

Tender No. CCET/DG/SPA/2017/ \_\_\_\_\_

Dated:- \_\_\_\_\_



**CHANDIGARH COLLEGE OF ENGINEERING & TECHNOLOGY (DEGREE WING), SECTOR 26, CHANDIGARH**  
(FAX No. 0172-2750872, Phone No. 0172-2750943)  
**E-TENDER NOTICE**  
**College website: - www.ccet.ac.in**

Chandigarh College of Engineering & Technology (Degree Wing), Sector-26, Chandigarh invites e-tenders for the purchase of equipments in the Labs of Electronics and Communication Engineering Department on turnkey basis for each scheme. The dates for opening and closing of e-tender are as given below:-

Start Date and Time of uploading of e-tender	End Date and Time of uploading of e-tender	Date and Time of opening of Online Bid (Technical Bid)	Earnest Money
10.2.2017 at 9.00 AM	2.3.2017 at 3.00 PM	2.3.2017 at 3.30 PM	Detail of Earnest Money to be deposited is available in the e-tender document.

**Detailed Terms and Conditions including detail of Earnest Money are available in e-tender document.**

The bid document can be downloaded from the website of Chandigarh Administration <http://www.etenders.chd.nic.in> however for general information, guidance and reference; the tenderer can approach to office of Principal, Chandigarh College of Engineering & Technology, (Degree Wing), Sector-26, Chandigarh ( Phone No. 0172-2750943 )

**Principal**



**CHANDIGARH COLLEGE OF ENGINEERING & TECHNOLOGY,(DEGREE WING),  
SECTOR 26, CHANDIGARH  
(Phone No. 0172-2750943)  
E-TENDER NOTICE  
College website: - [www.ccet.ac.in](http://www.ccet.ac.in)**

Chandigarh College of Engineering & Technology (Degree Wing), Sector-26, Chandigarh invites tenders through e-tendering the purchase of equipments in the Labs of Electronics and Communication Engineering Department on turnkey basis for each scheme :-

<b>ELECTRONICS AND COMMUNICATION ENGINEERING DEPARTMENT</b>			
<b>Scheme Name</b>	<b>Item No.</b>	<b>Item</b>	<b>Earnest Money (In Rs.)</b>
<b>SCHEME -I WIRELESS COMMUNICATION SYSTEM LAB</b>	1.	G.S.M. Trainer Kit	<b>Rs. 83,650/-</b>
	2.	Mobile Phone Trainer Kit	
	3.	CDMA-DSS (Communication system with BER measurement and with 32 channel PC based logic analyzer	
	4.	GPS Trainer	
	5.	D.T.M.F. Telephone Trainer	
	6.	GSM Application Development Board	
	7.	Wi-Fi (IEEE 802.11b) Application	
	8.	Bluetooth Development Board	
	9.	Data Formatting and Carrier Mod/Transmitter Trainer	
	10.	Data Reformatting and Carrier Demodulation Receiver Trainer	
	11.	Differential Pulse code Mod./Demodulation Trainer	
	12.	Mobile Phone Trainer (3G training platform)	
	13.	RFID Technology Trainer	
	14.	Sampling & reconstruction Trainer	
	15.	TDM Pulse Amplitude Modulation/Demodulation Trainer	
	16.	TDM Pulse Code Demodulation Receiver Trainer	
<b>SCHEME-II MICROWAVE ENGINEERING LAB</b>	1.	Klystron test bench with following equipments (Klystron	<b>Rs.33,750/-</b>
	2.	Gunn Oscillator Microwave Test Bench containing following equipments	
<b>SCHEME-III MICROCONTROLLER AND INTERFACING LAB</b>	1.	Keil kits or ESA MCB 51-2 Evaluation Board	<b>Rs. 21,790/-</b>
	2.	PIC kits	

Start Date and Time of uploading of e-tender : 10.2.2017 at 9.00 AM

End Date and Time of uploading of e-tender : 2.3.2017 at 3.00 PM

Date and Time of opening of Online Bid (Technical Bid) : 2.3.2017 at 3.30 PM

Detailed Terms and Conditions are available in e-tender document.

**NOTE:-**

*Note 1:-The tender will be on turnkey basis for each scheme.*

*Note 2:-The sealed envelope of EMD should bear the Advertisement No., Scheme No. and should be clearly superscribed as "EMD the purchase of equipments in the Labs of Electronics and Communication Engineering Department due on 2.3.2017 at 3:00 P.M.*

*NOTE 3. The bidder may note that no column of the BOQ shall be left blank. In case of items for which no bid is being made by the bidder, numeric value 0 (zero) shall be invariably mentioned for the validation of the BOQ.*

The bid document can be downloaded from the website of Chandigarh Administration <http://www.etenders.chd.nic.in> . However for general information, guidance and reference, the tenderer can approach to office of Principal, Chd. College of Engg. & Tech. (Degree Wing), Sector-26, Chandigarh ( Phone No. 0172-2750943 )

