

INDIAN INSTITUTE OF TECHNOLOGY RAJASTHAN
MBM Engineering College Campus, Ratanada, Jodhpur – 342011.

**TENDER FOR SUPPLY OF LAB EQUIPMENTS FOR Electromagnetics /
Microwave Laboratory**
Tender Enquiry No: IITJ/TEN/2010-11/EE/32

DATED: October 27, 2010

Due Date of Submission: 4:00 pm on 27th November 2010

Background:

The Electrical Engineering Department at IIT Rajasthan currently plans to set up Electromagnetics/Microwave Lab for UG/PG Programmes. Sealed quotations are invited from reputed vendors for supplying various lab equipments as per the details given in the Annexure - I to Annexure – II.

1. Eligibility Criteria of Bidders:

- a) Bidder should be OEM/Authorized Partner of the OEM and a Letter of Authorization from OEM, specific to the tender should be enclosed.
- b) The Bidder should be Authorized Service Provider for the OEM.
- c) The firm/company should be ISO 9001 certified (Maintenance & System Integration). Please attach a copy of the certificate.
- d) Bidder should be financially sound to execute the order. Certificate to this effect should be issued by any Nationalized/Scheduled bank.
- e) The bidder shall provide the Registration number of the firm along with the LST/ CST/ WCT No. and the PAN Number allotted by the concerned authorities.
- f) The bidder must have experience of executing similar orders. The bidder must enclose documentary evidence of executing minimum 3 orders of a minimum value of Rs. 50 Lakhs each in the last 3 financial years for any Educational Institution/University/Organization.
- g) The bidder should have a Call Centre operating in or around Rajasthan and the telephone number for the same must be provided.
- h) The bidder should have adequate facilities, manpower and staff for installation, testing, commissioning and for providing after sales service. An undertaking from the OEM is required in this regard stating that they would facilitate the bidder on a regular basis with technology/product updates and extend support for the warranty as well.
- i) The bidder must have experience of executing similar orders. Details & proof of Service facilities for Technical Support on Services be attached.
- j) Latest Income Tax Certificate should be enclosed.
- k) The bidder should submit copies of income tax return filed for previous two financial years preceding the current financial year.
- l) The bidder must not be black-listed by any company or organization within India or abroad for whatsoever reason during the last 10 years. A certificate or an undertaking to this effect must be submitted with the bid.

2. Earnest Money Deposit: The tenderer shall deposit Earnest Money of Rs. 4,00,000.00 /- (Rupees Four Lakhs only) and a separate demand draft of Rs. 1000/- (Rupees One Thousand only) towards non refundable tender fee by way of demand draft drawn in favour of "Director, IIT Rajasthan" payable at Jodhpur. The earnest money deposit will be refunded to the bidders, whose offers are not accepted within 90 days of opening of the tenders. Earnest Money Deposit of the tenderer whose offer is accepted will be kept as interest free security deposit till the successful completion of the contract. In the event of the tenderer backing out before the actual award or execution of the agreement, Institute will have the right to forfeit the earnest money in full.

3.Submission of Proposals:

a)The bidder shall go through the entire document and must comply with all the terms and conditions. A Compliance statement in the form of "Complied" or "Not Complied" shall be given against each item and specification of the tender document (Annexure – II). The compliance statements should be supported by authentic documentation. Please note that any deviation from the laid down requirements / specification shall be brought out separately in deviation sheets to be attached with concerned section of the tender. Failure to comply with this requirement may result in the bid being rejected. Each page of the bid and cuttings / corrections shall be duly signed and stamped by the bidder. Failure to comply with this requirement may result in the bid being rejected.

b)The proposals shall be submitted in two parts and should be super-scribed as "PART – I: COVER FOR TECHNICAL BIDS" and "PART-II: COVER FOR COMMERCIAL BIDS" (**due date 27.11.2010 (up to 4:00 PM)**) and the vendor name/address on all the two envelopes. The envelope cover must carry the NIQ reference and the vendor name and address. All the two sealed envelopes shall be submitted in a larger envelope with the NIQ reference and vendor name and address. This envelope should be duly signed by an authorized signatory and should bear the inscription as under:

"Supply and Installation of Lab Equipments for Electromagnetics/Microwave Lab"
Tender Enquiry No.: IITJ/TEN/2010-11/EE/32
Dated: 27 October 2010

c)Part-I shall be a Company Profile covering all the documents specified in the "Eligibility Criteria of Bidders" under clause 2 above, as well as a Technical Offer with full details including description of product so as to enable technical assessment of the proposal and categorical clause wise compliance statement as per Annexure - I to Annexure III.

d)The Technical bid must be submitted in an organized and structured manner. No brochures/leaflets etc. should be submitted in loose form. The Technical Offer should comprise the following:

- i.A letter of authority duly signed by an authorized signatory.
- ii.Two separate demand drafts, one for Earnest Money deposit and the other of Rs. 1000/- as the non-refundable tender fee.
- iii.Complete Information of Commercial bid with Product Name, Specification, and Manufacturer quoted for.
- iv.Columns related to commercials must not be filled up.
- v.Technical Documentation [Product Brochures, leaflets, manuals etc.]

