भारतीय प्रौद्योगिकी संस्थान इंदौर
सिमरोल, खंडवा रोड, इंदौर, पिन- 453552

Indian Institute of Technology Indore
Simrol, Khandwa Road, Indore- 453552

GeM Bidding Document

For

Supply and Installation of
Electronic Workbench and Items

Document to be submitted online on GeM
for
(Technical & Financial Bid as per Schedule of requirement)

सहायक कुलसचिव
(सामग्री प्रबंधन विभाग)
Assistant Registrar
(Materials Management Section)

अनुभाग-1 /SECTION - I

विशेष नियम एवं शर्तें / SPECIAL TERMS AND CONDITIONS

1. **Any bidder from a country sharing a land order with India will be eligible to bid in this tender only if the bidder is registered with the Department for Promotion of Industry and Internal Trade (DPIIT) as per vide Ministry of finance OM No. 6/18/2019-PPD dated 23rd July 2020.**

2. **Benefits to Micro and Small (MSEs)/Start-Up will be applicable under PP Policy 2012 fro MSEs as per MSE guidelines issued by MoMSME.**

3. **The Public Procurement (Prefernce to Make in India) will be applicable under Order 2017, DIPP, MoCI Order no. P-45021/2/2017-B.E.II dated 15th June 2017 and its subsequent amendments.**

4. **Payment: No advance payment will be made in any case.** Payment will be released through wire transfer/bank RTGS transfer after Supply, installation testing, inspection& commissioning of the item(s) and if found satisfactory with regard to quality, quantity and specifications ordered. The payment will be released after statutory deductions within 30 days. For the payment, the firm has to submit Supplier's Invoice indicating, inter alia description and specification of the goods, quantity, unit price, total value; challans(s), Manufacturer's guarantee certificate; bank details/cancelled cheque, installation report, performance bank guarantee (if asked) etc. to the Assistant Registrar MM Section, IIT Indore.

a) In case of indigenous, the payment term may be

(i) 80% of the unit cost will be paid against delivery of the goods received in good conditions at IIT Indore and accepted by the user department.

(ii) 20% of the balance of each unit cost will be paid after satisfactory Installation, Commissioning, Testing & Training of the IIT employees and submission of performance bank guarantee.

5. **Performance Security:**
   a. Within fourteen days (or any other period mentioned in Tender Document or Contract) after the issue of Purchase Order by the Procuring Entity, the firm shall furnish to the IITI, performance security, valid up to **sixty days** after the date of completion of all contractual obligations by the contractor, including the warranty obligations.

   b. The 5% amount of the order vale shall be stipulated in Tender Document or Contract denominated in Indian Rupees or the currency of the contract and shall be in one of the following forms:
      I. Unless otherwise stipulated in Tender Document or Contract, Account Payee Demand Draft or Fixed Deposit Receipt or Banker's Cheque is drawn on any commercial bank in India, favoring the authority mentioned in therein (or FA&CAO of the Procuring Organization, if not mentioned).
      II. Bank Guarantee issued by a commercial bank in India, in the prescribed form provided in Format 1.3.

   c. If the contractor, having been called upon by the Procuring Entity to furnish Performance Security, fails to do so within the specified period, it shall be lawful for the Procuring Entity at its discretion to annul the award and enforce Bid Securing Declaration (in lieu of

forfeiture of the Bid Security), besides taking any other administrative punitive action like 'Removal from List of Registered Suppliers' etc.

6. **PREDISPATCH**- The firm should arrange the pre-dispatch inspection prior to packing & dispatching of the item if asked by the IIT Indore. The firm should share the entire details of the quoted items with original images, catalog and schematic diagrams before packing. Virtual/Online or physical inspection may be done by the IIT Indore technical committee.
7. Items should be delivered only on Working Days (Monday to Friday) during office Hours only i.e. between 10.00 am to 04.00 pm.
8. **PRE- INSTALLATION:** Please also mention the pre-installation requirements for the equipment like ambient temperature, humidity, civil work, weather specifications, power specifications, etc. When items are provided full performance satisfaction should be demonstrated.
9. **INSTALLATION & COMMISSIONING**: BIDDER shall be responsible for installation / demonstration wherever applicable and for after sales service during the warranty period and thereafter as mentioned in the contract. Installation demonstration to be arranged by the supplier free of cost and the same is to be done within 15 days of the arrival of the equipment at site. **For delayed in delivery or in satisfactory, installation, commissioning, testing & training the liquidated damages will be** imposed @ 0.5% (Half Percent) per week subject to a maximum of 10% of the total value of supply order & beyond 10% subject to approval of IIT Indore.
10. **Liquidated Damages: -**As Time is the essence of an order, the date of delivery should be strictly adhered to, otherwise the delivery in full or in part may not be accepted and penalty for late delivery will be imposed @ 0.5% (Half Percent) per week subject to a maximum of 10% of the total value of supply order & beyond 10% subject to approval of IIT Indore. In case of delay in satisfactory Installation Commissioning, Testing, Training, Inspection, Certification etc. also the same rate of penalty shall be leviable. Non- Delivery of material/service may lead to forfeiture of PBG and debarment of the supplier.
11. **Delivery: Free delivery at IIT Indore in case of indigenous orders**.
12. In case the equipment offered requires maintenance after the expiry of the warranty, please indicate the approximate cost of comprehensive and on-call basis maintenance and also the availability of local support or otherwise.
13. Please note clearly that the Bids sent through FAX, E-mail, by hand and/or by any post/courier shall not be accepted/ processed, in any case.
14. **All other General Terms & Conditions will as per GeM GTC 4.0 v1.12.**
15. **Format for Price Breakup (FORM-X) must be uploaded at the time of Price bid submission.**
16. All communications with respect to the tender shall be addressed to:

Assistant Registrar, MM Section
4th Floor, Abhinandan Bhawan (West Wing),
Indian Institute of Technology, Indore
Khandwa Road Simrol, Indore- 453552
Tel.: 0731-660 Ext 3369/3551/3408
Email: mms@iiti.ac.in

Assistant Registrar (MM)