**Principal**

### **INSTRUCTIONS TO BIDDERS REGARDING E-TENDERING PROCESS**

- a. Tenders without Digital Signatures will not be accepted by the electronic tendering system. No tender will be accepted in physical form and in case it has been submitted in physical it shall be rejected.
- b. Before submission of on line bids, bidders must ensure that scanned copies of all the necessary documents have been uploaded with the bid.
- c. Principal, Chandigarh College of Engg. & Technology (Degree Wing), Chandigarh will not be responsible for any delay in online submission of bids due to any reason whatsoever.
- d. Bidders should get ready with the scanned copies of EMD as specified in the tender documents. The original instruments in respect of EMD in the shape of FDR or Deposit at Call or Term Deposit Receipt or Demand Draft in favour of the Principal, Chd. College of Engg. & Tech. (Degree Wing), Sector-26, Chandigarh should reach on or before **2.3.2017 at 3.00 PM.**
- e. The details of EMD specified in the tender document should be same as submitted online (scanned copies). Otherwise tender will be rejected summarily.

**TERMS AND CONDITIONS OF THE TENDER**

**CCET STANDS FOR CHANDIGARH COLLEGE OF ENGINEERING & TECHNOLOGY,**

**(DEGREE WING), CHANDIGARH.**

1. The last date and time for receipt of tenders is **2.3.2017** at **3.00 PM** through e-tendering only.
2. **The Tender will be two Bid Systems i.e. Technical Bid and Financial Bid on Turnkey basis for each scheme.**
  - i) **The Technical Bid will contain technical specifications; and**
  - ii) **The Financial Bid will contain rate per equipment/Item but will be considered on Turnkey basis for each scheme.**
    - a) **If rates are quoted along with Technical Bid, it will be rejected straightway.**
    - b) **The Financial Bid(s) of only those firms will be opened who are technically qualified and the date and time for opening of financial bid(s) will be conveyed after opening of the Technical Bid.**
3. Each tender must be accompanied with Earnest Money Deposit for each scheme as mentioned above in the shape of FDR or Deposit at Call or Term Deposit Receipt or Demand Draft in favour of the Principal, Chandigarh College of Engineering & Technology (Degree Wing), Chandigarh, valid for three months payable at Chandigarh on any Scheduled Bank.
4. The sealed envelope of EMD should bear the Advertisement No., Scheme No. and should be clearly **super scribed** as **“EMD for the purchase of equipments in the Labs of Electronics and Communication Engineering Department, due on 2.3.2017 at 3.00 p.m. should be separately submitted in the office of Principal, Chandigarh College of Engineering & Technology (Degree Wing), Sector-26, Chandigarh on or before 2.3.2017 upto 3.00 p.m.**
5. Any attempt direct or indirect, to cast influence, negotiation on the part of the tenderer with the officials/authority to whom he will submit the tender or the tender accepting official/authority before the finalisation of tenders will render the tenderer liable for exclusion from consideration.
6. Tender(s) received without earnest money as specified at Sr. No. 3 above shall be rejected straightway.
7. Earnest Money deposited with the Chandigarh College of Engg. & Technology, (Degree Wing), Chandigarh in connection with any other tender will not be considered against this tender.
8. The Public Sector undertaking of the Central / State Govt. are exempted from furnishing Earnest Money Deposit.
9. This tender is not transferable.
10. The tender i.e. Pre-qualifying-cum-Technical Bid shall be opened **on 2.3.2017 at 3.30 p.m.** at Chandigarh College of Engineering & Technology (Degree Wing), Chandigarh.
11. Conditional offer shall be rejected.
12. The requirements of the Institute in terms of category of equipments/items/instruments, detailed specifications and quantity are given in **SCHEDULE OF TECHNICAL SPECIFICATION/ REQUIREMENT (AS PER ANNEXURE-I)** for Civil Engineering Department. Principal, CCET reserves the right to change the quantity for any/all items without assigning any reason.
13. The tenders not accompanied by Earnest Money or incomplete in any respect will be rejected out rightly.
14. **No advance payment will be made.** Payment will be made after receipt of equipments, its inspection, installation and testing to the satisfaction of the Technical and Technical Purchase Committees.
15. The quoted prices must be mentioned showing Excise Duty and VAT / Sales tax separately.
16. The Principal, CCET reserves all rights to accept or reject any tender without assigning any reason.
17. **Rates should be quoted F.O.R. Chandigarh College of Engg. & Technology, Sector-26, (Degree Wing) Chandigarh including packaging, forwarding, postage and freight etc.**
18. The Principal, CCET reserves all rights to reject the goods if the same are not found in accordance with the required description / specifications.
19. In case of violation of any term and condition as mentioned, Earnest Money Deposit of the tenderer shall be forfeited in full or part at the entire discretion of the Principal, Chandigarh College of Engg. & Technology, Chandigarh.