- vi. Delivery and implementation schedule.
- vii. Compliance of terms with any deviation clearly indicated in remarks & brought in separate deviation sheets.
- viii. Warranty and AMC (Comprehensive Annual Maintenance) details.

e) Part – II should contain The Commercial Bids for the entire proposal with breakup of the prices. The bidders are requested to quote

i. Product Name, Specification, Manufacturer with charges for installation, configuration and support for solution.

ii. Prices quoted shall be inclusive of escalation of any description. The rates must be quoted including the following:

A) All costs should be given in Figures and Words.

B) Govt. Levies like Sales Tax, Octroi, Excise Duty, Work Contract Tax (WCT) and Educational cess etc.

4. Bids Acceptance: The Bids must reach the office of the Director, IIT Rajasthan, on or before the due date, i.e., on 27th November 2010, 4 pm. Bids will not be accepted after the due date and time.

5. Validity of bids: Bids should be valid for a minimum period of 120 days after the due date.

6. Rejection of Bids:

a) The Director, IIT Rajasthan reserves the right to accept or reject any bid or cancel the tender proceedings without assigning any reason whatsoever.

b) The Director, IIT Rajasthan at its sole discretion reserves the right to award/reject the contract in one or more parts to one or more bidders. Incomplete quotations are liable to be rejected.

c) Canvassing in any form in connection with the tenders is strictly prohibited and the bids submitted by the bidders who resort to canvassing are liable for rejection.

d) The Director IIT Rajasthan shall not pay any costs incurred towards preparation and submission of the bid or any other expenditure in this regard.

e) Unsigned tenders, unattested corrections and over writings by bidders are also liable for rejection.

f) The Director may relax any technical specification if necessary.

g) Conditional bids will be summarily rejected.

h) The schedule for accepting the tenders shall be strictly followed- late tenders shall not be accepted.

7. Evaluation Process: For the bidders satisfying the Qualifying Criteria and Technical Specifications, the price comparisons shall be made over the total cost of the solution with three years of warranty. The bidder with the lowest price (L1) will normally be selected from the bidders satisfying the Qualifying Criteria & Technical Specifications. However, the Director of IIT Rajasthan or the authorized committee, at its sole discretion, reserves the right to negotiate with other bidders in case, the technical specifications of some or all products are found to be superior.

8. Prices & Payment Terms:

- a) The bidders are requested to quote in foreign currency on CIF, FOB, Ex-Work basis inclusive of all Packing, Forwarding, Freight charges, Transit Insurance and any other charges as applicable, as per Annexure - II in INR with 3 year Comprehensive Warranty.
- b) IIT Rajasthan is registered with DSIR, Govt. of India and is, therefore, partially exempted from Excise/Custom Duty. Exemption Letter for Excise/Custom Duty, if required, shall be issued by IIT Rajasthan, as and when required/asked for.
- c) Full payment will be made after the complete delivery, installation and commissioning of the products.

9. Clarifications: In case the bidder requires any clarification regarding the tender documents, they are advised to submit their queries in writing to Dr. Akhilesh Mohan (amohan1232001@gmail.com), Assistant Professor, IIT Rajasthan, Jodhpur on or before **05/11/2010** by 4:00 pm. There will be no pre-bid meeting for this tender.

10. Quantity Variations: The proposed quantities are subject to change depending on IIT Rajasthan's priority vis-à-vis financial constraints, if any.

11. Comprehensive Warranty & Comprehensive Annual Maintenance Contract:

- a) Comprehensive Warranty & Comprehensive Annual Maintenance Contract shall include free maintenance of the whole equipment supplied including free replacement of parts. The defects, if any, shall be attended to, on an immediate basis, but in no case any defect should prolong for more than 24 hours.
- b) The comprehensive **on-site** warranty shall be for a period of **three year** from the date of installation of the equipment by IIT Rajasthan.
- c) The bidders should also quote for Comprehensive Annual Maintenance Contract after warranty for a subsequent period of two years on quarterly post-payment basis.

12. Supply and Installation:

- a) This is a time bound and high priority project. The bidder must make the proposal after fully considering all such factors, which may have any bearing on the time schedule. The bidder will be required to supply and install at the said location within **6 weeks** from the date of receiving the purchase order. However, the bids with lesser lead time will be given preference.
- b) The Director, IIT Rajasthan will have the right to reject the component/equipments supplied, if it does not comply with the specifications at any point of installation/inspections.