सहायक कुलसचिव
(सामग्री प्रबंधन विभाग)
Assistant Registrar
(Materials Management Section)

अनुभाग-2 / SECTION- II

पूर्व योग्यता मानदंड/Pre- Qualification Criteria

भाग – 1 /PART - I

LIST OF DOCUMENTS TO BE UPLOADED WITH TECHNICAL BID

Sl. No.	Details	Supporting Document Should be Submitted
1.	The Bidder should be OEM/Authorized/Distributors/Dealers/Firms etc. and should have the existence of firm for a minimum period of 5 Years.	For OEM: - Valid Certificate of Incorporation/Registration Certificate of the firms.
2.	Bidder should submit a valid Manufacturers Authorization Form specific to this tender.	The authorization letter should be on the Letterhead of the concerned OEM. In case of Authorized/distributor/dealer/agent Copy of the valid authorization, the certificate shall be enclosed. **Offer submitted without proper authorization shall be liable to be rejected summarily.**
3.	The firm should have a strong technical support team available in India to rectify the technical issues related to the Electronic Workbench and Items supply within 24 Hrs.	Bidder should enclose the details of service support (Escalation Matrix details).
4.	**Udyam Certificate if bidder claim MSEs should be as per GeM_GTC Clause 04, Point no (xiii), m, (i)**	Self-certified copies of documents.
5.	**Startup Certificate if bidder claim as a startup**	Self-certified copies of documents.
6.	WORK EXPERIENCE: The Vendors / Bidders should have work experience as per the following parameters. Three similar completed work costing not less than Rs. 5,97,175/- in last 3 (Three) years for any Govt./Semi Govt./Centrally Funded Technical Institutes (CFTI) which includes IITs, IISERs, IIMs, NITs, IIITs, IISc and IIEST), CSIR Institutes, Central Universities and /or DAE Institutes (NISER, TIFR) where they have completed the similar works. OR Two similar completed work costing not less than Rs. 7,96,230/- in last 3 (Three) for any Govt./Semi Govt./Centrally Funded Technical Institutes (CFTI) which includes IITs, IISERs, IIMs, NITs, IIITs, IISc and IIEST), CSIR	Work orders and satisfactory completion valid certificates issued by respective buyer organization of the above order in support of experience to be enclosed. **Without submission of completion certificate the experience will not be considered.** **The valid certificate should be in Letter Head of the concerned government organization with authorized signatory.**

	Institutes, Central Universities and /or DAE Institutes (NISER, TIFR) where they have completed the similar works OR One similar completed work costing not less than Rs. 13,93,400/- in last 3 (Three) years for any Govt./Semi Govt./Centrally Funded Technical Institutes (CFTI) which includes IITs, IISERs, IIMs, NITs, IIITs, IISc and IIEST), CSIR Institutes, Central Universities and /or DAE Institutes (NISER, TIFR) where they have completed the similar works. **Note: Similar work means Supply & Installation of Electronic Workbench and Items.**	
7.	Bidder Information	**As per enclosed FORM - V**
8.	List of other Govt. Departments, Public Sector units and Central Autonomous Bodies for which the bidder is supplying material or having the similar type of contracts and a valid certificate regarding the satisfactory performance of the contract	**As per enclosed FORM VI**
9.	Bidder Acceptance of Tender Document	**As per enclosed FORM VII**
10.	The bidder should not have been blacklisted by any Government / Semi Government / Board /Corporations /Autonomous Body/ PSU. An undertaking/declaration in this regard should been closed. If any such matter i.e. of blacklisting /suspension is subjudice, even then the concerned firm shall be technically disqualified.	**As per enclosed FORM IV**
11.	The quoted products should not be under end of sales or end of support in next 05 (five) years from the date of submission.	(Declaration from OEM/ Authorized Distributors/Dealers/firms should be submitted)
12.	Make In India- Class-I or Class-II Local Supplier.	A Self-Declaration Certificate regarding "Class-I or Class-II Supplier" for the tendered item as per the Annexure- is to be submitted.
13.	**FINANCIAL TURNOVER:** The Bidder Annual Financial Turnover should more than Rs. **1 Crore** during the past three financial years namely 2019-20, 2020-21 and 2021-22. And In case of OEM, the Average Annual Turn Over of OEM should be Rs. **2 Crore** during the past three financial years namely 2020-21, 2021-22 and 2022-23. The Vendors / Bidders should not have incurred any loss during the last 3 (Three)	**As per enclosed FORM VIII** and Attach a separate neatly typed sheet on the letter head of Registered Chartered Accountant OR enclose copies of audited Balance Sheet and Profit & Loss Statement for the previous 3 financial year as specified in bid document and further details if required may be asked from the contractor after opening of technical bids. There is no need to upload entire voluminous balance sheet.

	years (as of 31st March, 2023). Profit after Tax should be positive for the above-mentioned period.	

Note: Non-Compliance with any of the above conditions by the bidders will amount to non-eligibility for which tender has been floated and its bid shall be liable to be rejected summarily.

Signature & Seal of Bidder

अनुभाग-2 / SECTION- II

तकनीकी विशिष्टता / Technical Specification

भाग – 2 /PART - II

(Bidder should submit compliance matrix along with Technical Bid)

Item details and technical specifications as mentioned below: Supply & Installation of Electronic Workbench and Items.