20. Training for the operation of equipments, if any, shall be provided by the firm free of cost to the faculty / other staff of the college.
21. The defective equipments/items/ from the Store of Chandigarh College of Engg. & Technology, Chandigarh will be lifted at the entire cost & risk of the firm. Chandigarh College of Engg. & Technology, Chandigarh will not bear any expenses on this account and the instruments lying in the CCET premises will be at tenderer's risk and cost.
22. The equipments/items will be maintained free of charges during the warranty period.
23. **PERFORMANCE SECURITY:-** Performance security @10% of the value of supply order covering the warranty period shall be furnished by the firm in the shape of Bank Guarantee duly pledged in favour of Principal, Chandigarh College of Engg. & Technology, Chandigarh before / along with supply of equipments. **The performance security should remain valid for a period of 60 days beyond the date of completion of all contractual obligations of the supplier including warranty obligations.**
24. The CCET would return the Earnest Money Deposit to the successful tendering firm on the submission of the Bank Guarantee. EMD of unsuccessful tenderer will also be returned.
25. Rates quoted in Indian Currency only shall be accepted irrespective of foreign make of equipments/items which should include all kinds of charges, taxes, duties etc. Financial bids showing the rates in other currency shall not be considered and deemed to be rejected automatically.
26. **PERIOD FOR WHICH THE OFFER WILL REMAIN OPEN:-**  
The tendering firms should keep their offers valid for acceptance up to **31-03-2017**. If the firms are unable to keep their offers open for the above said period, they should specifically state the period for which their offers would remain open but such a provision may result in the rejection of their offers.
27. Any conditional tender or any deviation from the terms and conditions of the tender document shall render the tender liable to rejection.
28. The equipments/items will be installed free of charge by the firm / agent at the designated premises. The cost of material required for installation shall be borne by firm. Material for experimental set up such as Table, Stand etc. should be provided by the firm at its own cost. CCET will not provide any material required for installation. Foundations of equipments wherever necessary shall be provided/constructed by the supplier free of cost.
29. **DELIVERY PERIOD:-** The Delivery period of the equipment/items shall be strictly 5-7 weeks from the date of supply order. The delivery period will be extended at the sole discretion of the Principal, CCET in special circumstances on written request from the firm. Penalty @ 1.00% per week of the cost / price of equipment/items for actual period of delay after the due date of supply of equipments/items will be charged.
30. Installation and demonstration will be done by the supplier to the satisfaction of Head of Department concerned.
31. Warranty period, where applicable, should be clearly specified but not less than 1-year in any case.
32. After the receipt of equipments/items, any fault or deficiency in the equipments/items noticed should be rectified by the supplier within two weeks after intimation free of cost.
33. Instructional materials and **e-manuals** will be uploaded by the supplier free of cost.
34. The technical brochure for the equipments shall be uploaded along with Pre-qualifying – cum – Technical Bid.
35. **INSPECTION OF MACHINERY/EQUIPMENT/ITEMS/INSTRUMENTS**  
The equipments/items will be inspected only at CCET premises. However, the inspection of equipments/items at factory site or any other place, if any, shall be carried out at the risk and cost of the Tenderer / Bidder. The CCET will not bear any expenses on this account.
36. In the cases of failure or default in the performance or responsibilities or breach of terms and conditions of DNIT or MOU or any agreement of contract between the company / firm / agency / person or any legal entity and CCET, as the case may be, the said company / firm / agency / person or any legal entity shall be black listed in the light of notification issued by Chandigarh Administration vide their letter No. 1927-F&PO(3)-2009/1170 dated 27-02-2009 or any other instructions issued from time to time.

37. **The tenderer has to submit latest affidavit (as per Annexure II) regarding non black listing of individual / firm/ company, as the case may be.**

38. **JURISDICTION**

The courts of Chandigarh alone will have the jurisdiction to try any matter, dispute or reference between the parties arising out of this purchase. It is specifically agreed that no Court outside and other than Chandigarh Court shall have jurisdiction in the matter.

39. **Force majeure:-** Any failure or omission or commission to carry out provision of this tender by tenderer shall not give rise to any claim by one party against the other if such failure or omission or commission arise from an Act of God; which shall include all Acts of natural calamities such as fire, flood, earthquake, hurricane, or any pestilence or from civil strikes, compliance with any status and / or regulation of the Government, look outs and strikes, riots, curfew, embargoes or from any political or other reason beyond the parties control including war (whether declared or not), civil war or stage of insurrection, provided that notice of the occurrence of any event by either party to the other shall be given within two week from the date of occurrence of such any event which could be attributed to force majeure conditions.