13. Liquidated Damages: If the supplier fails to deliver any or all of the goods or complete the installation within the period specified in the purchase order, IIT Rajasthan shall without prejudice to its other remedies, deduct as liquidated damage 1% of the price of the delayed goods for every week or part thereof subject to a maximum of 10% of the order value. The amount towards Liquidated Damage would be recovered while making the initial payment itself.

14. Penalty Clause: In case of non-supply of goods after the acceptance of purchase order, the supply order shall be placed with the next bidder which has quoted the next lowest rates at the risk and cost of the defaulting bidder and difference, if any, between the total cost of the materials shall be chargeable to the defaulting bidder. In case the

defaulting bidder fails to pay the differential cost, the legal action shall be taken against the defaulting bidder.

15. Force Majeure: Any delay due to Force Majeure will not be attributable to the bidder.

16. Arbitration and Laws: Except where otherwise provided for in the contract, all questions and disputes relating to interpretation and application of the provisions of the contract shall be settled mutually within thirty (30 only) days (or such longer period as may be mutually agreed upon) from the date that either party notifies in writing that such dispute or disagreement exists, under the Rules of Indian Arbitration and Conciliation Act, 1996. The venue of Arbitration shall be Jodhpur, Rajasthan, India. The arbitration resolution shall be final and binding upon the parties and judgement may be entered thereon, upon the application of either party, by Jodhpur court having jurisdiction. The Indian laws shall govern this contract.

17. Termination Clause: Either party can terminate the service agreement by giving three months notice in advance to other party.

Place:

(Signature & Seal of Bidder)

Date:

ANNEXURE - I

GENERAL TERMS AND CONDITIONS:

- 1.Prices:** Vendor should quote CIF, FOB, Ex-work prices in foreign currency.
- 2.Delivery Period:** Within 6 Weeks from date of receipt of Purchase Order.
- 3.Warranty:** Three Years Comprehensive Warranty.
- 4.AMC:** Per year AMC charges. AMC quote should be provided SEPARATELY. *This is not to be included in the total price as per item 1.*
- 5.Consignee or Bill to:** The Director, IIT Rajasthan
- 6.Terms of Payment:** As under 'Prices & Payment Terms' clause 8.
- 7.Institute's Rights:** Director, IIT Rajasthan reserves the right to accept or reject any or all the bids without assigning any reason thereof.
- 8.**Queries related to the tender can be made only through emails/posts on or before 05th November 2010. There will be no pre-bid meeting.
- 9.Last date of bid submission:** 27th November 2010, 4:00 pm.
- 10.Bid opening :**
 - 1.**Technical Bid: 29th November 2010, 10:30 am
 - 2.**Financial Bid: 03th December 2010, 10:30 am
- 11.** Bidders or their representatives are permitted to attend the tendering procedure. However, they must reach the venue before the scheduled time.

ANNEXURE – II

1. Two-Port Vector Network Analyzer (VNA) – 3 GHz – 3 Nos

S.No.	Parameters	Specifications
1	Frequency Range	300 kHz to 3 GHz
2	Source Frequency Stability (short term)	Better than ± 0.05 ppm
3	Source Frequency Stability (long term)	Better than ± 0.5 ppm/year
4	Number of Test ports	2 Ports, 50 ohm, type N , female connectors
5	Frequency Resolution	1 Hz
6	Maximum Test port output (source) power	10 dBm minimum
7	Source level accuracy	± 0.65 dB (at 0 dBm, 50 MHz absolute)
8	Source level linearity	± 1.5 dB or better(at -20to +10 dBm)
9	Level Resolution	0.05 dB minimum
10	Test port output signal purity Harmonics Non Harmonics Spurious	Less than -20 dBc (at 5 dBm) Less than -30 dBc (at 5 dBm)
11	Maximum test port input level	10 dBm
12	Test port input trace noise a. Magnitude b. Phase	0.004 dBrms or better 0.035 degree rms or better
13	Test port input stability a. Magnitude b. Phase	± 0.01 dB/degree C or better ± 0.2 degree /degree or better
14	Test port input dynamic accuracy relative o -10dBm reference input power level a. Magnitude b. Phase	± 0.21 dB or better ± 5 degree or better
15	Damage level	+26 dBm or more
16	Dynamic range at IF BW 10 Hz (500 MHz to 3 GHz)	120 dBm minimum
17	IF Bandwidth	10 Hz to 30 KHz
18	No. of Points	2 to 1601 minimum
19	Measurement time for 201 no. Of points with CF 1.1 GHz, span 100 Mhz, automatic correction and display off.	6 ms or less
20	Manual Calibration Kit	N Type
21	Electronic Calibration Kit	N Type
22	Uncertainty of transmission measurements above 50 MHz, at measurements bandwidth of 10 Hz and a source power of -10 dBm. Transmission Coefficient from 10 dB to -50 dB Magnitude Uncertainty Phase Uncertainty	Less than 0.2 dB Less than 2 degree
23	Screen	Minimum 10 inch TFT color LCD, preferably with Touch Screen feature
24	Interface	GPIB, LAN, USB along with necessary software
25	Precision standard 50 Ohm RF cables to be used with Network analyser Length 61 cm or more	N -male to N-male 2 Nos.
26	EMC	IEC/EN 55011 group 1, class A, CISPR 11

