

## **Annexure-A**

### **Technical Specifications – Vector network analyzer (VNA) and Antenna Tripod**

<b>Specifications for Vector Network Analyzer</b>		
<b>Sl. No.</b>	<b>Parameter</b>	<b>Required Specifications</b>
1	Frequency Range	9 KHz to 26.5 GHz
2	Frequency resolution	1 MHz or better
3	Number of Ports	2 or more
4	Measurements Capability	i) Full 2-Port S-Parameters ii) Measurement Capabilities - VSWR, return loss, Smith Chart, Insertion Loss/Gain, Group Delay iii) Phase matching measurements iv) Amplitude matching measurements v) Z-Parameters, Y-Parameters vi) Wave quantities, Wave Ratios vii) Sweep type - Linear, Log, Power, CW, Segmented viii) Stability factor
5	DC Voltage Inputs	i) 2 Ports or more with BNC Female Connector at Front/Rear Panel of VNA ii) Voltage Range: $\pm 20$ V, $\pm 3$ V, $\pm 0.3$ V iii) Measurement Accuracy: 2 % of reading $\pm 0.02$ V iv) Input impedance: 1 MOhm or Better
6	Number of Channels & Traces	More than 20
7	Connector type	ruggedized 3.5 mm Male, 50 Ohms
8	Output Power	1 MHz to 20 GHz: +10 dBm 20 GHz to 26.5 GHz: +6 dBm
9	Minimum settable power	-30 dBm full frequency range
10	Aging Rate	$\pm 1$ ppm/year
11	Temperature Drift (+5 to 40 °C)	$\pm 1$ ppm
12	Initial Calibration accuracy	$\pm 0.5$ ppm
13	IFBW	1 Hz to 1 MHz
14	Number of measurement points	1 to 100,001
15	Sweep Cycle @ 500 KHz Bandwidth 1 MHz to 26.5 GHz	5 ms or better for 201 Sweep Points

16	Dynamic Range 10 MHz to 26.5 GHz	135 dB or better
17	Harmonics F > 50 MHz	-30 dBc typ
18	Trace Noise Magnitude (10 kHz IF BW) 10 MHz to 26.5 GHz	0.004 dB or better
19	Trace Noise Phase (10 kHz IF BW) 10 MHz to 26.5 GHz	0.05 ° or better
20	Power level linearity (source power ≥ -30 dBm)	≤ 1 dB
21	Maximum Nominal Input level	+10 dBm or better
22	Interfaces	USB type C and Type A Ports, LAN, HDMI, Display Port
23	Damage input power level	> +27dBm RF, 30 VDC
24	Reference Frequency	Ref In: 1 MHz to 20 MHz -10 dBm to +10 dBm Ref Out: 10 MHz +5 dBm to 10 dBm
25	Display	12.1" Touch screen colour display
26	Operating System	Windows Based
27	Supply Voltage	230V AC, 50 Hz
28	Control languages	SCPI Automatic recording of SCPI commands is preferable so that it simplifies automation procedures and provision to export to Python
29	Accessories Required	1) Phase Stable Cable Assy compatible to VNA on one side and 3.5 mm(M) on other side with return loss < 14 dB & Cable loss < 1.6 dB for each port 2) 3.5 mm Female (SOLT) Mechanical Calibration Kit
30	Warranty	01 Year for Instrument
31	Future Upgradable	Mixer Measurements, Time Domain Analysis

**Specifications for the Antenna tripod:**

1	Antenna Tripod (Qty 2 nos.)	Wooden Tripod compatible with Horn Antenna with Universal ball joint tiltable all round up to 25°, Antenna holder with captive ¼" screw, Legs extensible between 830 mm and 1360 mm.
---	-----------------------------	--

**Notes to bidder**

1. The bidder shall provide a compliance statement as per the format provided in Annexure-C of the tender. Each item not mentioned here but required for proper functioning of the instrument shall be quoted with the cost.
2. Proper combined specifications should be provided with the bid with pagination and index. The bidder shall clearly provide the model number or decoding sheet for the quoted model.
3. The bidder shall quote in a modular form as detailed in Annexure-E of the tender.
4. A minimum of one year guarantee/warranty shall be provided for all items from the date of installation for manufacturing defects.