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**NOTE 2.** *The bidder may note that no column of the BOQ shall be left blank. In case of items for which no bid is being made by the bidder, numeric value 0 (zero) shall be invariably mentioned for the validation of the BOQ.*

**Annexure-I**

**Schedule of Technical Specification/Requirement**

**(SPECIFICATIONS AND ALLIED TECHNICAL DETAILS OF EQUIPMENTS/ITEMS AND SCHEDULE OF REQUIREMENT)**

**Electronics and Communication Engineering Deptt.**

**(SCHEME NO..\_\_\_\_\_)**

***Note 1:- The tender will be on Turnkey basis for each Scheme.***

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**ELECTRONICS AND COMMUNICATION ENGINEERING DEPARTMENT**  
**SCHEME I to SCHEME III**

<b>SCHEME-I (WIRELESS COMMUNICATION SYSTEM LAB)</b>				
<b>Item No.</b>	<b>Name of Item</b>	<b>Specifications</b>	<b>Qty.</b>	<b>Approx. Cost (Amount in Rs.)</b>
1	G.S.M. Trainer Kit	GSM capability : GSM 900 / 1800/850/1900 E – GSM, USB Connector for programming, RS232 Communications, Microcontroller interfacing, LCD display, 8 digital I/Ps from DIP switches. 8 digital O/Ps available on LEDs. matrix keypad with connector output, ADC and DAC with amplifier & banana jack to connect CRO provision, On board power supply section, Processing Unit with programming facility & extra I/Os for extension, relay for automation, SIM application toolkit, Supports AT commands. <b>Included Accessories :</b> Serial Cable with Hands Free Kit, Antenna with Coaxial Cable Software: Should be supplied with simulation & teaching software based on wireless technology, Wall chart/poster explaining GSM fundamentals should be supplied along with trainer.	<b>02</b>	
2	Mobile Phone Trainer Kit	Real time Dual SIM mobile operation ; color TFT ; Facility to study all sections of Dual SIM mobile; Facility to measure transmitted & received frequency & identification & Verification of Band ; Study of GMSK Signals; User Interface control signals; Study of Battery & Charging circuit operation ; Test points for Voltage & waveform observation ; Facility to introduce Switched faults. Cellular system : EGSM/GSM 900; DCS1800 (2G-Dual Band) Channel spacing : 200 KHz ; Sound : Speaker and Earphone Jack (3.5mm). On board sections : Keypad, Dual SIM, Charging Circuit, User interface: Mic, Speaker, Hands free port and display LEDs Software: Independent Software to Identify different parts/Blocks of mobile. & user interface software to study call progress should be provide with above trainer. <b>Included Accessories:</b> Power Supply, Patch cord, Hands free kit, Mains cord, Battery, Wall chart/poster explaining GSM fundamentals should be supplied along with trainer.	<b>02</b>	
3	CDMA-DSS Communication system with BER measurement and with 32 channel PC based logic analyzer	Complete CDMA-Direct Sequence Spread-Spectrum (DSSS) system, Customized real-time software Analysis in Digital time, Analog time, and Frequency domain, Separate CDMA-DSSS Modulator and Demodulator , test points, On-board BNC connector for signal analysis, Software based variable Chip rate, Supports different types of Spreading codes, Facility for User to design his code, Time and Frequency domain analysis using different modulation schemes, Built-in Digital Data Generator, Built-in noise generator for analysis of noise gain effect on the Signal, Measurement of BER, <b>Included Accessories:</b> Power Supply, Patch cord, USB cable, BNC to BNC, Power cord,: 2 nos, Logic analyser : 32 channel PC based logic analyser	<b>02</b>	
4	GPS Trainer	Multi- channel GPS & carrier, Supports NMEA data protocol. GPS Software for analysis, Supports serial communication, Searching facility of satellites. USB Powered, USB for PC Communication.	<b>02</b>	
5	D.T.M.F. Telephone Trainer	Handset connection Port, Matrix Key Board, DTMF (Tone) and pulse dialing, Indication : Line On/Pulse Dialing Indication Tone, Dialing Indication Control, Test Points, Supports to understand the working of Telephone switch faults, <b>Included Accessories :</b> Telephone Handset, Mains Cord & Patch cords	<b>02</b>	



