Technical Specifications for the "Vector Network Analyser (VNA)"

The vendor must quote for a VNA whose specifications are given in the table below.

- The VNA should come with all the necessary accessories, cables and power supplies (compatible with standard Indian power systems) to enable to be operated and perform 2-port measurements.
- Safety features should be provided for the safety of the user and the instrument.
- The vendor should provide detailed specification sheet for the model being quoted.
- The suppliers must have supplied at least 5 systems of similar models.
- Bidder shall provide list of at least 3 customers along with contact information, where the similar system has already been installed.
- The vendor should provide at least one year warranty.
- A pdf version of the manual must be provided in case the item is purchased.
- The vendor must provide installation, demonstration and training of the VNA and the electronic calibration kit at the IITM location.
- The installation will be considered complete:
  - When the vendor demonstrates successful powering up of the instrument.
  - The vendor demonstrates various 2-port measurement modes of transmission and reflection.
  - The vendor demonstrates the software for acquiring and analysing the data
  - In addition to that it should satisfy the technical requirements provided in the following table when used along with the included calibration kit:

Parameters	Required Specifications
Frequency range	500 kHz to 12 GHz
Dynamic Range (> 1 GHz)	≥ 120 dB
Noise Floor	≤ -110 dBm @ 10 Hz IFBW
Power Range	Min power: ≤ -35 dBm Maximum power: ≥ 0 dBm
Power Accuracy (> 1 GHz)	±2 dB or better
Data points	>100,000
Impedance	50 ohms
Port and measurements	2 ports capable of performing S_{11}, S_{12}, S_{21} and S_{22} measurements
Maximum input power	$_+$20 dBm
Aging	<4 ppm/year

Frequency resolution (2.5GHz to 10GHz)	< 10 Hz
Frequency Reference Accuracy	±2 ppm or better
Directivity* (2-10 GHz)	>40 dB @ 10 Hz IFBW
Source match* (2-10 GHz)	>40 dB @ 10 Hz IFBW
Load match* (2-10 GHz)	>40 dB @ 10 Hz IFBW
Trace noise (2.5 GHz to 10 GHz)	Magnitude: <0.005 dBrms, Phase: <0.05-degree rms @ 1kHz IFBW
Transmission measurement uncertainty* (2.5-10 GHz, -50 to 0 dB)	< 0.2 dB / < 2° @ 10 Hz IFBW
Reflection measurement uncertainty* (2.5-10 GHz, at RC > 0.6)	< 0.03 dB /<3 ° @ 10Hz IFBW
Software and computer control/data acquisition	1. Computer interface for programmable control and data acquisition should be available via USB or GPIB or Ethernet. 2. The vendor should provide a plug and play software to acquire and analyse data from the VNA. 3. The vendor should also provide libraries and drivers for LabView, C++ and Python for use the instrument using custom programs.
Accessories	1. Adapters for SMA cables should be provided if needed 2. Two SMA-compatible cables must be provided,
Calibration kit	An electronic calibration kit must be included in the quote.

* : Performance achieved using the included calibration kit