		IEC/EN 61326 or equivalent.
27	VNA should have capability to perform frequency offset measurements and harmonic measurements	
28	VNA should have capability to perform time domain measurements	
29	Mouse, key board, operating manual hard and soft copy, power cord should be included.	
30	Warranty period of three years from the date of acceptance of the instrument	

2. Two-port Vector Network Analyzer (VNA) – 20 GHz – 1 No

S.No.	Parameters	Specifications
1	Frequency Range	300 KHz to 20 GHz
2	Resolution	1 Hz
3	Source stability and CW accuracy	±5 ppm (5 to 40 °C)
4	Number of measurement points	1601 minimum
5	Power range	-85 to +7dBm from 300KHz to 10.5 GHz -85 to 0dBm from 10.5GHz to 20 GHz
6	Maximum test port input level	+10 dBm from 300KHz to 20 GHz
7	Crosstalk	-110dB from 10 MHz to 45MHz -112 dB from 45 MHz to 15 GHz -106 dB from 15 GHz to 20 GHz
8	Dynamic range (10 Hz IF BW)	
	10 MHz to 100 MHz	120 dB , typ 129 dB The specification might not be met at 5 MHz or 50 MHz.
	100MHz to 8.5 GHz	117 dB , typ 127 dB
	8.5 GHz to 10.5 GHz	105 dB , typ 115 dB
	10.5 GHz to 20 GHz	96 dB ,typ 105 dB
10	Test port noise floor	
	100 Mhz to 8.5 Ghz	typ -130 dbm/Hz
	8.5 GHz to 20 Ghz	typ -115 dBm/Hz
11	IF Bandwidth	10 Hz to 500 KHz
12	No of Ports	2 ports
13	Port 1& 2 Connector	3.5 mm (male)
14	Trace Noise Magnitude	0.006 dBrms (300 KHz to 8.5 GHz) 0.023 dBrms(8.5 GHz to 20 GHz)
15	Phase Noise (10 KHz Offset) from center	< -65 dBc/ Hz upto 20 GHz
	Stability magnitude	
	300 kHz to 3 GHz	0.005 dB/°C
	3 GHz to 6 GHz	±0.01 dB/°C
	6 GHz to 20 GHz	±0.04 dB/°C
	Stability phase	
	300 kHz to 3 GHz	±0.1 deg/°C
	3 GHz to 6 GHz	±0.2 deg/°C
	6 GHz to 20 GHz	±0.8 deg/°C
16	Damage input level	+26 dBm or ±35 VDC
17	Directivity	42 dB from 300 KHz to 2 GHz 36 dB from 2 GHz to 20 GHz
18	Source match	37 dB from 300 KHz to 2 GHz 28 dB from 2 GHz to 20 GHz
19	Load match	42 dB from 300 KHz to 2 GHz

		36 dB from 2 GHz to 20 GHz
20	Reflection tracking	±0.003 from 300 KHz to 2 GHz ±0.008 from 2 GHz to 20 GHz
21	Transmission tracking	±0.068 from 300 KHz to 2 GHz ±0.208 from 2 GHz to 20 GHz
22	Display	10.4 in TFT color LCD with touch screen
23	Interface	GPIB, USB, LAN, along with necessary software
24	Upgradeable to Vector Mixer Calibration	
25	High End Manual Calibration Kit, X Band Wave-guide Calibration Kit and P band wave-guide Calibration kit	3.5 mm
26	Electronic Calibration Kit	3.5 mm
27	Flexible Precision Cable 50 Ohm; 3.5 mm(f) Rugged/ 3.5mm mm(m) DU	2 nos
28	Step Attenuator	
29	Uncertainty of transmission measurements above 50 MHz, at measurements bandwidth of 10 Hz and a source power of -10 dBm. Transmission Coefficient from 10 dB to -50 dB Magnitude Uncertainty Phase Uncertainty	Less than 0.2 dB Less than 2 degree
30	Material Characterization software and Dielectric Probe kit Upgradeable	To determine the intrinsic electromagnetic properties of many dielectric materials. Software should automate complex permittivity and permeability measurements. This software should be able to control the network analyzer and guide the user through easy setup and measurements. Software should support variety of measurement methods and mathematical models (Nicolson-Ross, NIST Precision, Fast, Short-backed, Arbitrary-backed, Single/Double, etc.) are provided to meet most application needs
31	EMC	IEC/EN 55011 group 1, class A, CISPR 11 IEC/EN 61326 or equivalent.
32	VNA should have capability to perform frequency offset measurements and harmonic measurements	
33	VNA should have capability to perform time domain measurements	
34	Mouse, key board, operating manual hard and soft copy, power cord should be included.	
35	Warranty period of three years from the date of acceptance of the instrument	