6	GSM Application Development Board	It should help in understanding working fundamentals of GSM by camping to the real service provider network. It also demonstrates the application controlling appliances through SMS using AT commands. Should be compatible with GSM trainer kit. <b>Included Accessories:</b> Serial to Parallel Cable, Bulb 230VAC to 110VAC, Patch cords	02	
7	Wi-Fi (IEEE 802.11b) Application	PC to PC communication with IEEE 802.3 ; Peer to Peer network ,Client – Server network Supports designing of Star topology, Bus topology, Ring topology, Socket Programming exercise for LINUX, Supports WEP Encryption & Decryption, Supports TCP/IP model, Color coded real time graphical representation of entire transmission & reception, Graphical Analysis of LAN performance with various parameters and protocols, Star, Bus & Ring selection ;Protocols: CSMA/CD, CSMA/CA, Stop N Wait, Go back to N, Selective repeat, Sliding Window, Token Bus, Token Ring, Error generation: Acknowledgment lost, bad packet, auto error generation Graphical Representation: Real time Graphic representation of data on s/w screen with packet details, Network details, Indication of computer name, IP address, MAC address, Port number, status of network., Network & protocol analysis: Indication of packet serial number, file name, file size, file number, receiver name, receiver IP address , total packets, packet length, time out, protocol, topology, receiver, MAC address, port number, file send start time, file sent completion time, transmission time data rate(Mbps),percentage error. Detection of collision on live network. <b>Included Accessories:</b> 4 Wireless nodes, Exhaustive course material & references, PC to PC using connector, Sockets & stackable patch cords, External Power supply	02	
8	Bluetooth Development Board	Two Identical Modules choice to select any one as master /salve, Graphical LCD display on both modules, Bluetooth enabled devices detection, Designed considering all the Communication Standards, Data Generator should be provided on-board, Facility to connect with PC, Equipped with UART & USB port, Facility to use as a Computer independent Training System, include test points, supports GFSK modulation Test points should be provided to observe signals. <b>Included Accessories:</b> software to be provided, Antenna : Whip Antenna	02	
9	Data Formatting and Carrier Mod/Transmitter Trainer	On-board Unipolar to Bipolar conversion.& data inverter, On-board 8-bit Data Source & Clock Source, Supports data formats : NRZ (L), NRZ (M), RZ, AMI, RB, Biphase(Manchester), Biphase (Mark).supports carrier modulation : ASK, FSK, PSK, DPSK, QPSK, On-board carriers, Test Points, <b>Included Accessories:</b> CD Manual, Set of patch cord, Power cord.& Power supply with each module, Interconnection: sockets & Sufficient number of stackable patch cords	02	
10	Data Reformatting and Carrier Demodulation Receiver Trainer	On – Board Biphase Clock recovery, data squaring & Differential decoder circuit. On – Board Butterworth filters & Data Receiver, Supports different data reconditioning formats NRZ (M), NRZ(L) ,RZ, AMI, RB, Biphase (Manchester), Biphase (Mark). Supports carrier demodulation : ASK – Diode detector ,FSK, PLL Detector PSK /DPSK- Square Loop Detector QPSK –Fourth Power Loop Detector, Biphase Clock Recovery, Test points. <b>Included Accessories:</b> CD Manual, Set of patch cord, Power cord.& Power supply with each module, Interconnection: sockets & Sufficient number of stackable patch cords.	02	
11	Differential Pulse code Mod./Demodulation Trainer	Onboard DPCM Transmitter and Receiver, Onboard Signal Generator block, Onboard audio input & audio output processing circuit, Clock and control signal section, Detailed signal processing circuit with data and control signal.	02	
12	Mobile Phone Trainer (3G training platform)	Capability: Tri-Band UMTS 2100/1900/850MHz or 2100/1900/900MHz, LCD Display, Supports both GSM and WCDMA, Video call Specifications : Support standard WCDMA, Test points. <b>Included Accessories :</b> 5V DC Adaptor, Product Tutorials	02	

13	RFID Technology Trainer	Highly integrated analog circuitry to Demodulate & Decode, Provided with LCD and software, RS-232 Interface , On board Antenna, Test points, Modulation Type : ASK, Supports microcontroller, RFID cards to be provided : 25 Nos, On board programming facility through USB. <b>Included Accessories:</b> Application Software:: Security applications by using RFID technology, Should be supplied with 25 Passive Tags , E- Manual, Application software CD & Mains chord	02	
14	Sampling & reconstruction Trainer	Crystal controlled pulse generator ; On-board synchronized analog signal generator, Selectable sampling frequencies, Separate sample and sample/hold outputs, On-board low-pass filters, Audio Input and Output links to show the transmission and reception of real time signal (audio signal). <b>Included Accessories:</b> : Should be supplied with technology teaching & simulation software	02	
15	TDM Pulse Amplitude Modulation/De modulation Trainer	Analog Input Channels : 3 to 4 channels, Multiplexing : Time Division Multiplexing, Modulation : Pulse Amplitude Modulation, On board analog signal of different frequencies. Clock Regeneration at Receiver: Using PLL; Test points. <b>Included Accessories:</b> Set of patch cord, Sockets & sufficient number of stackable patch cords	02	
16	TDM Pulse Code Demodulation Receiver Trainer	On board analog signal of different frequencies, Multiplexing : Time Division Multiplexing Modulation : Pulse Code Modulation , Sync Signal : Pseudo Random Sync Code Generator Error Check Code : Off – Odd – Even – Hamming, Test points, Receiver should have On Board Low pass Filters , On Board PLL for clock regeneration ; On Board Sync code Detector , Error check code options , Odd or even parity –Single bit error detection ; Hamming code single bit error detection & correction , Switched faults for different error check code options Input Channel : Time Division Multiplexed serial Input Demodulation : Pulse Code Demodulation	02	