	Feature	Description/ Specification	Qty.	Compliance Yes/No	Deviation if any
1.	**ELECTRONIC WORKBENCH**	**ELECTRONIC WORKBENCH: -** An integrated workbench consisting of instrument panel and working table should suitable for students to learn and perform testing of Components. Instruments should internally electrically connect and should be fitted/on Bench in the panel such that only front panel and necessary interfaces are easily accessible to use. Structure of workbench should be made up of approx. 1.5 mm thick Stainless Steel pipes with top made up of good quality 18 mm thick plywood and covered with 1 mm of mica. Structure and design of Workbench should follow the below specifications: The basic structure should be made of 40mm x 40mm x 1.5 mm Stainless Steel pipes for sturdiness. The overall dimensions of Workbench should be not less than W = 1275 mm; D = 900 mm; H = 1625 mm. MS drawers 03 numbers W = 400 mm; D = 450 mm; H = 710 mm with caster wheel and thickness 1mm with handle & separate lock on each Drawer should be provided. Two Pole MCB to be provided for safety of Workbench. Workbench must have following testing and measuring instruments includes: **Digital Storage Oscilloscope** Number of Analog Channels: 2 Bandwidth: 100MHz Real Time Sampling: 1GS/s Each Channel (Simultaneously on both channels) or better Memory: 50Mpts Each Channel or better Waveform Capture Rate: More than 140,000 wfms/sec Vertical Sensitivity: 1mV/div to 20 V/div Vertical Resolution: 8 bits Time Base Range: 2 ns/div to 1000 s/div Coupling: AC-DC-GND Trigger: Edge, Slope, Pulse RS232,I2C,SPI Triggering Decode: Hardware	**03 Nos.**		

		Based Decoding RS232, I2C, SPI Math Function: A+B, A-B, A×B, A/B, FFT, Intg, Diff, Sqrt, Logical AND, OR, NOT, EXOR Built-in 6-bith frequency counter & Digital Voltmeter True RMS Display: 7" TFT , I/O Interface: USB Host & Device, LAN **Function Generator: (2 Channel 25MHz arbitrary waveform generator)** Sampling Rate 200MSa/Sec , Vertical Resolution 14bit , Memory 4kpt ,More than 4" TFT Display , Connectivity, Built-in 6 digit Frequency Counter 100mHz - 100MHz , Connectivity USB Device Waveforms: Sine, Square, Pulse, Ramp, Noise, DC, Arbitrary 20 built in waveforms like Sinc, Exponential, ECG etc. Modulation AM, FM, PM, FSK, Sweep Frequency Range: Sine Wave: 1µHz – 25MHz, Square Wave 1µHz – 15MHz, Pulse 1µHz – 15MHz , Ramp 1µHz – 400KHz , Arbitrary 1µHz – 10MHz Amplitude in to (50 Ohms)) < 10MHz 10mVpp to 10 V pp, < 30MHz 10mVpp to 5Vpp **Programmable DC Power Supply,** CH1 0-30V/0-5A, CH2 0-30V/0-5A, CH3 0-5V/0-3A, CH4 5V/2A (USB Output) Modes:CH1 & CH2: Series/Parallel Constant Voltage (CV), Constant Current (CC), 4.3 Inch TFT Display, Displays V, I , Power of 3 Channels simultaneously Resolution 10mV , 1mA Line Regulation: CV < 0.01% + 2mV Load Regulation CC < 0.01% +500µA Ripple CV <1mVrms, CC <3mArms Connectivity USB Host & Device , LAN **4 1/2 Digit Digital Multimeter** Power supply: 220V/ 110V AC Manual range Voltage measurement up to 1000VDC and 750V AC DC,AC current up to 20A ACV frequency response: 100kHz Frequency, Resistance, Capacitance measurement, Diode check and Continuity Test Connectivity USB Device **Soldering and De-Soldering Station** TECHNICAL SPECIFICATIONS . Input Voltage : 180-240VAC,50Hz Fuse : 3.15A . De-soldering: 24VAC,80W, Soldering:			

		24VAC,70W . Desold pump :24VDC, 80W Vacuum Pressure :12000 rpm, 500 to 600mm/hg . Temp Range : 180 to 480°C Temperature control accuracy +/- 1°C . Tip Leakage Current: < 2 mA Temperature Control Stability +/- 1°C . Tip to Ground Resistance: < 2 Ohms . Tip to Ground Leakage Voltage: < 2 mV Microprocessor based power control unit with built in vacuum pump. De-soldering iron & Soldering iron Stand with cleaning sponge & Cellulose tip cleaning sponge Power cord & Tool box : Fiber filters 20 Nos, solder collector glass tube 1No, Tip replace Spanner 1No,Cleaning **Suitable antistatic mat for Bench with wrest band** **Addon cut section for Trainer kit** Analysis of diode circuits (Clipping Circuits, Voltage Doublers, Rectified Differentiator, Precision Rectifier). SALIENT FEATURES Aesthetically designed injection molded electronic desk (Main unit) carrying useful experiment resources Variable Power supplies / Status / Pulsar / Function Generator, DPMs etc. while the central slot will carry replaceable experiment panel secured in an ABS molded plastic sturdy enclosure, & has colorful screw less overlay showing circuit & its connection tag numbers for easy connectivity. Connection through Sturdy 4mm Banana Sockets & Patch Cords. SPECIFICATIONS OF MAIN UNIT •Built in Power Supply : DC Supply :5V / 1A. & ± 12V, 1A. 0 to 15V DC (Variable), 100 mA (Isolated), 0 to 30V DC (Variable), 100 mA (Isolated High Volt DC 15V to 110V, 100Ma, AC Supply : 12-0-12V AC,150 mA. Short circuit Protected. •Built in Function Generator – O/p Waveform: Sine, Triangle & TTL O/Ps Output Frequency: 1 Hz to 1MHz in 6 ranges, with amplitude & frequency control pots. O/P Voltage 20Vp-p max. (Sin/TRG), Modulation I/P:AM : - I/P voltage + 5V (100% modulation) O/P - For 0V (min), + 5V (max.) - 5V (Phase reversal of O/P) FM : I/P voltage ± 400mV (+ 50% modulation) •Clock Generator: 10 MHz TTL clock. •Data Switches (10 No.) & bi-colour LED status indicators 10X2 Nos, for High / Low			