3. Spectrum Analyser- 3.6 GHz – 3 Nos

S.No.	Features	Specifications
1	Frequency range	9 kHz to 3.6 GHz
2	Analysis Bandwidth	10 MHz
3	Resolution Bandwidth	1 Hz to 3 MHz (10% steps), 4, 5, 6, 8 MHz
4	Resolution Bandwidth Accuracy	±2% nominal
5	Video Bandwidth	1 Hz to 3 MHz (10% steps), 4, 5, 6, 8 MHz and wide open (labeled 50 MHz)
6	Video Bandwidth Accuracy	±6% nominal
7	Frequency Span	0 Hz, 10 Hz to 3.6 GHz
8	Frequency Span Resolution	2 Hz
9	Frequency Span Accuracy (FFT Mode)	±(0.10% x span + horizontal resolution)
10	Frequency Aging Rate Temperature Stability	±1 x 10 ⁻⁷ / year ±1.5 x 10 ⁻⁸
11	Amplitude Measurement Range Maximum Safe I/P	-140 to +23 dB + 30 dB

12	Sweep Points	1 to 40001
13	Sweep Time	Span = 0 Hz 1us to 6000s Span >= 10 Hz 1ms to 4000s
14	Marker Peak Search	5 ms
15	Remote measurement and LAN Transfer rate	6 ms
16	Local Measurement and Display update rate	11 ms (90/s)
17	Measurement/mode switching	75 ms
18	Sweep Mode	FFT and Swept
19	Selectivity	4.1:1 nominal
20	Marker Frequency Counter Resolution	0.001 Hz
21	Input Attenuator Range	0 to 60 dB, 2 dB steps
22	VSWR	< 1.2 : 1 upto 3.5 GHz <1.5 : 1 above 3.5 GHz
23	Display Scale Unit	dBm, dBmV, dBμV, dBmA, dBμA, V, W, A
24	Reference Level	-170 to +23 dBm in 0.01 dB steps
25	Trigger Mode	Free run, line, video, external 1, external 2, RF burst, periodic timer
26	Trace Detector	Normal, peak, sample, negative peak, log power average, RMS average, and voltage average
27	One - button power measurements	Channel Power, Occupied Bandwidth, Power Statistics CCDF, Spurious Emission, Spectrum Emission Mask (SEM)
28	Frequency Response	Frequency Specification 9 kHz to 10 MHz: ±0.8 dB 10 MHz to 3.6 GHz: ±0.6 dB
29	Display Average Noise Level	Frequency Specification 1 MHz to 7 GHz -147 dBm
30	Third Order Intermodulation distortion (TOI)	Frequency Distortion TOI 100 to 400MHz -80 dBc +10 dBm 400MHz-1.7GHz -82 dBc +11 dBm 1.7 to 3.6 GHz -86 dBc +13 dBm
31	Phase Noise	Offset Specification 100 Hz -84 dBc/Hz 10 kHz -99 dBc/Hz 100 kHz -112 dBc/Hz 1 MHz -132 dBc/Hz
32	Maximum Safe Input	+30dBm (1W)
33	Connectivity Interface	USB, LAN, GPIB,VGA
34	User Interface	Most advanced user interface in an analyzer / Open Windows XP operating system
35	System Upgradability	System must be upgradable for following measurements: Noise figure, phase noise measurement, AM FM & PM Demodulation capabilities & Vector Signal Demodulation capability.
36	Operating Temperature Range	5 to +50 °C
37	Operating System	Open Windows XP
38	Date Storage	Internal: 40 GB External Supports USB 2.0 compatible memory devices
39	Mouse, key board, operating manual hard and soft copy, power cord should be included.	
40	Warranty period of three years from the date of acceptance of the instrument	