**TOTAL OF SCHEME-I**

**SCHEME- II (MICROWAVE ENGINEERING LAB)**

Item No.	Name of Item	Specifications	Qty.	Approx. Cost (Amount in Rs.)
01.	Klystron test bench with following equipments (Klystron Tube)	<p><b>X-band</b></p> <ul style="list-style-type: none"> <li>• <b>Isolator</b> (8.2 to 12.4 GHz): Freq. Range: 8.2 to 12.4 GHz; Waveguide type: WR90; Flange type : UG/U 39; Max VSWR: 1.15; Min Isolation: 25 dB; Min insertion loss: 0.4 dB</li> <li>• <b>Frequency Meter:</b> Freq. Range: 8.2-12.4 GHz;</li> <li>• <b>Variable Attenuator:</b> Freq. Range: 8.2 to 12.4 GHz; Waveguide type: WR90; Flange type : UG/U 39;</li> <li>• <b>Slotted Section:</b> (8.2-12.4 GHz), Freq. Range: 8.2-12.4 GHz; Residual VSWR: 1.01; Slope: ±0.2dB; Waveguide: RG-52AJ; Flange: UG-39/U</li> <li>• <b>Tunable Probe:</b> Freq. Range: 8.2 to 12.4 GHz; Detector: IN-23; Output Connector: BNC(F);</li> <li>• <b>Detector Mount :</b> Freq. Range: 8.2-12.4 GHz; Crystal: IN-21; Output Connector: BNC(F); Waveguide: RG-52/U; Flange: UG-39/U</li> <li>• <b>Movable Short:</b> Freq. Range: 8.2 to 12.4 GHz; Waveguide: RG-52/U; Flange type : UG-39/U; Reflection Coefficient: 0.98;</li> <li>• <b>Matched Termination (8.2-12.4 GHz) :</b> Freq. Range: 8.2-12.4 GHz; Max VSWR: 1.02; Avg Power: 2W; Type: Fixed; Waveguide: RG-52/U; Flange: UG-39/U</li> <li>• <b>Slide Screw Tuner :</b> Freq. Range: 8.2 to 12.4 GHz; Waveguide: RG-52/U; Flange type : UG-39/U; Maximum VSWR: 20:1.02;</li> <li>• <b>Waveguide Stands</b> :X-band</li> <li>• <b>VSWR Meter:</b> Freq. Range: 8.2 to 12.4 GHz; <b>Sensitivity:</b> 0.2µV at a 200 ohms input for full scale</li> </ul>	03	

		<p>deflection. <b>Noise Level:</b> At least 5 dB below full scale at rated sensitivity and maximum band width input terminated in 100 ohms and 500 ohms for crystal low and high respectively. <b>Calibration:</b> Square law, meter indicates SWR, dB. <b>Range:</b> 70 dB, input attenuator provides 60 dB in 10 dB steps, accuracy <math>\pm 0.2</math> dB per 10 dB steps Maximum commutative error <math>\pm 0.5</math> dB. <b>Scale selector:</b> Normal Expand and <math>- 5</math>dB. <b>Meter Scale:</b> SWR1-4, SWR 3-10 , expand SWR 1.1.3, dB 0-10, expand dB0.2 <b>Gain Control:</b> Adjust the reference level, variable range 0-10 dB approx. <b>Input:</b> “Bolo” bias provided for 4.3 mA low current bolo meters. <b>Recorder output:</b> Socket provided for recording having 1 V for full scale deflection, internal resistance of 1000 ohms or less. <b>A/C Output:</b> BNC connector for amplified output. <b>Input connector:</b> BNC (F). <b>Frequency:</b> 1000Hz <math>\pm 10\%</math>. <b>Power:</b> 230 volts A.C <math>\pm 50</math> Hz, mains supply.