		indication. •Pulser switches (2 Nos.) with four debounced outputs - 2No. •BNC to 2 channel banana adapter - 2No. •Logic probe to detect High/Low level pulses upto 1MHz, with bi-colour LEDs to indicate status. •2 / 4 digit 7 segment display with BCD to 7 segment decoder. •Onboard DPMs provided with mode/range selection. DC volt : 2V/200V - 1No. DC current: 2mA/200mA - 1No. DC Volts/Current: 20V/200mA - 1No. •Onboard moving iron meters provided for AC Current: 1 AMP - 1No. AC Voltage: 15V - 1No. •Onboard speaker: 8 Ohms, 0.5 Watt (1No.) •Onboard POTS: 1K - 1No. 1M - 1No. •Operating Voltage: 220/240Vac switch settable ±10%, 50Hz/60VA. DC, AC & Wave Shaping Circuit Experiment Panel : DC : Resistance, current & voltage measurements, Loading of Potentiometer, Ohm's law, Power DC circuits, Series, parallel & mixed circuits, Kirchoff's law, Superposition theorem, Thevenin's & Norton's theorems, Reciprocity, Compensation, Tellegen, Millman theorems & Maximum Power transfer theorem, Voltage distribution of capacitors in series & parallel, total capacitance of capacitors in series & parallel, charging & discharging of capacitor through resistance & time constant, Wheatstone's Bridge, 2 Port Network Y, Z,h, ABCD Parameters & Star Delta Network, T & Pi attenuators. AC : AC Voltage & Current Measurements - R-L series, R-C series, R-L-C series circuit (Series Resonance). R - L parallel, R-C parallel, R-L-C parallel(Parallel Resonance), Active, Reactive power & power factor(Vector Diagram), average & RMS Value measurement. Wave Shaping: Differentiator, Integrator, Clipping, Clamping, Passive filters LC / RC, LPF/ HPF Rectifier, Filter, Zener Regulator Experiment Panel : Transformer & its study (Transformer DC/AC resistance, Transformation Ratio, Electromagnetic Induction, Loading of Transformer), Half wave rectifier, Full wave rectifier, Bridge rectifier, Filter, Voltage multiplier, Zener shunt regulator			
2.	**Microwave Optics Labs**	Microwave Optic System Microwave optics system consisting four metal arms having centimetre scale on it, to	**02 Nos.**		

		place object with specific distance. four component holder assemblies provided with setup to hold different type of plates and materials. A circular plate with degree scale is provided and use to connect one end of all arms which are able to freely rotate with respect to circular plate. By using this setup student can learn Concepts of Reflection, Refraction, Polarization, Diffraction, Interference, Standing waves , Interferometer etc. The setup should come along with following material such as Metal Reflectors (2Nos),Partial Reflectors (2Nos.), Polarizers (2Nos.), Slit Extender Arm, Narrow Slit Spacer, Wide Slit Spacer, Ethafoam Prism Mold, Detector probe, Polarization grille and Prism stand. The setup should consist one transmitting unit and also one receiving unit with following specifications. Input Line Voltage : 230V, AC ± 10%, 50Hz Frequency of operation:10GHz (approx.) Power of Transmission:10 -15mW Operating Voltage :8V (approx.) Antennas for Transmission & Reception : Horn type Goniometer scale:up to 360° Tone generator:1kHz Frequency Display: Digital, Relative Measurements The setup should be able to perform following experiments. • To Learn the Working of Transmitter and Receiver • To Learn the Standing Waves and Measure the Wavelength of Microwave To study the Reflection in Microwaves • To Learn the Polarization in Microwaves • To Learn the Fabry-Perot Interferometer • Study of Reflection			

		• Study of Refraction Through a Prism • Study of Double -Slit Interference • Study of Lloyd's mirror • Study of Michelson Interferometer • Study of Bragg Diffraction • Brewster's Angle			
3.	**4GHz Motorized Antenna**	**MOTORISED ANTENNA MEASUREMENT SYSTEM** **The Antenna Measurement System with 22 different Types of Antenna as listed** The Antenna Measurement with Data Acquisition System having the facility to be controlled, set parameters and acquire data from the system The Frequency of the RF Source should be PLL Synthesized and should generate 100MHz to 4 GHz The System should also be able to work in the Stand alone mode using Membrane Key pad and LCD Display with backlit and PC Control mode The Controller should be designed using ARM processor. The Transmitter and Motororized Receiver Stand should be made of special material which is inhert to EM frequency and should have engraved height and angle scale on it with spirit level at the base. Universal plug and fix Antenna mounts should be provided to hold the all types of antenna assembly in vertical and horizontal orientation for co and cross polarization. Stepper Motor provided with the system for rotation of Antenna should have minimum 2Kg torque and minimum Step Angle of 1.8 Degree and 5.4 Deegree The Source should have the facility to program the Frequency with a resolution of 1MHz The RF Detector should be a Logarithmic Detector with Frequency range of 100MHz to 8 GHz. The Radiation pattern of the Antenna under test should be plotted on the PC Screen in Cartesian and Polar Graph. Horizontal and Vertical Markers to be provided for measurements like Antenna Gain, FBR , Antenna Resolution, HPBW, BWFN The same system should be able to demonstrate and measure various parameters of the Wired Antenna, Micro strip Antenna, Aperture Antenna, Array Antenna	**04 Nos.**		

		and Reflector Antenna. **List of Standard 22 Antenna Supplied with the setup** **Wire Antenna** Monopole Plane base ground Dipole (2nos.) Folded Dipole Vee Dipole Rectangular Loop Helical Monopole- Wire Yagi Uda **Microstrip Antenna** Planar Dipole Planar Monopole CMSA TMSA 2X1 ARRAY Annular ring Chip Antenna RMSA- Circular Polarized Insert Feet **Aperture Antenna** E- Horn Open ended Waveguide Rectangular **Array Antenna** Broadside Array Collinear Array **Reflector Antenna** Parabolic Reflector\ **List of Deliverables:** **1. Antenna Source and Detector with Stepper Motor Controller 1 Nos.** **2. Antenna Transmitter and Motorized Receiver Stand 1 Nos** **3. Universal Mount, RF Cables and Accessories 1 sets** **4. Antenna Set consists of 30 antennae -1 Set** **5. Software for Radiation Pattern Measurement on CD – 1No** **6. Manuals- 1No** **7. Accessories – 1 Set**			
4.	**COMMUNICATION SYSTEM TRAINER**	**COMMUNICATION SYSTEM TRAINER** **SALIENT FEATURES** □ Can learn and experiment about variety of communication mediums (AM, FM, FO Wired) & methods (Modulation / Demodulation Analog/ Digital). □ Aesthetically designed injection molded electronic desk (unit) carrying useful experiment resources like power supplies, Multi Function generators,	**08 Nos.**		