4.Spectrum Analyser-26.5 GHz – 1 No

S.No.	Features	Specifications
1	Frequency range	9 kHz to 26.5 GHz
2	Analysis Bandwidth	10 MHz
3	Resolution Bandwidth	1 Hz to 3 MHz (10% steps), 4, 5, 6, 8 MHz
4	Resolution Bandwidth Accuracy	±2% nominal
5	Video Bandwidth	1 Hz to 3 MHz (10% steps), 4, 5, 6, 8 MHz and wide open (labeled 50 MHz)
6	Video Bandwidth Accuracy	±6% nominal
7	Frequency Span	0 Hz, 10 Hz to 3.6 GHz
8	Frequency Span Resolution	2 Hz
9	Frequency Span Accuracy (FFT Mode)	±(0.10% x span + horizontal resolution)
10	Frequency Aging Rate Temperature Stability	±1 x 10 ⁻⁷ / year ±1.5 x 10 ⁻⁸
11	Amplitude Measurement Range Maximum Safe I/P	-140 to +23 dB + 30 dB
12	Sweep Points	1 to 40001
13	Sweep Time	Span = 0 Hz 1us to 6000s Span >= 10 Hz 1ms to 4000s
14	Marker Peak Search	5 ms
15	Remote measurement and LAN Transfer rate	6 ms
16	Local Measurement and Display update rate	11 ms (90/s)
17	Measurement/mode switching	75 ms
18	Sweep Mode	FFT and Swept
19	Selectivity	4.1:1 nominal
20	Marker Frequency Counter Resolution	0.001 Hz
21	Input Attenuator Range	0 to 60 dB, 2 dB steps
22	VSWR	< 1.2 : 1 upto 3.5 GHz <1.5 : 1 above 3.5 GHz
23	Display Scale Unit	dBm, dBmV, dBμV, dBmA, dBμA, V, W, A
24	Reference Level	-170 to +23 dBm in 0.01 dB steps
25	Trigger Mode	Free run, line, video, external 1, external 2, RF burst, periodic timer
26	Trace Detector	Normal, peak, sample, negative peak, log power average, RMS average, and voltage average
27	One - button power measurements	Channel Power, Occupied Bandwidth, Power Statistics CCDF, Spurious Emission, Spectrum Emission Mask (SEM)
28	Frequency Response	Frequency Specification 9 kHz to 10 MHz: ±0.8 dB 10 MHz to 3.6 GHz: ±0.6 dB 3.6 GHz to 26.5 GHz: ±3.2dB
29	Display Average Noise Level	Frequency Specification 1 MHz to 26.5 GHz -140 dBm
30	Third Order Intermodulation distortion (TOI)	Frequency Distortion TOI 100 to 400MHz -80 dBc +10 dBm 400MHz-1.7GHz -82 dBc +11 dBm 1.7 to 3.6 GHz -86 dBc +13 dBm
31	Phase Noise	Offset Specification 100 Hz -84 dBc/Hz 10 kHz -99 dBc/Hz 100 kHz -112 dBc/Hz

		1 MHz –132 dBc/Hz
32	Maximum Safe Input	+30dBm (1W)
33	Connectivity Interface	USB, LAN, GPIB,VGA
34	User Interface	Most advanced user interface in an analyzer / Open Windows XP operating system
35	System Upgradability	System must be upgradable for following measurements: Noise figure, phase noise measurement, AM FM & PM Demodulation capabilities & Vector Signal Demodulation capability.
36	Operating Temperature Range	5 to +50 °C
37	Operating System	Open Windows XP
38	Date Storage	Internal: 40 GB External Supports USB 2.0 compatible memory devices
39	Mouse, key board, operating manual hard and soft copy, power cord should be included.	
40	Warranty period of three years from the date of acceptance of the instrument	

5.Specifications for 3 GHz Microwave Signal Generator – 3 Nos

S.No.	Parameters	Specifications
1	Frequency	100 KHz to 3 GHz
2	Frequency Resolution	0.01 Hz
3	Internal Ref Output & External reference in put signal	10 MHz
4	Sweep modes	Step sweep (equally or logarithmically spaced frequency steps), 2 to 65535 (step sweep), Linear or logarithmic List sweep (arbitrary list of frequency steps), 1 to 1601 (list sweep) Can also simultaneously sweep amplitude.
5	Dwell time	100 µs to 100 s
6	Output Power (at front panel)	-90dBm to 18dBm @ 3 GHz
7	Level accuracy Power –20 to < –10dBm	±1.4 dB across full frequency range
8	Minimum settable power	-130dBm
9	Harmonics : >2 GHz	< -50dBc
10	Non-harmonics	< -50dBc
11	Sub-harmonics	<-50dBc
12	Modulation	AM, FM, PM, Pulse Modulation
13	Modulation source	Internal and External
14	Internal Pulse Generator	Min. Pulse Width : 20ns PRF : DC to 5MHz
15	FM Deviation at 20 GHz	>=80MHz
16	PM deviation at 20GHz	≥ 40 radians
17	AM Depth	0 to 90%
18	External modulation inputs	Provision for AM, FM , PM, Pulse Modulation
19	SSB Phase noise @ Frequency of: < 1.5GHz < 3 GHz	20 kHz offset from carrier -113 dBc/Hz -100 dBc/Hz
20	Programming interfaces	LAN,GPIB (with SCPI Command Compatibility), LXI compliant
21	Output connector (50 Ohms)	Precision 3.5 mm (m)
22	Sweep output	0V to 10V output proportional to frequency or power sweep operation