</p> <ul style="list-style-type: none"> <li>• <b>Solid State Klystron Power Supply:</b> Beam Supply Voltage Range: 195-400 V continuously variable Current: 45mA Max. Regulation: Better than 0.5% for <math>\pm</math> variation in Mains Supply Voltage Ripple: Less tan 5 mV rms. <b>Repeller Supply</b> Voltage Range: -10 V to -300 DC continuously variable with respect to Klystron cathode Regulation: 0-25% for <math>\pm</math> variation in Mains supply voltage. <b>Heater Supply</b> 6.3V DC (regulated). <b>Modulation</b> Square Wave: Freq. 500 Hz-1.7 KHz Max Amp. +110 Volt peak to peak Amplitude and frequency continuously variable Saw tooth: Freq. 50Hz-196 Hz Amplitude -60 V max peak to peak Amplitude and frequency continuously variable. <b>Operating Voltage</b> 230V <math>\pm 10\%</math>, 50 Hz, A.C.</li> <li>• <b>Cooling Fan with Stand, :</b> X-band</li> <li>• <b>Co-axial Cable (BNC) :</b> X-band</li> </ul>		
02.	Gunn Oscillator Microwave Test Bench	<p>X- Band,</p> <ul style="list-style-type: none"> <li>• <b>Gunn Oscillator: Freq Range:</b> 8.2-12.4 Ghz, <b>Pushing fac.</b> (MHz/V): 8 Bias Voltage Max.10V, Normal power output: 10 Temp Coeff.(MHz) <math>\pm 0.2</math>, Output connector : BNC (F), Freq Adjustment: By micrometer, WG: RG-52/U, Flange: UG-39/U.</li> <li>• <b>Pin Modulator: Freq. Range: 8.2-12.4 Ghz, Bias volts: 0.10 volts,,</b> Output connector : BNC (F), WG: RG-52/U, Flange: UG-39/U.</li> <li>• <b>Isolator: (8.2 to 12.4 GHz) :</b> Freq. Range: 8.2 to 12.4 GHz; Waveguide type: WR90; Flange type : UG/U 39; Max VSWR: 1.15; Min Isolation: 25 dB; Min insertion loss: 0.4 dB.</li> <li>• <b>Frequency Meter:</b> Freq. Range: 8.2-12.4 GHz.</li> <li>• <b>Variable Attenuator:</b> Freq. Range: 8.2 to 12.4 GHz; Waveguide type: WR90; Flange type : UG/U 39.</li> <li>• <b>Slotted Section:</b> (8.2-12.4 GHz), Freq. Range: 8.2-12.4 GHz; Residual VSWR: 1.01; Slope: <math>\pm 0.2</math>dB; Waveguide: RG-52AJ; Flange: UG-39/U, <b>XS-651.</b></li> <li>• <b>Tunable Probe :</b> Freq. Range: 8.2 to 12.4 GHz; Detector: IN-23.</li> <li>• Output Connector: BNC(F); <b>XP-655.</b></li> <li>• <b>Detector Mount (8.2-12.4 GHz):</b> Freq. Range: 8.2-12.4 GHz; Crystal: IN-21; Output Connector: BNC(F); Waveguide: RG-52/U; Flange: UG-39/U.</li> <li>• <b>Movable Short:</b> Freq. Range: 8.2 to 12.4 GHz; Waveguide: RG-52/U; Flange type: UG-39/U; Reflection Coefficient: 0.98.</li> <li>• <b>Matched Termination:</b> (8.2-12.4 GHz) Freq. Range: 8.2-12.4 GHz; Max VSWR: 1.02; Avg Power: 2W; Type: Fixed; Waveguide: RG-52/U; Flange: UG-39/U.</li> <li>• <b>Slide Screw Tuner :</b> Freq. Range: 8.2 to 12.4 GHz; Waveguide: RG-52/U; Flange type : UG-39/U; Maximum VSWR: 20:1.02;</li> <li>• <b>Waveguide Stands:</b> X-band.</li> <li>• <b>VSWR Meter:</b> Freq. Range: 8.2 to 12.4 GHz;</li> </ul>	02	

