



**National Institute of Technology Sikkim,
Barfung Block, Ravangla, South Sikkim Pin Code-737139**

INVITATION LETTER

Package Code: TEQIP-III/2019/ntst/91

Current Date: 09-Apr-2019

Package Name: NITS/TEQIP-III/ECE/03

Method: Shopping Goods

Sub: INVITATION LETTER FOR NITS/TEQIP-III/ECE/03

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	Equipment for wireless communication laboratory	1	NIT Sikkim	Required

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 **45** 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 - 10% of total cost**
Satisfactory Acceptance - 90% of total cost
10. Liquidated Damages will be applied as per the below:
Liquidated Damages Per Day Min % : 0
Liquidated Damages Max % : 10
11. All supplied items are under warranty of 24 months from the date of successful acceptance of items and AMC/Others is NA.
12. You are requested to provide your offer latest by 17:30 hours on 13-May-2019.
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: 0%
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,
National Institute of Technology Sikkim, Barfung Block, Ravangla, South Sikkim Pin Code-737139
19. We look forward to receiving your quotation and thank you for your interest in this project.



Dr. Achintesh N Biswas

Nodal Officer (Procurement)

TEQIP-III

National Institute of Technology Sikkim



Annexure I

SNo	Item	Technical Specifications
1	Mobile Hand Set Trainer	<p>GSM Mobile Handset Trainer should have a Quad Band 850/900/1800/1900 MHz GSM/GPRS modem.</p> <p>It GSM Module should be interfaced with ARM processor: LPC2148</p> <p>It should also have facility to interface Modem with GUI and ARM processor.</p> <p>It should consist of:</p> <ul style="list-style-type: none"> • 20X4 LCD display • 6X3 multifunctional membrane keyboard. • 6 Pin SIM card holders. • Piezoelectric buzzer for incoming calls indication. • Vibration motor used to create vibration. • 3.5mm microphone and speaker jack • 5V DC power supply. • Provision for manual reset. <p>It should provide variable voltage source for ADC input, 9 test points for supply and signal observation and User friendly GUI for study of AT commands.</p> <p>It should support:</p> <ul style="list-style-type: none"> • Home Automation demo like light on / off (using LEDs) • Relay on / off • ADC value indication by SMS <p>On Board peripherals:</p> <ul style="list-style-type: none"> • RELAY: <ul style="list-style-type: none"> ▪ 5V SPDT Mechanical Relay (2nos) ▪ NO & NC LED Indicator • VIBRATOR: 3V operating voltage • SWITCH AND LED: <ul style="list-style-type: none"> ▪ 2 Push to on Switch for Automation ▪ 2 Push to on Switch for Manual reset, turning on / off the modem ▪ 2 LED to indicate the status of modem
2	Mobile base Station Development System	<p>This System should be designed to explain, teach and experiment Real time Mobile Communication system in the laboratory with Mobile Tower and End users – Mobile phones</p> <p>Should demonstrate the function of BTS which facilitates wireless communication between GSM cellular phones</p> <p>This Base station should cover all bands i.e. 900MHz, 1800MHz, 2G Various parameters of the Base Station like MCC, MNC , ARFCN, GSM mode, LAC, CI should be configurable</p> <p>Provision to establish a Call, Sending SMS and monitoring the Network.</p> <p>Concept of Hand-off between 2 base stations.</p> <p>GSM Signal Monitoring system to measure the RSSI, and Find Cell Information like CID, RNC, LAC</p> <p>Facility to Measure the Link Quality like SNR, Transmitter Power , Receiver Level etc.</p> <p>Hardware Specification for the Base Station Transceiver – 1 No</p> <p>RF Coverage from 70 MHz to 6 GHz RF</p> <p>GNU Radio and open BTS support through the open-source USRP Hardware Driver</p> <p>USB 3.0 High speed interface (Compatible with USB 2.0)</p>