		FM/AM/FO/Transmitter/receiver, MIC and L/S amplifier, Butterworth Filter (BWF), Sync sine waves etc while central slot will hold various replaceable experiment panels. □ Connection through sturdy 4mm Banana sockets, patch cords, ST connectors, BNC Connectors. □ Student workbook & instructor's Guide provided **SPECIFICATIONS OF UNIT** □ **Built in DC Power Supply :** 5V/1A, ± 12V/500mA, 0 to -15V DC (Variable) / 100mA, 0 to15V DC (Variable)/100mA. □ **Waveform Generator :** **1. Carrier Generator:** □ Waveform : SINE / TRG / TTL / CMOS (settable) □ Output Frequency : 1 Hz to 1 MHZ □ Output Voltage : 0-20 Vpp □ Controls : Frequency & Amplitude control pots □ Modulation : AM (std) -I/P volt - ±5V, 0V-No modulation AM (DSBSC)- I/P volt. 0-9.8 Vpp, o/p volt.0- 2.7, FM I/P volt. 400mV (±50% modulation), ASK- I/P upto 500Hz, ±5V Square wave, FSK-I/P upto 500Hz, ±4.5V Square wave. **2. Audio Oscillator:** □ Waveform : SINE / TRG / SQUARE □ Output Frequency : 50 Hz to 5KHz □ Output Voltage : Sine 0-2Vpp, Sq. 0-9 Vpp, TRG. 0-3Vpp □ Controls : Freq & Amplitude control pots. **3. Synchronized Sine Wave Generator :** □ Input : 32 KHz TTL I/P to Generate 4 nos. of sync. sine O/P			

		□ Waveform : SINE □ Output Frequency : 250 / 500 / 1000 / 2000 Hz □ Output Voltage : 0-10 Vpp □ Controls : Amplitude control pot □ Mic with Pre-Amp. Hand held Electret / dynamic microphone with preamplifier for audio range. □ Audio Amplifier : Variable Gain upto 20 for Audio range, Built in Loudspeaker - 8 ohm/500mW / earphone. □ Pink Noise Gen. : Frequency response of filter for audio range. □ Buffer/AC amplifier : NIV gain amplifier 2 Nos, Gain- 0-20, For Non sinusoidal Signal Generator cum INV buffer. □ BNC TO Banana Converter : Converts 1 BNC Socket to 2 Banana Sockets (4mm) & Vice Versa. □ Butter Worth Filter [LPF]: 4 Nos - 2 pole/4 pole butter worth filter cutoff freq 3.4 KHz Audio range. □ Pseudo Random Binary Sequence generator : Switch settable for on/off fix 15 bit PRBS Generator, will also function as input digital data stream generator. □ **Wireless Communication :** □ **1a. FM Transmitter (Transistorized) :** □ Carrier Tunable from 88 MHz to 108 MHz with built in FM [VCD] □ Modulating Signal : Amplitude - 5Vpp, Freq. - Audio Range □ Tx Power O/P : 50 to 100mW □ **1b. FM Receiver :** External 5 BS5 to connect to antenna, 2nd IF Input, 2nd IF Output, speaker & Audio amplifier, AM/FM Select switch, L/S impedance 8 ohm / 0.5 W. □ Controls (Manually) : Settable 88 to 108			

		MHZ □ Antenna / Transmission: Telescopic antenna [3 branch antenna]. □ **2a. AM Transmitter (Transistorized):** □ Carrier : 500KHz to 1.5MHz □ Modulating Signal: Amplitude - 5Vpp, Freq.- Audio Range. □ Tx Power Output : 50 to 100mW. □ **2b. AM Receiver :** External 5 BS5 to connect to antenna, 2nd IF Input, 2nd IF O/P, speaker & Audio amplifier, AM/FM Select switch, L/S impedance 8 ohm / 0.5 W. □ Controls (Manually) : Gain control settable from 0 to 4.5V. □ **3a. Fibre Optics Transmitter :** □ Data Input Bandwidth : 500KHz to 1.5MHz. □ Modulating Signal : Amplitude - 5Vpp, Freq.- Audio Range. □ Tx Power Output : 50 to 100mW. □ **3b. FO Receiver :** Detector (tr=8ms) separate BS5 socket for digital, AC coupled & TTL o/ps. □ Controls (Manually) : Transmitter bias control. □ Antenna / Transmission: 1m plastic fiber cable, CRT-1.492, NA- 0.5, λ– 660nm, step index, terminated with SMA connector.			
5.	**Satellite communicati on trainer**	**SATELLITE COMMUNICTION TRAINER** TECHNICAL SPECIFICATION *Satellite Uplink Transmitter* Frequency: 4 channel in 2.4 to 2.8 Ghz band; PLL controlled ISM band with 16x2 Backlit LCD display. 5/5.5 MHz audio and 8 MHz video FM modulation. Adjustable path loss knob to 35 dB. Transmission and reception with Helix, Dish Antenna is provided Detachable dish antenna with separate terminals for different inputs. Transmit three signals simultaneously at each	**03 Nos.**		