23	Temperature Range	0° to +55° C
24	Warranty period of three years from the date of acceptance of the instrument	

6.20 GHz Micro-wave Signal Generator – 1 Nos

S.No.	Parameters	Specifications
1	Frequency	250 KHz to 20 GHz
2	Frequency Resolution	0.01 Hz
3	Internal Ref Output & External reference in put signal	10 MHz
4	Sweep modes	Step sweep (equally or logarithmically spaced frequency steps), 2 to 65535 (step sweep), Linear or logarithmic List sweep (arbitrary list of frequency steps), 1 to 1601 (list sweep) Can also simultaneously sweep amplitude.
5	Dwell time	100 µs to 100 s
6	Output Power (at front panel)	-90dBm to 14dBm @ 17 GHz
7	Level accuracy Power -20 to < -10dBm	±1.4 dB across full frequency range
8	Minimum settable power	-130dBm
9	Harmonics : >2 GHz	< -50dBc
10	Non-harmonics	< -50dBc
11	Sub-harmonics	<-50dBc
12	Modulation	AM, FM, PM, Pulse Modulation
13	Modulation source	Internal and External
14	Internal Pulse Generator	Min. Pulse Width : 20ns PRF : DC to 5MHz
15	FM Deviation at 20 GHz	>=320MHz
16	PM deviation at 20GHz	≥ 160 radians
17	AM Depth	0 to 90%
18	External modulation inputs	Provision for AM, FM , PM, Pulse Modulation
19	SSB Phase noise @ Frequency of: < 1.5GHz <6GHz <12GHz <20GHz	@ 20 kHz offset from carrier -113 dBc/Hz -100 dBc/Hz -95 dBc/Hz -89dBc/Hz
20	Programming interfaces	LAN,GPIB (with SCPI Command Compatibility), LXI compliant
21	Output connector (50 Ohms)	Precision 3.5 mm (m)
22	Sweep output	0V to 10V output proportional to frequency or power sweep operation
23	Temperature Range	0° to +55° C
24	Warranty period of three years from the date of acceptance of the instrument	

7. Noise Figure Analyser – 1 Nos

It should have optimum performance Noise figure and gain specifications guaranteed for entire frequency range of NFA User interface dedicated to noise figure, also NFA provides emissions screening as standard Operates with SNS smart noise source to provide valid measurements even with temperature Variation Combine with associated Block Down-converters for measurements up to Higher frequency and Two GPIB ports providing LO control for mixer measurements & PC interface for ATE environments.

S.No.	Parameters	Specifications
1	Frequency range	10MHz to 3GHz
2	Measurement Bandwidth	4 MHz, 2 MHz, 1 MHz, 400 kHz, 200 kHz, 100 kHz
3	Number of Measurement	2 to 401, for fixed frequency

	Points	
4	Frequency reference Aging Temperature Stability	0.1ppm/ year 0.001ppm
5	Simultaneous measurement of Noise figure and Gain	
6	Measurement range Noise figure	Noise source ENR 4-7 dB 12-17 dB 20-22 dB 0 to 20 dB 0 to 30 dB 0 to 35 dB
7	Noise figure Measurement Uncertainty	Noise source ENR 4-7 dB 12-17 dB 20-22 dB $\pm < 0.05$ dB $\pm < 0.05$ dB $\pm < 0.1$ dB
8	Measurement range for Gain	-20 to +40 dB
9	Instrument uncertainty for gain	$\pm < 0.17$ dB
10	Instrument Own Noise figure 23° C \pm 3° C	< 5.9 dB + (0.00135 * freq in MHz)
11	RF input connector	N female, 50 Ω nominal
12	Modes of operation	Amplifier Down-converter in DUT Up-converter in DUT
13	System down-converter	Should allow use of an external down-converting mixer as part of the measurement system
14	LO control	Instrument capable of controlling an external LO via dedicated 'LO GPIB' connector
15	Loss compensation	Table of values vs. frequency for losses between noise source and DUT, and between DUT and analyzer
16	SNS Series noise source	Support for Smart noise sources and normal noise sources , appropriate noise source should be quoted
17	Display	17cm colour LCD
18	Connectivity	GPIB, LO-GPIB, Printer port, RS-232, VGA output
19	Temperature range	0° C to +55° C
20	Warranty period of three years from the date of acceptance of the instrument	

8. Power meter and sensor – 3 Nos

S.No.	Parameters	Specifications
1	No of channels	1
2	Measurements	Average, peak and peak-to-average ratio power measurements must be available with free-run or time-gated definitions. Time parameter measurements of pulse rise time, fall time, pulse width, time-to-positive occurrence and time-to-negative occurrence are also must be available.
3	Sampling rate	100Msa/s, continuous sampling
4	Video bandwidth	≥ 30 MHz
5	Single shot bandwidth	≥ 30 MHz
6	Rise time and fall time	≤ 13 ns
7	Time base range	2ns to 100ms/div
8	Predefined setups	Must be available for standards like GSM, EDGE, CDMA, HSDPA, WIMAX, DME etc
9	On-screen view for pulse measurements	Must be available with options for auto scale, auto gate.
10	Interfaces	GPIB, 10/100BaseT LAN(LXI compliant) and USB2.0
Power Sensor		
1	Frequency range	50 MHz to 18GHz
2	Dynamic range	-35 dBm to +20 dBm (≥ 500 MHz)