		<p>Flexible rate 12 bit ADC/DAC 1TX, 1 RX, Half or Full Duplex Xilinx Spartan 6 XC6SLX75 FPGA Up to 56 MHz of real-time bandwidth Power: DC Input : 6V Log periodic Antennas frequency Band 850MHz to 6 Ghz: 2nos Smart Mobile Phones – 2 Nos Host Controllers with Open Source Software to interface with the Base Station Transceiver Hardware and should be independent of any Proprietary Software – 1 Nos.</p>
3	Global Position System Technology Trainer	<p>GPS Technology Trainer should have the facility to configure Receiver board with following specifications:</p> <ul style="list-style-type: none"> • 1.575 GHz Frequency • 12 Channels • On-board clock and system processor • Receiver sensitivity of -165dBW minimum • 1 second Update rate • 15 seconds warm acquisition time <p>It should also provide Position accuracy:</p> <ul style="list-style-type: none"> • Non-differential GPS : 15 meters RMS (100 meters with selective availability on) • Velocity accuracy : 0.2 m/s RMS steady state • One-pulse-per-second : ± 1 microsecond at rising edge accuracy of PPS pulse <p>Software interface:</p> <ul style="list-style-type: none"> • Dual channel CMOS / TTL level with user selectable baud rate (300, 600, 1200, 2400, 4800), NMEA0183 Version 2.0 <p>ASCII output:</p> <ul style="list-style-type: none"> • (GPALM, GPGGA, GPGSA, GPGSV, GPRMC, GPVTG, PGRME, PGRMT, PGRMV, PGRMF, LCGLL, LCVTG) <p>It should be capable to process inputs:</p> <ul style="list-style-type: none"> • Initial position, date and time (not required)- Earth datum and differential mode-configuration command, almanac <p>It should provide precise Outputs:</p> <ul style="list-style-type: none"> • Position, velocity and time <ul style="list-style-type: none"> ▪ Receiver and satellite status ▪ Geometry and error estimates • Binary TTL output data format, Binary format phase data • LED and beeper indication for self check cycle • LED indication for active RS-232 interface
4	Bluetooth Technology Trainer	<p>The Bluetooth trainer should have a Bluetooth module with integrated Bluetooth core and radio/antenna circuit. It should also have facility to establish communication between Bluetooth Modems and Phone. Each Set should consist of 2 Units of Bluetooth Module with Bluetooth integrated core so that we can show communication between to devices.</p> <p>Specifications: Trainer should have facility to configure the Bluetooth module with Integrated 2.4GHz, IEEE 802.15 transceiver:</p> <ul style="list-style-type: none"> • Frequency Range : 2402MHz – 2480MHz, Transmit Power: +18dBm <p>On-board peripherals: 2 AIO (Analog Input), On Board Temperature Sensor &</p>