**Sensitivity:** 0.2 $\mu$ V at a 200 ohms input for full scale deflection. **Noise Level:** At least 5 dB below full scale at rated sensitivity and maximum band width input terminated in 100 ohms and 500 ohms for crystal low and high respectively. **Calibration:** Square law, meter indicates SWR, dB. **Range:** 70 dB, input attenuator provides 60 dB in 10 dB steps, accuracy  $\pm 0.2$  dB per 10 dB steps Maximum commutative error  $\pm 0.5$  dB. **Scale selector:** Normal Expand and  $-5$ dB. **Meter Scale:** SWR1-4, SWR 3-10, expand SWR 1.1.3, dB 0-10, expand dB0.2. **Gain Control:** Adjust the reference level, variable range 0-10 dB approx. **Input:** "Bolo" bias provided for 4.3 mA low current bolo meters. **Recorder output:** Socket provided for recording having 1 V for full scale deflection, internal resistance of 1000 ohms or less. **A/C Output:** BNC connector for amplified output. **Input connector:** BNC (F). **Frequency:** 1000Hz  $\pm 10\%$ . **Power:** 230 volts A.C  $\pm 50$  Hz, mains supply.

- **Cooling Fan with Stand:** X-band.
- **Co-axial Cable (BNC) :** X-band
- **Gunn Power Supply: Voltage Range:**0 -12 volts variable, **Current:** 1 Amp. Max, Regulation: 0.2 $\pm$ 10% variation in the mains supply voltage, Ripple: 1 m V rms, Modulation Freq. : 1 KHz  $\pm 20\%$  ( 900-1100 Hz), Output Connector BNC (F) for Gunn oscillator and TNC (F) for Pin modulator Model GS-610.
- **Directional Couplers (10 dB):** Freq. Range: 8.2-12.4 GHz; , Coupling: 3 $\pm$ 0.6dB, 10 $\pm$ 0.6dB, 20 $\pm$ 0.8dB; Directivity: 35; VSWR (Main Line): 1.12; VSWR (Auxillary Line): 1.2.
- **Directional Couplers (20dB):** Freq. Range: 8.2-12.4 GHz; Coupling: 3 $\pm$ 0.6dB, 10 $\pm$ 0.6dB, 20 $\pm$ 0.8dB; Directivity: 35; VSWR (Main Line): 1.12; VSWR (Auxillary Line): 1.2.
- **Directional Couplers (3dB):** Freq. Range: 8.2-12.4 GHz; Coupling: 3 $\pm$ 0.6dB, 10 $\pm$ 0.6dB, 20 $\pm$ 0.8dB; Directivity: 35; VSWR (Main Line): 1.12; VSWR (Auxillary Line): 1.2.
- **Match Termination (8.2-12.4 GHz):** Freq. Range: 8.2-12.4 GHz; Max VSWR: 1.02; Avg Power: 2W; Type: Fixed; Waveguide: RG-52/U; Flange: UG-39/U.
- **Frequency meter :** Freq. Range: 8.2-12.4 GHz; Micrometer Type.
- **Magic Tee :** Freq. Range: 8.2 to 12.4 GHz; Waveguide type: WR90; Flange type : UG/U 39.
- **H-Plane Tee:** Freq. Range: 8.2 to 12.4 GHz; Waveguide type: WR90; Flange type : UG/U 39.
- **Isolator (8.2 to 12.4 GHz) :** Max VSWR: 1.15; Min Isolation: 25 dB; Min insertion loss: 0.4 dB.
- **Circulator (T-type) :** Freq. Range: 8.2 to 12.4 GHz; Waveguide type: WR90; Flange type : UG/U 39; Max VSWR: 1.20; Min Isolation: 20 dB; Min insertion loss: 0.4 dB.
- **Waveguide Horns:** Freq. Range: 8.2 to 12.4 GHz; Waveguide: RG-52/U; Flange type: UG-39/U; Maximum VSWR:1.2; Gain : 15 Pyramidal.
- **MIC Antenna :** Rectangular antenna with Transformer coupling Freq.Range: 8.2 to 12.4 GHz : Substrate Used: Neltech
- **Dielectric Constant:** 3.2, Constant:Thickness :0.762 mm, Width : 1.834.

TOTAL OF SCHEME-II

**SCHEME – III (MICROCONTROLLER AND INTERFACING LAB)**

<b>Item No.</b>	<b>Name of Item</b>	<b>Specifications</b>	<b>Qty.</b>	<b>Approx. Cost (Amount in Rs.)</b>
1.	Keil software	Software: KEIL PK51-ED;C51 Professional Developer's Kit A51 Assembler + C51 Compiler, $\mu$ Vision Simulator and Target Debugger LX51 Code Packing, Linker Extended Device Support, In-System Debugging with ISD51+ Flash MonitorRtxTiny2 Real-Time OS ULINK Driver for ST $\mu$ PSD and Infineon XC800 Driver for ADuC83x/84x. License Type: Node Locked – Class Room	<b>01 for 25 users</b>	
2.	Keil kits or ESA MCB 51-2 Evaluation Board	The 8051 microcontroller supports 8051 deriver including the extended memory and instruction set. KEIL compatible evaluation board which allows you to create and test working programs for 8051 Microcontroller. It supports numerous 8051 compatible devices. It allows you to explore the capabilities of the 8051 and develop applications with KEIL development tools ( KEIL uVision IDE)	<b>10</b>	
3.	PIC kits	ESA-SAR-PIC 03 Trainer Module: PIC16f87x based low cost high performance based on Microchip. ESA-SAR-PIC 03 based on PIC 16F877 controller and supported with MPLAB for developing the user applications.	<b>10</b>	
<b>TOTAL OF SCHEME-III</b>				

**ANNEXURE-II**

I/We (Name)\_\_\_\_\_

Contractor / partner / sole proprietor (strike out word which is not applicable) or (Firm)/Company  
\_\_\_\_\_ do hereby solemnly affirm and declare that the individual  
firm / companies are not black-listed by the Union or State Government or any autonomous body.

DEPONENT

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

I/We do hereby solemnly affirm and declare that the above declaration is true and correct to the best of my knowledge and beliefs. No part of it is false and nothing has been concealed.

Dated:

DEPONENT

**CHECK LIST DULY FILLED IN TO BE ATTACHED WITH PRE-QUALIFYING-CUM-TECHNICAL  
BID FOR THE EQUIPMENT FOR ELECTRONICS & COMMUNICATION ENGINEERING  
DEPARTMENT**

- |    |  |        |
|----|--|--------|
| 1. | Whether EMD in the shape of FDR or Deposit at Call or Term Deposit Receipt or Demand Draft valid for three months, for the asked-for amount attached?              | Yes/No |
| 2. | Whether tender document duly signed by authorized Signatory attached?  | Yes/No |
| 3. | Whether affidavit duly attested by Notary / Executive Magistrate regarding non-black listing of firm Attached?   | Yes/No |
| 4. | Whether a list of institutions / organizations where your firm has supplied this item / equipment / instrument recently, is attached.                              | Yes/No |
| 5. | If you are an authorized agent / dealer / distributor of the firm / company / manufacturer and whether authority letter as issued by them in your favour attached? | Yes/No |
| 6. | Whether Technical broucher of the equipments attached?   | Yes/No |

Signature of authorized signatory  
with seal of the firm