		up-linking frequency. RF output Z: 75Ω unbalanced Max bit rate: 500KHz typical FM Modulation of audio and video. In built power supply *Satellite Downlink receiver* Frequency: 4 channels in 2.4 to 2.8 Ghz band PLL controlled ISM band. Intermediate frequency 479.6 MHz (approx.) Various output terminals which are provided are Audio, Video, digital data up to 500 KHz, PC serial connector, Analog output, telecommand LED indication. Path loss: 20dB typical variable attenuation Audio 1out: Speaker inbuilt/output Video out: 5MHz bandwidth, 1V p/p Down-converter: 479.5 MHz output for spectrum analysis. Detachable Dish Antenna, Helix Antenna Receives and demodulate three signals simultaneously. Built in speaker for audio and video output. Terminal provided for PC Interface. In built power supply *Satellite Transponder* Transponder with selectable frequency conversion. Frequency: 4 channels in 2.4 to 2.8 Ghz band Microcontroller based Switch for selecting uplink frequency. Link Fail operation. RF input Z: 75Ω unbalanced Sensitivity: -85 dBm Uplink path loss: 20dB typical variable attenuation. Detachable dish Antennas. Radiated power 25 mW (Approx) with variable gain control. SMPS Based Power Supply : 220 V ± 10%, 50 Hz/ 60 Hz on request. Experiments that can be performed To set up an active & passive satellite communication link and study their difference. To measure the signal parameters in an analog FM/FDMTV Satellite link. To study the functionality of a satellite MODEM. To study the phenomenon of Linear and circular polarization. To measure the C/N ratio. To measure the S/N ratio. To study the effect of fading and measure the fading margin of a received signal. To measure the digital baseband signal parameters in a satcom link. To setup a RS-232 satellite communication link using com ports of PC.			

		To measure the propagation delay of signal. To measure path loss using spectrum analyzer. To study noise on spectrum analyzer Accessories The trainer provided with an interactive manual with complete details of theory and experimental procedure BNC to BNC cables Audio-Video Cable RS 232 interface Microphone Mains Cord, Dish Antenna, Helix Antenna TFT Monitor			
6.	**AM Modulation & Demodulation Trainer**	**AM modulation & demodulation Expt . panel** (Consisting of 3 Nos. modulators, Ceramic BPF, envelope - diode detector, product detector. Built in LPF for standalone application. □ Switched faults - 4 Nos. □ **Modulator:** Balanced modulator (DSB SC) - 2Nos. and DSB - TC -1 No., SSB - SC - 1No. □ **Demodulator:** Envelope detector-1 No., Product detector -1 No. □ Frequency division multiplexing with 2 Nos. of DSB-SC AM channels (Use P19 for demod of **FDM - AM**), 2p LPF for stand alone application. **List of experiments (12) :** DSB modulation with transmitted carrier (TC) / Crystal Oscillator, DSB modulation with suppressed carrier (SC), Ceramic filter (BPF), Crystal Oscillator, SSB SC modulation (for upper/lower side band), DSB TC demodulation, DSB SC demodulation, SSB SC demodulation, ASK Demodulation using synchronous detector, Voice communication, Switched faults.	**09 Nos.**		
7.	**FM Modulation & Demodulation Trainer**	**FM Modulation & Demodulation** □ Switched faults: - 8 Nos. □ **Modulator**: (With center freq. 455 KHz). Reactance Modulator, Varactor Modulator with center frequency adjustment, Phase	**09 Nos.**		

		modulator using varactor, Armstrong Modulator using PLL. □ **Demodulator:** Detuned resonant circuit detector, Quadrature detector, Foster-Seeley discriminators, Ratio detector, P h a s e - l o c k e d l o o p detector & determination of capture and lock range, Phase Demodulator using quadrature detector. 2P LPF for standalone application. □ Pre-emphasis & De-emphasis Block for flat frequency response. **List of experiments (12) : Frequency modulation using :** R e a c t a n c e modulator, Varactor modulator, **Phase modulator** using varactor, Frequency demodulation using : Detuned resonant detector, Foster Seeley/ratio detector, Study of PLL capture & lock range & its use as FM detector, Use of PLL as Armstrong Modulator, Quadrature detector, Phase demodulation using quadrature detector, Introduction of noise & its effects on frequency modulation, Voice communication, **pre-emphasis & deemphasis** for flat frequency response, Switched faults			
8.	**Carrier modulation/ Demodulation Expt. Panel**	**Carrier modulation/ Demodulation Expt. Panel** □ **Carrier Sine wave**-500KHz, 250KHz(0° phase) & 250KHz(90° phase) with settable amplitude 0 to 2Vpp. □ 4 MHz Crystal Stabilized Clock. □ **On board Unipolar to Bi polar Converter, Data Squaring.** □ **Carrier Modulation Techniques** ASK, FSK, PSK & QPSK. □ **Carrier De-Modulation Techniques** ASK (Rectifier Detector), FSK (Phase Lock Loop Detector), PSK (Squaring loop Detector) and QPSK (Fourth power loop detector). □ **Low Pass Filter** 2 Nos with Cut off Frequency 340KHz. **List of experiments (4) :** Amplitude Shift Keying [ASK] Modulation / Demodulation, Frequency Shift Keying [FSK] Modulation / Demodulation, Phase Shift Keying [PSK] Modulation / Demodulation, Quadrature	**09 Nos.**		

		Phase Shift Keying [QPSK] Modulation / Demodulation			

Note:

A. **The bidder should submit his acceptance against each column as YES/NO and if No, the bidder should specify the deviation.**
B. **Valid proof of the document in support of the claim to be enclosed with the technical bid.**
C. **The Quantity mentioned above is also indicative and might change in the final order.**
D. **Prospective bidders can quote Rate as per Unit and the institute will decide on the final order quantity.**
E. **OEM Packing: The OEM sealed packing of materials. If seal is broken the Item will be rejected.**

(Signature of the Bidder, with Official Seal)

अनुभाग-2 / SECTION- II

अमूल्यंकित तकनीकी बोली / UNPRICED TECHNICAL BID

भाग – 3 /PART - III

(Bidder should provide the following details on Letter head)

TENDER NO.: Date:

Name of the Bidder _____

Sr. No.	Item Description	Quantity	Make	Model	HSN Code	GST %	Country of Origin
1							
2							
3							
n							

Other Terms & Conditions

1.	Payment terms	:
2.	Delivery Period from the date of Purchase Order	:
3.	Installation within 15 days of delivery	:
4.	Warranty	:
5.	Specify any other terms & conditions:	:

प्रपत्र -1 / FORM-I

निर्माता का अनुज्ञा और वारंटी समर्थन पत्र

MANUFACTURER'S AUTHORIZATION & WARRANTY SUPPORT DECLARATION
(ON OEMs Letter head)

Date: _____

Tender No / GeM bid no:

To
The Registrar
Indian Institute of Technology Indore

We,_____ [name of Manufacturer], who are official manufacturers of [Insert type of goods manufactured] having factories at [insert full address of Manufacturer's factories], do hereby authorize [insert complete name of Bidder] to submit a bid the purpose of which is to provide the following goods, manufactured by us [insert name and or brief description of the goods], and to subsequently negotiate and sign the contract.