		<p>Variable Voltage Source for ADC., 5 DIO (Digital input),On board Relay, LED & Switch output</p> <p>Relay: SPDT Mechanical Relay, Screw Terminal Block Connector for external device</p> <p>Buzzer, ADC Interface: 10K potentiometer, LDR: Light Resistance at 10 Lux 25°C: Temperature Sensor: Switch & LED:</p>
5	Zigbee Technology Trainer	<p>The Zigbee trainer should be designed to study the ZigBEE wireless technology and IEEE 802.15.4 standard. Each Set should consist of 2 Units of ZigBee Module so that we can show communication between to devices.</p> <p>SPECIFICATIONS</p> <p>On board peripherals: Relay: SPDT Mechanical Relay, Screw Terminal Block Connector for external device , Duzzer: Tone Type. Single , ADC Interface: 10K potentiometer</p> <p>LDR: Light Resistance at 10 Lux 25°C . Temperature Sensor: Temperature range: 0°C - 120°C</p> <p>Switch & LED: Six SMD LEDs (Power, Status & User Interface) ,Two SMD Switch (Reset & Factory Reset) ,Four Toggle Switches (Power & User (3))</p> <p>Software: Trainer should have facility to interface PC with GUI application and AT Commands. GUI should have facility to configure several setting of local node and remote</p>
6	GPRS Technology Trainer	<p>The GPRS Module should be fixed on the Mother Board with a miniature module featuring GPRS quad band (850/900/1800/1900MHz) connectivity and several interfaces to the 'real world'. This module should integrate a powerful 16 bit processor which should run custom applications and a GPRS transceiver which handles the connectivity.</p> <p>This Trainer should provide the embedded world with a powerful 'mobile internot network engine', communicate between the microcontroller and the GPRS transceiver sending all the required AT commands, parsing responses and managing asynchronous messages using the API.</p> <p>Specifications:</p> <ul style="list-style-type: none"> ▪ 16 Bit Proccssor PIC24FJ256GB206 or equivalent • Digital I/O up to 32 re-mappable at Runtime ▪ Analog in 10 channels: 10bits ADC, Voltage ref on-board: 2,048V • Antenna: uFL connector for external antenna • Power Supply : 3.3 V • USB : On The Go (OTG) • Communication: up to 3 UARTs, SPI, 2 I2C • Flash : 16 Mbit : EEprom : 64 Kbit <p>On board Interfaces: Micro USB connector for firmware download and serial debug using our IDE , Micro SD connector , RJ45 connector , SIM card connector, USB Host connector</p>
7	WiFi Technology Trainer	<p>The Wi-Fi Trainer Kit should be fixed on the Mother Board is a miniature web server module featuring a fully integrated 802.11g Wi-Fi interface and several interfaces to the 'real world'.</p> <p>This module should integrate a powerful 16 bit processor which runs custom applications and a Wi-Fi certified transceiver which handles the connectivity.</p> <p>This Trainer should provide the embedded world with a powerful 'Internet engine' to a browser-based interface over the Internet.</p> <p>Real time data should be both displayed and/or updated from a standard web browser, even on smart phone or tablets, as the module should support dynamic web pages.</p> <ul style="list-style-type: none"> • 16 Bit Processor PIC24FJ256GB206 or equivalent • USB : On The Go (OTG) • Transceive: MRF24WG0MA/MB 802.11g Wi-Fi certified

		<ul style="list-style-type: none"> • Antenna: PCB antenna • Analog In :10 channels - 10bits ADC - Voltage ref on board 2,048V • Communication: up to 4 UARTs, SPI, I2C • Flash : 16 Mbit , EEPROM: 64 Kbit • API based software development <p>On board Interfaces: Micro USB connector for firmware download and serial debug using our IDE , Micro SD connector , RJ45 connector , SIM card connector, USB Host connector</p>
8	Satellite Communication Trainer	<p>This Trainer should have the capability to establish a Satellite Communication Link for Audio, Video and Data Transmission. This system should have all features programmable through ARM 7 processor- ARM - 32-bit RISC LPC2148 processor or (equivalent) based PLL synthesized microwave operation (ISM license free band</p> <p>Should have programmable membrane keypad and Display to set the experimental parameters.(20 X 4 LCD digital display and 16 keys keyboard).</p> <p>This System should consist of</p> <p>Satellite Transmitter PLL Synthesized 2.4 GHz, Satellite Receiver PLL Synthesized 2.4 GHz, Satellite Emulator. 2.4 GHz</p> <p>Frequency: 2.4GHz, 2.427GHz, 2.454GHz, 2.481GHz</p> <p>Communicates audio, video, digital data, tone, voice and function generator signals</p> <p>Detachable pair of Telescopic Antennas should be provided.</p> <p>Should demonstrate audio path delay using digitally buffered technique</p> <p>FM / FDM Modulation should be used to transmit two audio and one video channel simultaneously</p> <p>Quality aluminum cabinets and tin cans for shielding should be provided</p> <p>Low RF leakage and isolation of 100dB</p> <p>Teflon cables for carrying RF signal</p> <p>Emulation of Signal Fading, Thermal Noise, Propagation delay and path Loss</p> <p>C/N and S/N measurement facility</p> <p>Facility to attach analog /digital communication kits.</p> <p>To measure the signal parameters in an analog FM/FDM TV satellite Link</p> <p>Multimedia based interactive e-manual</p>



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. _____