probe:4 sets;1 set RPL1116 LA Probe Time correlation display for both analog and digital signals Support a variety of logic levels Triggering and Decoding across Analog and Digital channels connectivity: LAN(LXI),USB Host & Device, AUX Display: 7 Inch WVGA (800x480), multiple intensity levels waveform Persistence Time Min, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s, 5 s, 10 s, 20 s, Infinite
2	**S-Band Microstrip line trainer with separate variable frequency generator (S-Band), digital power meter, S-Band power amplifier(35 dB)**	**01**	Complete setup with Generator, MIC Components and Meter Gold Plated Components and Connectors Microwave Generator with internal AM and FM PC to PC Data Communication Antenna Radiation Pattern measurement Directivity and Gain measurement This Training System Includes **1. Microwave Generator (2.2 - 3GHz)** Frequency Range : 2.2 - 3GHz continuously variable Display : 16 x 2 LCD Display Accuracy : 40MHz Impedance : 50V Min RF level : 5mW Output Level Variation : 10 - 20 dB Operating Modes : Sweep, CW, Int. AM, Int. FM, Ext. AM, PC communication Modulating Frequency : 100Hz to 5kHz AM square wave, FM triangular wave Power Supply : 230V ±10%, 50Hz Power Consumption : 5VA (approximate) **2. VSWR Meter** Sensitivity : 0.1µV for 200W input impedance for full scale deflection Noise Level : Less than 0.02µV Range : 0 - 60 dB in 10 dB steps Input : Un-biased low and high impedance crystal biased crystal (200 and 200K) Meter Scale : SWR 1-4, SWR 3-10, dB 0-10, expand SWR 1-1.3, dB 0-2 Gain Control : Adjusts the reference level, variable range 0 -10 dB (approximate) Input Connector : BNC (F) Input Frequency : 1000Hz ±10% Power Supply : 230V ±10%, 50Hz / 60Hz on request Power consumption : 2VA (approximate) **3. MIC Components** 1) Test Jig It includes of the following: a) 10 dB directional coupler b) Detector c) Shorts d) Matched Loads e) Attenuator 2) Low pass Filter Cut off frequency : 2.5GHz (approximate) Dielectric material : Ceramic Substrate Dielectric constant : 3.02 3) Band Pass Filter Center frequency around:2.4GHz

Dielectric material : Ceramic Substrate
Dielectric constant : 3.02
4) Band Stop Filter
Center frequency around:2.4GHz
Dielectric material : Ceramic Substrate
Dielectric constant : 3.02
5) Branch Line Coupler
Dielectric material : Ceramic Substrate
Dielectric constant : 3.02
Coupling : 3dB
6) Rat-Race Coupler
Dielectric material : Ceramic Substrate
Dielectric constant : 3.02
Coupling : 3dB
7) Parallel Line Directional Coupler
Dielectric Material : Ceramic Substrate
Dielectric Constant : 3.02
Coupling : 15dB
8) Power Divider
Dielectric Material : Ceramic Substrate
Output Power : 3dB
Return Loss : 8dB
Dielectric Constant : 3.029)
9)Ring Resonator
The Resonance freq. : 2.4GHz
Dielectric material : Ceramic Substrate
Dielectric constant : 3.02
10) 50E Microstrip Line
Dielectric material : Ceramic Substrate
Dielectric constant : 3.02
11) RF Switch (Pin Modulator)
Frequency Range : DC to 5GHz
Rise/fall time : 6 ns typical
Type : SPDT
12) RF Mixer
Frequency Range : 2.0 to 7.0GHz
Conversion Loss : 6.2dB typical
L-R Isolation : 30 dB typical
RF Power : 50mW
13) Local Oscillator
Frequency Range : 2.2 to 3GHz
Tuning Voltage : 5V DC
Operating Voltage : 5V DC
14) Measuring line
Dielectric Material : Ceramic Substrate
Dielectric Constant : 3.02
15) Isolator
Isolation : 15dB
Impedance : 50 Ohms
Insertion loss : 0.8dB Max
AvgPower : 5W
Design Tolerance : ±5%
16) Circulator
Isolation : 15dB
Impedance : 50 Ohms
Insertion loss : 0.8dB Max
AvgPower : 5W
Port : 3
Design Tolerance : ±5%

4. Transmitting and Receiving mast

			5.Accessories Matched Loads (5 Nos.) Short Coaxial Detector Microstrip Directional Coupler (10 dB) SMA to SMA Adapters (Both male & female) SMA (male) connector fitted cables Attenuator (3 dB) +12V DC Adaptor Transmitting and Receiving Mast SMA (Male) to BNC (Female) adaptor 3-pin Lunar cable

Mayuri

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. _____