3	Damage level	+23 dBm (average power) +30 dBm (peak power)
4	Calibration	Automatic calibration should be available. However a 1mW power reference output also should be available for reference
5	Warranty period of three years from the date of acceptance of the instrument	

9. Arbitrary Function Generator – 05 Nos

- 14 bit, 50 Msa/s, 64 k point Arbitrary waveforms
- 20 MHz Sine and Square wave form
- Pulse, Ramp, Triangle, Noise and DC waveforms
- AM, FM, PM, FSK, PWM modulation types
- Linear and Logarithmic sweeps and burst operation
- 10 mVpp to 10Vpp amplitude range
- Graph mode for visual verification of signal settings
- Connect by USB, GPIB and LAN

10. Programmable DC Power Supply Triple Output Power 80W– 05 Nos

- Output Ratings:

Output 1 : 0-6V, 0-5 A

Output 2: 0 to +25V, 0-1A

Output 3: 0 to -25V, 0-1A

- Programming accuracy:

Voltage: 0.05% + 20 mV, 0.05%+20 mV, 0.1%+ 5 mV

Current: 0.15% + 4 mA, 0.15% + 4 mA, 0.2% + 10 mA

- Ripple Noise (20Hz to 20MHz)

Normal mode voltage: < 350 uVrms/ 2 mV p-p, < 350 uV rms/ 2V p-p, < 350 uV rms / 2 mV p-p

Normal mode Current: < 500 uA rms, <500 uA rms, < 2 mA rms

Common Mode current: <1.5 uA rms, < 1.5 uA rms, <1.5 uA rms

- Readback Accuracy:

voltage: 0.05% + 10 mV, 0.05% + 10 mV, 0.1% + 5 mV

current: 0.15% + 4 mA, 0.15% + 4 mA, 0.2% + 10 mA

- Connectivity: GPIB, RS232

Note for all microwave equipments:

- 1.Point to point compliance statement to be attached with technical data and values.
- 2.Equipment supplier should be original manufacturer or its authorized Indian representative.
- 3.Manufacturer should have their own instrument Calibration and Repairing facility in India.

4. Instrument should be calibrated and its certificate should be provided.

Annexure - III

We (The Bidder) undertake and confirm that:

1. We hereby offer to supply the goods detailed in schedule thereof as you specify in the purchase order at the price quoted and agree to hold this offer open for acceptance for a period of 180 days from the date of opening of bid.
2. Rates quoted as per Price and Payment Terms mentioned in Clause 8.
3. The entire product quoted has three years comprehensive on-site warranty.
4. The Bidder/OEM will maintain sufficient service engineers in Jodhpur, Rajasthan. The services shall be provided at IIT Rajasthan.
5. The product names for the total solution are mentioned and also enclosed the datasheets for the same.
6. The warranty in respect of the product ordered shall remain valid for three year from the mutually agreed date.
7. Any delay by the supplier in the performance or delivery of items shall render the supplier liable to cancellation of the purchase order for default. Further, the Bidder would ensure installation/commissioning of the Desktop computers with in time frame.
8. The bid/quotation is submitted for the complete Solution and strictly as per the tender specifications.
9. During warranty services will be provided directly on site.
10. Every page of the submitted bid has been numbered and signed.

It is hereby confirmed that we have understood the terms and conditions of the tender and have thoroughly examined specifications and are thoroughly aware of the nature of goods required and our offer is to supply goods strictly in accordance with the requirement and terms and conditions of the tender. We agree to abide by the terms and conditions of the tender if the contract is awarded to us.

“Bid Form” as specified in Annexure - IV has been included.

Place:

(Signature and seal of Bidder)

Date:

Annexure – IV

BID FORM

To
The Director,
IIT Rajasthan.

Dear Sir,

1.Having examined the terms & conditions of the document and specifications, the receipt of which is hereby duly acknowledged, we, undersigned, offer to supply and deliver the goods, in conformity with the said drawing, conditions of contract and specifications and services as per the terms & conditions of the contract, for the sums shown in the schedules of price attached herewith and made part of this bid.

2.We undertake, if our Bid is accepted, to execute the work within 03 weeks from the date of issue of your purchase order.

3.We agree to abide by this Bid for a period of 90 days from the date fixed for Bid opening and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

4.Until a formal Purchase Order of Contract is prepared and executed this Bid together with you written acceptance thereof in your notification of award shall constitute a binding contract between us.

5.Bid submitted by us is properly wax sealed and prepared so as to prevent any subsequent alteration and replacement.

We understand that IIT Rajasthan is not bound to accept the lowest or any bid that it may receive.

Dated this _____ day of _____

Signature of

In capacity of

Duly authorized to sign the bid for and on behalf of _____

Witness _____

Address _____

Signature & Seal