INVITATION LETTER

Package Code: TEQIP-III/2019/ntst/99 **Current Date: 10.06.2019**

Package Name: NITS/TEQIP-III/ECE/01_R **Method: Shopping Goods**

Sub: INVITATION LETTER FOR NITS/TEQIP-III/ECE/01_R

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:

S. No.	Item Name	Quantity	Place of Delivery	Installation Requirement (if any)	EMD
1	Equipment for Antenna and Microwave Engineering Laboratory	As per Annexure -I	NIT Sikkim	YES	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. **Qualification Criteria**:

   The bidder/supplier should have:

   3.1. **The bid should be accompanied with an EMD (Earnest Money Deposit) of Rs.1,50,000/- (Rupees One Lakh Fifty Thousand Only) in favour of The Director NIT Sikkim in the form of Demand Draft (DD) drawn on any commercial bank payable at Ravangla/Gangtok**.

   3.2. A minimum of 3 years experience of supplying similar items.

   3.3. An average turnover of Rs.50 Lakh in the last three years. Audited annual accounts for the last three financial year should be enclosed with the bid

   3.4. Not been blacklisted by any Govt. Institution/Organization.

4. **Quotation:**

   4.1. The contract shall be for the full quantity as described above.

   4.2. The vendors are required to quote rates for all the items given in the tender in the prescribed "**Format for Quotation Submission",** otherwise the bid shall be summarily rejected.

4.3. Corrections, if any, shall be made by crossing out, initialling, dating and re-writing.

4.4. All duties and other levies payable by the supplier under the contract shall be included in the unit Price.

4.5. Applicable taxes shall be quoted separately for all items. **The Institute has DSIR certificate (applicable GST would be 5%).**

4.6. 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.

4.7. The Prices should be quoted in Indian Rupees only.

4.8. The vendor should submit trade licence/certificate of Registration (as applicable), GST registration number with type of registration and photocopy of the certificate, the PAN of proprietor/firm/company with photocopy of the PAN card. Please attach a certificate that the quoted price is not more than that of any govt. organization/Intuition in India. This has to be mention in the offer letter clearly.

5. Each bidder shall submit only one quotation.

6. Quotation shall remain valid for a period not less than **45** days after the last date of quotation submission.

7. The quotation should include the following information:

7.1. Authorization certificate from the OEM/Principal assuring full guarantee and warrantee obligations during the liability period, for the goods offered.

7.2. The list of clients (IITs, NITs/Central Universities and other reputed Institution) duly supported by copies of purchase order.

7.3. Details of service/supports centres located in India.

8. **Evaluation of Quotations**: The Purchaser will evaluate and compare the quotations determined to be Substantially responsive i.e. which:

8.1. are properly signed; and

8.2. Confirm to the terms and conditions, and specifications.

9. The Quotations would be evaluated for all items together.

10. **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.

10.1. 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.

10.2. 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.

11. **Performance Bank Guarantee:** Performance Security has to be submitted by the successful bidder. A Bank guarantee issued by a Nationalized Bank in India towards PBG for an amount equal to 5% of total order value of purchase order and valid till the period of beyond the 2 months of completion of warrantee period should be

submitted in favour of "**The Director NIT Sikkim"**. In case, the vendor fails to provide satisfactory service, the PBG is liable to be forfeited.

12. Payment shall be made in Indian Rupees as follows:

    Satisfactory Delivery & Installation - 70% of Total Cost
    Satisfactory Acceptance - 30% of Total Cost

13. Liquidated Damages will be applied as per the below:

    Liquidated Damages Per Day Min %: 0
    Liquidated Damages Max %: 10

14. All supplied items are under warranty of **24 Months** from the date of successful acceptance of items and AMC/Others are **NA.**

15. You are required to submit your bid/offer latest by **17:30** hours on **24th June 2019.**

16. Detailed specifications of the items are at **Annexure-I**.

17. Training Clause (if any) **YES**

18. Testing/Installation Clause (if any) **YES**

19. Performance Security shall be applicable**: 5%**

20. **The quantity of the items/equipments can be increased or decreased.**

21. Information brochures/ Product catalogue with actual specification and images must be accompanied with the quotation clearly indicating the model quoted for. If the supply is found to be different or not as per specification/quality the whole bid will be consider as rejected and the EMD shall be forfeited. The NIT Sikkim shall not be responsible for any cost incurred in delivery or return of rejected goods/equipments.

22. Sealed quotation to be submitted/ delivered at the address mentioned below:

    The Nodal Office (Procurement),
    TEQIP-III,
    National Institute of Technology Sikkim,
    Barfung Block, Ravangla, South Sikkim
    Pin Code-737139.

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

Dr. Achintesh N. Biswas
Nodal Officer (Procurement)

ANNEXURE-I

SN	Item Name	Qty.	Specifications
01.	**Antenna Training Unit**	**3**	The Antenna Measurement System should have the facility to test 30 different Types of Antenna as listed and provision to conduct 3 Batches A) The Antenna Measurement with Data Acquisition System having the facility to be controlled, set parameters and acquire data from the system using software based on LABVIEW. 1. The Frequency of the RF Source should be PLL Synthesized and should generate 100MHz to 3GHz: **3No.** . 2. The System should also be able to work in the Stand alone mode using Membrane Key pad and 128x64 Graphic LCD Display with backlit and PC Control mode 3. The Controller should be designed using ARM processor. 4. The Transmitter and Motororized Receiver Stand should be made of special material which is inhert to EM frequency and should have engraved height and angle scale on it with spirit level at the base.- **3 Nos** 5. Universal plug and fix Antenna mounts should be provided to hold the all types of antenna assembly in vertical and horizontal orientation for co and cross polarization.- **3 Nos** 6. Stepper Motor provided with the system for rotation of Antenna should have minimum 2Kg torque and minimum Step Angle of 1.8 Degree and 5.4 Degree 7. The Source should have the facility to program the Frequency with a resolution of 1MHz 8. The RF Detector should be a Logarithmic Detector with Frequency range of 100MHz to 8 GHz. 9. The Radiation pattern of the Antenna under test should be plotted on the PC Screen in Cartesian and Polar Graph. 10. Horizontal and Vertical Markers to be provided for measurements like Antenna Gain, FBR , Antenna Resolution, HPBW, BWFN 11. Built in Experimental Set-up to be embedded inside the controller The same system should be able to demonstrate and measure various parameters of the Wired Antenna, Microstrip Antenna, Aperture Antenna, Array Antenna and Reflector Antenna. **List of Standard 30 Antenna Supplied with the setup** **Wire Antenna** 1. Monopole Plane base ground 2. Dipole (2nos.) 3. Folded Dipole

			4. Vee Dipole 5. Rectangular Loop 6. Helical 7. Monopole- Wire 8. YagiUda 9. 3 Lamda/2 Linear dipole 10. Log Periodic Antenna 11. Circular Loop 12. Rhombus Antenna **Microstrip Antenna** 1. Planar Dipole 2. Planar Monopole 3. CMSA 4. TMSA 5. 2X1 ARRAY 6. Annular ring 7. Chip Antenna 8. RMSA –shorting pin 9. RMSA- shorting plate 10. RMSA- Circular Polarized 11. RMSA-Dual Stub and Slot loaded 12. Insert Feet **Aperture Antenna** 1. E- Horn 2. Open ended Waveguide Rectangular **Array Antenna** 1. Broadside Array 2. Collinear Array 3. End Fire **Reflector Antenna** 1. Parabolic Reflector **List of Deliverables:** **1. Antenna Source and Detector with Stepper Motor Controller Module- 3 Nos** **2. Antenna Transmitter and Motorised Receiver Stand – 3 Sets** **3. Universal Mount , RF Cables and Accessories – 3 Sets** **4. Antenna Set consisting of 30 Antennas- 1 Set** **5. Software on CD – 1Set** **6. Manuals- 3 Sets** **7. Accessories – 1 Set**
2	**Microstrip Integrated Circuit Training System**	**2**	**MICROWAVE INTEGRATED CIRCUITS MEASUREMENT SYSTEM WITH RF GENERATOR and DETECTOR** This System should consist of Passive Component Board consisting of Filter section (LPF,HPF,BPF,BSF),Coupler section (Branch line,

			Coupled line, Rat Race), Tee and Pi Attenuator section, Circulator-Isolator, Power Divider, Ring Resonator and Transmission Line Section with Terminations and Loads. Two dedicated Active circuits Board provided with Amplifier, Mixer, VCO and PIN Diode Phase Shifter, Schottky Diode Detector, PIN Diode Modulator, PIN Diode SPST and SPDT Switch and PIN Diode Variable Attenuator. This System should be integrated with the RF Generator and Detector for Measurements **SPECIFICATIONS** **RF Generator & Generator with external Directional Coupler** Source: Frequency:100 MHz to 3 GHz, Frequency resolution:1MHz, Frequency Generation Modes: Single tone , frequency sweep, frequency hopping, Frequency sweep for :≤ 3.8 sec, full span , Power Sweep 0to 20 dB, Frequency offset:±100Hz,Power max:+3dBm,Power min:30dBm, Power variation:±0.5dB, Power resolution:0.5 dB, Power sweep mode :3.9 sec, AM Modulation Range: 100MHZ to 2.8GHz, FM Modulation Range: 300 MHz to 1 GHz, PSK Modulation Range: 100 MHz to 1 GHz, Operating mode: Single, CW, hopping , Detector: Dynamic range:-50 dBm to 10 dBm , RF Detector sensitivity:-60dB, Interface :USB-B plug, Impedance :50 ohm, Display: LCD , 128 x 64 graphic display, Key Pad: Membrane Type, Software: User friendly GUI to display the stored results and plot the same. Inbuilt Cable calibration facility to be provided and measurements facility and plotting the VSWR, Return Loss, S21 of DUT **External Directional coupler** to be provided with following specification: Wideband 500 MHz to 3 GHz ,Insertion loss = 0.5dB,Coupling = 10dB **MIC Communication System: 01 Set consisting of 3 Boards- Passive Component Board, Active Component Source Board and Active Component Detector Board.** **MMIC Amplifier** Frequency: 100 MHz to 3GHz , Gain:15 dB @ 2GHz (Typical) **VCO** Frequency : 1600 MHz – 3200MHz , Power Output : 8 dBm (typical) **Frequency Mixer** RF / LO Frequency: 1600 MHz to 3200 MHz ,LO Power : +7 dBm

			Micro strip Filters **LPF** Frequency Range : 100 MHz to 2 GHz (3dB cut-off +/- 50 MHz) **HPF** Frequency Range : 1.9 GHz (3dB cut-off +/- 50 MHz) **BPF** Center Frequency : 2 GHz (+/- 50 MHz), Bandwidth : ~ 300 MHz @ 3 dB **BSF** Center Frequency :1.8 GHz (+/- 50 MHz), Bandwidth : ~ 850 MHz @ 3 dB **Attenuators** Tee Attenuator: 10 dB & Pi Attenuator : 5 dB **Couplers : Coupled Line Directional Coupler** Center Frequency : 2 GHz (+ /- 50 MHz) Coupling : 13 dB **Branchline Coupler** Center Frequency : 2.45 GHz (+/- 50 MHz) **Rat Race Coupler** Center Frequency : 2.45 GHz (+/- 50 MHz) **Ring Resonator** Center Frequency : 2.45 GHz (+/- 50 MHz) **Power Divider** Frequency : 500 MHz to 3 GHz **Transmission Line Terminations / Loads:** OPEN Termination, SHORT Termination, MATCHED Load, MISMATCHED Load **Pin Diode Switch** SPST Switch Frequency : 1GHz to 2.5 GHz SPDT Switch Frequency : 1GHz to 2.5 GHz **Pin Diode Variable Attenuator:** Frequency :1.5 GHz to 2.5 GHz, Attenuation range: 7 dB to 17 dB **Schottky Diode Detector** Frequency: 2.4 GHz
3	**Doppler Radar Trainer: 2 no. and Radar Simulation Software (10 users)**	**1**	The Radar Training System should consist of 2 Modules. The First Module should cover the concept of Pulsed Radar using the Simulation Software and the Second Module should cover the concept of Doppler Radar supplied along with the Hardware. The Pulsed Radar Simulation Software should be supplied with **10 User Site License** that should be installed in our PC which should be node-locked and perpetual.The Simulation Software should be designed to introduce the fundamentals of PULSE RADAR technology with emphasis on design environments concepts. The design frequency range should be up to 30 GHz and should have a PPI Screen and Sector PPI Screen as Display. The radar software should consist of

			1. Antenna section (cut parabolic, parabolic) with facility to calculate the Gain and Beam Factor. 2. Transmitter section should have facility to change the Radar Frequency, Pulse width, PRF and Peak Power. Calculation of the Range resolution and Pulse energy should be possible. 3. Receiver section should have the facility to change the Rx Noise Figure, BW , SNR and the Scan Rate. Calculation of Hits per Scan, Gain and Max. Range should be possible. 4. Radar environment: Software should have the facility to simulate various Radar Environment like Jammer,Clutters like Surface , Volume and Rain,Losses like RF Link Loss, Matched Filter Loss and CFAR Loss, RCS- should have libraries of various objects like Aeroplane, Ship, man, bicycle etc The Software should have dedicated animations windows for target detection, slant range, stealth aircraft, and effect of clutters.. **SIMULATION SOFTWARE PARAMETERS** Frequency : 50MHz ~ 30GHz Pulse width : 0.1us ~ 100us PRF : 1KHz ~ 1MHz Display formats : PPI Number of ranges : Four variable Maximum range : Dynamic Display options : Range markers Receiver noise factor : 1 ~ 50 Receiver temperature : 150 ~ 400 Kelvin Peak power : 1mW ~ 1MW (-30 ~ +60dBW) Antenna type : Parabola, Cut Parabolic Antenna dimensions : 0.5m ~ 60m Scan width : 1 ~ 120 degrees in azimuth Scan type : Electronic Scan speed : 100 rpm Plumbing loss : User defined Switch loss : User defined RCS (m2) : 0.0001 ~ 100 Noise jammer / repeater : CW noise Noise Effective : 1m W ~ 1KW

			radiated power Bandwidth : 10KHz ~ 2GHz Bearing : -60 ~ +60 degrees in Azimuth The 2nd Module should be a Doppler Radar with 16bit radar data acquisition System with PC connectivity via USB. Should have the facility to Display and log dopplersignals, Signal views in frequency and time domain, to view signal on test points on front plate as well as in software windows **HARDWARE SPECIFICATION:** **Microwave Transceiver** Type : Integrated transmitter and receiver with dual 4 patch antenna Operating frequency : 24GHz (K-Band) Single balanced mixer : 50MHz bandwidth EIRP output power : 15dBm Beam aperture : 80^0 /34^0 **Software** Graphically configurable frequency and peak detection Time domain display(scope) with trigger and filter functions Real time capture and display of signal at background along with current acquired signal Speed display : Display in km/Hr, m/s, KHz Volts/div : 20mV/div ~ 3V/div Display : Peak to peak level display Time Base : 0.5mS/div ~ 10ms/div(real time) Trigger : Manual Storage mode : Streaming to standard save files FFT : Real time with cursor measurement FFT Power spectrum display from 5Hz ~ 20 Khz
4	**Advanced Transmission Line Trainer**	**3**	Motorized transmission Line Trainer should have facility for Minima and Maxima Measurement for various load condition as well as various frequencies. Probe / Sensing motion along the transmission line having standard hardening Ball screw arrangement. Software/Panel mode operation. SPECIFICATIONS Frequency

			300MHz ~ 1500MHz Source type • PLL Synthesizer Power +9dbm Resolution 150KHz Characteristics impedance • 50 ohm Power handling capacity +30dBm Detector type Dual Log type Output array storage 580 points on self memory Operational Mode PC & Panel mode (Controlling / Driving / Data plotting) Length of transmission line 60CM. Motorized Sensing probe resolution 1mm/5mm/10mm Probe output dbm/dbuV/mV Experimental Mode Standing wave insertion loss(S21) ,Return loss (S11), Pulse mode ,Directional coupler Software Compatible to Windows 98, Windows 7 & Windows vista Graphs Incident voltage , Reflected voltage, Standing wave, Smith chart , Graph comparison facility Load OPEN, SHORT, MATCH, MISMATCH Connector SMA female, (Jack)
5	**Co-axial Transmission Line Trainer with Function Generator and Digital Storage Oscilloscope (100 MHz)**	**3**	**Transmission line** • Coaxial Cable 100m (25m x 4) **Impedance matching** • 0 W ~ 100 W variable load (quantity 2), 1Ω fixed load **Interconnections** • 2mm socket on all input / output connections 2 MHz Function Generator and 100MHz Digital Storage Oscilloscope to be provided along with the system

FORMAT FOR QUOTATION SUBMISSION

(In letterhead of the supplier with seal)

Date: .....

To,

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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.: .....