We hereby extend our full guarantee, warranty, availability of spare parts and AMC support in accordance with the Terms and Conditions of Contract with respect to the Goods offered by the above firm.

Authorized representative of the Manufacturer	Authorized representative Bidder
Signature:	Signature:
Name:	Name:
Address:	Address:
Mobile No:	Mobile No:
Email ID:	Email ID:

प्रपत्र -2 / FORM-II

स्थानीय सामग्री के लिए घोषणा

Declaration for Local Content (on OEM's Letter Head)

(To be given on Company Letter Head - For tender value below Rs.10 Crores)
(To be given by Statutory Auditor/Cost Auditor/Cost Accountant/CA for tender value above Rs.10 Crores)

Date: _____

To
The Registrar
Indian Institute of Technology Indore

Sub: Declaration of Local content

Tender No: _____

Name of Goods & Services : -
_____

1. Country of Origin of Goods being offered: _____

2. We hereby declare that items offered has ____% local content **(Please provide exact %)**.

3. Details of location at which local value addition will be made / made: (Complete address to be mentioned)
_____
_____

"Local Content" means the amount of value added in India which shall, be the total value of the item being offered minus the value of the imported content in the item (including all customs duties) as a proportion of the total value, in percent.

"*False declaration will be in breach of Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law."

Yours Faithfully,
(Signature of the Bidder/OEM, with Official Seal)

प्रपत्र -3 / FORM-III

डीपीआईआईटी पंजीकरण के लिए घोषणा पत्र

Declaration for DPIIT Registration (on OEM's Letter Head)

CERTIFICATE BY BIDDER- DPIIT REGISTRATION

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this bidder is not from such a country or, / if from such a county, has been registered with the Competent Authority (copy of the Registration Certificate enclosed).

I hereby certify that his bidder fulfils all requirements in this regard and is eligible to be considered.

Signature with Date and Stamp

Of the Bidder

प्रपत्र -4 / FORM-IV

स्वच्छ छवि/कोई कानूनी कार्रवाई नहीं होने के संबंध में घोषणा पत्र

DECLARATION REGARDING CLEAN TRACK/NO LEGAL ACTION

(to be provided on letter head of the firm)

I hereby certify that the above firm namely _____ is neither blacklisted by any Central/State Government/Public Undertaking/Institute nor any criminal case registered / pending against the firm or its owner/ partners anywhere in India preceding three years from the date of publishing of tender.

I also certify that the above information is true and correct in any every respect and in any case at a later date it is found that any details provided above are incorrect, any contract given to the above firm may be summarily terminated and the firm blacklisted.

Date:

Authorized Signatory

Name:

Place:

Designation:

Contact No.:

प्रपत्र -5 / FORM-V

बोलीदाता सूचना प्रपत्र

BIDDER INFORMATION FORM

	Company Name	
	Registration Number	
	Manufacturer /Distributor for the quoted product	
	Registered Address	
	Name of Partners /Director	
	City /Postal Code	
	Company's Establishment Year	
	Company's Legal Status (tick on appropriate option)	1) Limited Company 2) Undertaking 3) Joint Venture 4) Partnership 5) Others (In case of Others please specify)
	Company Category	1) Micro Unit as per MSME 2) Small Unit as per MSME 3) Medium Unit as per MSME 4) Ancillary Unit 5) SSI 6) Others (In case of Others please specify)
	Contact Name Email Id MOBILE NO.	
	BANK DETAILS	Name of Beneficiary : A/c. No. CC/CD/SB/OD: Name of Bank : IFSC NO. (Bank) : Branch Address and Branch Code:
	Vendor's PAN No. (Should be attached)	
	Vendor's GST No. (Should be attached)	

प्रपत्र -6 / FORM-VI

पिछली आपूर्ति आदेश सूची प्रारूप

PREVIOUS SUPPLY ORDER LIST FORMAT

Order placed by *{Full address of Purchaser]*	Order No. and Date	Description and quantity of ordered equipment	Value of order	Contact Person along with Telephone no., Fax no. and e-mail address.

Note: Technical Committee may seek additional information from the existing users at IIT Indore or from other Institutes, these feedbacks will be considered for technical evaluation.

Signature and Seal of the Manufacturer/ bidder .....

Place:

Date:

प्रपत्र -7 / FORM-VII

निविदा शर्तों की स्वीकृति हेतु
ACCEPTANCE OF TENDER TERMS

(To be given on Company Letter Head)
Date: DD/MM/YYYY

To,
The Registrar
Indian Institute of Technology Indore

Sub: Acceptance of Terms & Conditions of Tender. _____"

Dear Sir,

1. I/ We have downloaded / obtained the tender document(s) for the above mentioned 'Tender/Work' from the web site(s) namely: _____as per your advertisement, given in the above mentioned website(s).

2. I / We hereby certify that I / we have read the entire terms and conditions of the tender documents from Page No. _____ to _____ (including all documents like annexure(s), schedule(s), etc), which form part of the contract agreement and I / we shall abide hereby by the terms / conditions / clauses contained therein and I have no objection for any of the content of the bid document. The rates quoted by me/us are valid and binding on me/us for acceptance till the validity of bid.

3. I / We hereby unconditionally accept the tender conditions of above-mentioned tender document(s) / corrigendum(s) in its totality / entirety.

4. I / We do hereby declare that our Firm has not been blacklisted/ debarred by any Govt. Department/Public sector undertaking.

5. I / We do hereby declare that we have quoted our firm rates inclusive of taxes if not mentioned extra.

6. I/We agree to hold this offer open until **180 days** and shall be bound to supply/commission/install/test the equipment and dispatch the same within the specified period.

7. **I/We agree that in case if we fail to deliver the goods/complete the work/supply within the stipulated time, then institute has full power to compound the liquidity damages or forfeit the Bid Security/Security Deposit or any necessary action as deemed fit can be taken by the IIT Indore.**

8. The articles shall be of the best quality and of the kind as per the requirement of the institution. The decision of the IIT Indore, India (herein after called the said officer) as regard to the quality and kind of article shall be final and binding on me. Should the said officer deem it necessary to change any article on being found of inferior quality, it shall be replaced by me/us free of cost in time to prevent inconvenience.

9. I/We declare that no legal/financial irregularities are pending against the proprietor/partner of the biding firm or manufacturer.

10. I/We undertake that the items supplied are as per Demonstration/Catalogue/technical literature description.

11. I/We undertake that the quoted rates are not higher than that approved in any other Govt. institutions in India for the same items during the current Financial Year.

12. I/we do hereby confirm that the prices/rates quoted are fixed and are at par with the prices quoted by me/us to any other Govt. of State/Central//Institute/Department/PSUs. I/we also offer to supply the Equipment/stores at the prices and rates not exceeding those mentioned in the price bid.

13. I/We do hereby confirm that I/we aware about the provisions of "Make in India"/startup initiatives and directives regarding Price Preference Policy to Make in India Registered Bidders and I/We undertake for following the same as per directions of IIT Indore in respect of this E-Bid Enquiry.

14. I/we have necessary infrastructure for the maintenance of the equipment and will provide all accessories/spares as and when required.

15. I/we also declare that in case of change of Indian Agent or for any other change. Merger, dissolution solvency etc. in the organization of our foreign principles, we would take care of the Guarantee/Warranty/Maintenance of the machinery/equipment and have provided written confirmation for the same.

16. I/we undertake to get the equipment repaired/replace within 48 hours of the receiving of the complaint from the institute failing which a penalty of @ 1% of the cost may be recovered from the Bank Guarantee before releasing the same to us after completion period.

17. I/we undertake, If as a result of post payment audit any over payment is deducted in respect of any Supply/work done by our Agency or alleged to have been done by our Agency under this bid, it shall be recovered by the IIT Indore from our Agency.

18. I/we undertake, If any under payment is discovered, the amount shall be duly paid to our Agency by the IIT Indore.

19. I/we undertake that we shall liable to provide all the relevant records copies during the concurrency period of Contract or otherwise even after the Contract is over, whenever required by IIT Indore.

Yours Faithfully,

(Signature of the Bidder, with Official Seal)

प्रपत्र -8 / FORM-VIII

वार्षिक कारोबार की घोषणा और

इनकम टैक्स रिटर्न

DECLARATION OF ANNUAL TURNOVER AND INCOME TAX RETURN

(To be submitted on Firm/Company Letterhead)

To, Date :
The Registrar
Indian Institute of Technology Indore

Sub: NIT No. _____

Dear Sir,

I/we hereby declare that, our firm's Annual Turnover as follows, and I/we have also
supported an Audited Accounts for your references:

F.Y 2020-21	F.Y 2021-22	F.Y 2022-23

And,

I/we hereby declare that, our firm had filed Income Tax Returns for last 3 years i.e. F.Y. 2020-21, 2021-22, & F.Y. 2022-23. Supported by copy of ITR of three years.

_____
(Signature of the Tenderer)
Company Seal:
Date:

प्रपत्र -9 / FORM-IX

परफॉरमेंस सिक्योरिटी प्रारूप

PERFORMANCE SECURITY FORMAT

To,

.....

WHEREAS ..... (name and address of the supplier) (hereinafter called "the supplier") has undertaken, in pursuance of contract no. ..... Dated .....to supply (description of goods and services) (hereinafter called "the contract").

AND WHEREAS it has been stipulated by you in the said contract that the supplier shall furnish you with a bank guarantee by a scheduled commercial bank recognized by you for the sum specified therein as security for compliance with its obligations in accordance with the contract;

AND WHEREAS we have agreed to give the supplier such a bank guarantee:

NOW THEREFORE we hereby affirm that we are guarantors and responsible to you, on behalf of the supplier, up to a total of ..... (amount of the guarantee in words and figures), and we undertake to pay you, upon your first written demand declaring the supplier to be in default under the contract and without cavil or argument, any sum or sums within the limits of (amount of guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

We further undertake to pay the Purchaser any money so demanded notwithstanding any dispute or disputes raised by the supplier(s)/vendor(s) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the supplier(s)/vendor(s) shall have no claim against us for making such payment.

We hereby waive the necessity of your demanding the said debt from the supplier before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the contract to be performed there under or of any of the contract documents which may be made between you and the supplier shall in any way release us from any liability under this guarantee and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until the ..... day of ....., 20.....

(Signature of the authorized officer of the Bank)

Name and designation of the officer
Seal:
Name & address of the Bank
Address of the Branch:
Phone No.:
E-mail ID:.

प्रपत्र -10 / FORM-X

Format for Price Breakup/Financial Document
for
Supply and Installation of Electronic Workbench and Items

Name of the Bidder/ Bidding Firm / Company: _____

Sr. No.	Item	Qty.	Unit Price in INR (₹)	GST in INR (₹)	Total Price in INR (₹)
1.	ELECTRONIC WORKBENCH	03 Nos.			
2.	Microwave Optics Labs	02 Nos.			
3.	4GHz Motorized Antenna	04 Nos.			
4.	COMMUNICATION SYSTEM TRAINER	08 Nos.			
5.	Satellite communication trainer	03 Nos.			
6.	AM Modulation & Demodulation Trainer	09 Nos.			
7.	FM Modulation & Demodulation Trainer	09 Nos.			
8.	Carrier modulation/ Demodulation Expt. Panel	09 Nos.			

Note:
1. All Terms & Conditions will be as per NIT Document uploaded on GeM.
2. Format for Price Breakup (FORM-X) must be uploaded at the time of Price bid submission.

(Signature of the Tenderer)

Company Seal
Date: