

NOTICE INVITING TENDERS

**FOR THE SUPPLY AND INSTALLATION OF LABORATORY COMPONENTS FOR
ELECTRONICS AND COMMUNICATION ENGINEERING DEPARTMENT AT IIIT
TIRUCHIRAPPALLI CAMPUS, SETHURAPATTI, TIRUCHIRAPPALLI**



Indian Institute Information Technology Tiruchirappalli,
Sethurapatti, Trichy-Madurai Highway,
Tiruchirappalli-620012,
Tamil Nadu.

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Contents:

DESCRIPTION	PAGE NO.
Advertisement	3
Time schedule	4
Clarifications	5
Bid	6
Statement related to bids	7
Tender schedule	8
Eligibility criteria	9
Method of submission of bids	12
Evaluation of bids	13
Opening of Financial Bid and Evaluation	13
Technical bid	15
Check list	18
Declaration	19
Bid Security declaration Form	20
Fall Clause Notice Certificate	21
Specification and Sample Images for laboratory equipment	22
Schedule of Quantity	41
Compliance Statement	42
Financial bid	43
Address slip	45

Advertisement

Ref. No: IIIT/ECE/Laboratory/2024/09-01



IIIT Tiruchirappalli, Tamil Nadu

Ref. No.: IIIT/ECE/Laboratory/2024/09-01

Open Tenders are hereby invited from reputed Registered Firms/Agencies/Vendors/Suppliers for providing the following items at IIIT Tiruchirappalli, Sethurapatti, Trichy-Madurai Highway, Tiruchirappalli – 620012, Tamil Nadu.

“Tender for the Supply and Installation of Digital Communication Laboratory Components for Electronics and Communication Engineering Department at IIIT Tiruchirappalli”

Tender Schedules can be downloaded from IIIT Tiruchirappalli website from 13/09/2024. Along with tenderschedule, bidders need to submit signed relevant documents in hard copies.

The last date for submission of tenders is 04/10/2024.

For further details regarding Tender notification & specifications, please visit: www.iiitt.ac.in

Date: 13/09/2024

**Director
IIIT Tiruchirappalli**

Time Schedule of various tender related events

**(FOR THE SUPPLY AND INSTALLATION OF DIGITAL COMMUNICATION
LABORATORY COMPONENTS FOR ELECTRONICS AND COMMUNICATION
ENGINEERING DEPARTMENT AT IIT TIRUCHIRAPPALLI CAMPUS, TAMIL NADU)**

Bid document downloading Start Date	13/09/2024
Pre-bid meeting based on queries of Bidders/Tenderers	18/09/2024
Bid document downloading End Date	04/10/2024
Last Date and Time for the receipt of Bids	04/10/2024, 3.00 PM
Technical Bid OpeningDate	07/10/2024
Financial Bid OpeningDate	Will be intimated later
Contact Person	The Registrar (i/c), IIT Tiruchirappalli, Tiruchirappalli
Reference No:	IIITT/ECE/Laboratory/2024/09-01

CLARIFICATIONS

Queries, if any, can be made through e-mail only to registrar@iiitt.ac.in on or before 27/09/2024. Queries received via any mode other than e-mail id mentioned above will not be entertained. The queries should only be sent in the following format on the official letter head of the company.

S. No.	Page No. (Tender Ref.)	Clause (Tender Ref.)	Description (Tender Ref.)	Query

If there is any addendum/corrigendum related to tender, it shall only be published on IIIT Tiruchirappalli website (www.iiitt.ac.in). The Bidders are advised to check IIIT Tiruchirappalli website regularly. No other mode of notice will be given.

The Bidders are requested to submit the bids after issue of clarifications duly considering the changes made, if any. Bidders are totally responsible for incorporating/complying with the changes/amendments issued in their bid, during pre-bid meeting.

If the last date of receiving/opening of the bids coincides with a holiday, then the next working day shall be the receiving/opening date of the bids.

The Technical Bid along with relevant signed documents should be attached with original EMD. Physical submission of financial bid only shall be considered.

Sd/

**REGISTRAR (i/c)
IIIT TIRUCHIRAPPALLI**

BID

Ref. No. : IIITT/ECE/Laboratory/2024/09-01

Dated: 13/09/2024

Subject: Tender for the Supply and Installation of Digital Communication Laboratory Components for Electronics and Communication Engineering Department at IIT Tiruchirappalli.

Sir/Madam,

Bids are invited on the Open Tender platform from the reputed Registered and experienced Firms/Agencies/Bidders/Suppliers. The details of bidding conditions and other terms can be downloaded from IIT Tiruchirappalli Website: <http://www.iiitt.ac.in/> .

The attested copies of all the documents of Technical bid, signed undertaking of Bidder should be submitted offline mode only to **The Director, IIT Tiruchirappalli, Tamil Nadu.**

The participating Bidder/s will have to pay EMD for the amounts specified in the Statement related to bids, in the form of Demand Draft drawn from any Nationalized Bank, in favour of The Director, IIT Tiruchirappalli, Tiruchirappalli.

Further, the Successful Bidder shall furnish a part of the bid as Performance Guarantee specified in the Statement related to bids, to be paid in the form of Bank Guarantee as mentioned in the Tender Schedule.

IIT Tiruchirappalli, Tamil Nadu will not accept tenders from blacklisted companies or undependable suppliers, whose past performance with IIT Tiruchirappalli was found poor due to delayed and/or erratic supplies and those with frequent product failures, and also against whom there have been adverse reports of sub-standard quality/poor services, as defined in the other parts of the bidding documents.

STATEMENT RELATED TO BIDS

EMD	<p>Rs. 30,000/- by way of DD from any Nationalized bank drawn in favor of The Director, IIT Tiruchirappalli, Payable at Tiruchirappalli.</p> <p>The EMD or Performance guarantee will bear no interest whatsoever. A copy of the payment receipt should be enclosed along with the Technical bid of tender document.</p> <p>EMD exemption is applicable to bidders as per norms of Govt. of India, (GFR).</p>
Bid Validity Period	90 days from the date of opening of Financial bid
EMD Validity Period	90 days from the date of opening of Financial bid
Period of furnishing Performance Guarantee	Within 7 days from date of receipt of LOA
Performance Guarantee Value	3% on the work order value (in the form of BG)
Performance Guarantee Validity period	26 months from the date of commencement of services
Period for signing the Order of Acceptance	Within 14 days from date of receipt of LOA

TENDER SCHEDULE

PREMEABLE:

Indian Institute of Information Technology Tiruchirappalli is the one among the chain of IITs started by the Government of India. IIT Tiruchirappalli was established in the state of Tamil Nadu in the academic year 2013 – 2014.

IIT Tiruchirappalli, Tamil Nadu invites tenders from reputed agencies / companies (no brokers, intermediaries or aggregators) to purchase Laboratory equipment as per the requirements of IIT Tiruchirappalli, Tamil Nadu based on the eligibility criteria and general terms and conditions mentioned in this document.

PERIOD OF WARRANTY:

The warranty for the purchased laboratory equipment shall be for a period of atleast two **(02) years**.

1. Separate warranty / validity certificate should be produced along with the invoice for release of payment. The supplied product of Laboratory equipment should be produced along with the invoice for release of payment.
2. The warranty start and end date will be counted from the product delivered date and not from the date of shipment/ billing.
3. Comprehensive on-site warranty with on-site support and service for both parts and labours mean that your labours should visit the site / location where the problem is reported, identify the problem and replace the faulty parts. IITTT will not provide or do any troubleshoot at our end.

SCOPE OF WORK

The Supply and Installation of Digital Communication Laboratory Components for Electronics and Communication Engineering Department at IIT Tiruchirappalli

Name and Signature of the bidder with seal

ELIGIBILITY CRITERIA

An Agency/ Firm having an experience of at least three (3) years of supplying and installing laboratory equipments or similar items in any educational institutions /autonomous bodies etc. is eligible to apply. The firm shall have requisite registration certificate for dealing with laboratory equipments.

TERMS AND CONDITIONS

The tenderer submitting the tender document for the supply and installation of Digital Communication Laboratory Components should comply with the following terms and conditions.

1. The purchase order will be awarded based on lowest charges (L-1).
2. Tenders shall be submitted in official tender form only. If submitted in any other form the same shall be summarily rejected. No tenderer shall be issued more than one tender form.
3. Tenders received without prescribed Earnest Money Deposit (EMD) shall not be considered.
4. The schedules issued with the form of tender listing the services to be rendered must not be altered by the tenderer. Any modifications/alterations of the schedules considered necessary by the tenderer should be in the separate letter accompanying the tender.
5. No paper shall be detached from the tender.
6. The name and address of the tenderer shall be clearly written in the space provided and no overwriting corrections, insertion shall be permitted in any part of the tender. The tender form should be filled in and submitted in strict accordance with the instructions laid down herein otherwise the tender is liable to be ignored.
7. The tender is liable to be ignored if complete information is not given therein or if the particulars and date (if any) asked for in the Schedule to the tender are not filled in.
8. Each bidder shall submit only one bid. If a bidder or if any of the partners in a joint venture or any one of the members of the consortium participate in more than one bid, the bids (of both the individual and the partnership/consortium/joint venture) are liable to be rejected.
9. The bidder shall bear all costs associated with the preparation and submission of his/her bid and IITT shall in no case be responsible or liable for those costs, regardless of the conduct or outcome of the tender process.
10. IITT will respond to any request for clarification or modification of the Tender Documents that are received up to TWO DAYS prior to the deadline for submission of bids prescribed by IITT. For this purpose, the prospective bidder(s) requiring clarification in the Tender Document shall notify IITT through Email ONLY. Any such clarification, together with all details on which the clarification had been sought, will be published in the institute website only.
11. Individual signing the tender or other documents connected with the tender must specify whether he/she signs as:
 - (i) A sole proprietor of the concern or constituted attorney of such sole proprietor.

- (ii) A partner of the firm if it is a partnership firm, in that case he must have authority to execute contracts on behalf of the firm and refer to arbitration disputes concerning the business of the partnership either by virtue of partnership agreement or by a power of attorney duly executed by the partners of the firms.
 - (iii) Director or Principal Officer duly authorized by the Board of Directors of the company.
 - (iv) In case of (ii) a copy of the partnership agreement or general power of Attorney, in either case attested by a Notary Public should be furnished or an affidavit on stamp paper duly sworn or affirmed by all the partners admitting execution of the partnership agreement or the general power of attorney should be furnished. The attested copy of the certificate or registration of firm should be attached along with the tender papers. In case of partnership firm, where no authority to refer dispute concerning the business of the partnership has been conferred on any partner, the tender and all other related documents must be signed by all the partners of the firm. In case of (iii) the person signing the tender should be authorized by a resolution passed by the board of directors and a copy of the resolution attested by the Principal Officer should be attached.
12. A demand draft of Rs. 30,000/- (Rupees Thirty Thousand only) is required to be deposited as an Earnest Money Deposit in favour of "The Director, IIT Tiruchirappalli ". The Earnest Money Deposit (EMD) of the successful tender shall be liable to be forfeited if he/she does not fulfill any of the following conditions.
- (i) An agreement is signed by him/her in the prescribed form after the receipt of the letter awarding the contract.
 - (ii) Maintenance of the purchased items until the warranty period.
13. The bids should be valid in the case of all the tenders for at least three (3) months from the date of opening of the tender and if any tenderers withdraw or alters the terms of the tender during the period, the Earnest Money Deposit shall be forfeited. In the case of the successful tenderer, rates quoted shall be valid for the entire period of the contract.
14. Late tenders will not be considered as per GFR.
15. IIT Tiruchirappalli reserves the right to accept or reject any or all the offers either fully or partly without assigning any reasons.
16. Tender shall be accompanied by the copy of relevant documents including the following:
- (i) Certificate in support of experience for having undertaken this kind of business along with a list of organizations where the Vendor is currently providing / has provided items.
 - (ii) PAN Card
 - (iii) Certificate of incorporation in case of a Company/ Partnership deed in case of partnership/certificate of registration in case of Sole Proprietorship
 - (iv) GST Registration Certificate
 - (v) All necessary documents required for the fulfillment of the Eligibility Criteria including proof of supply and installation of laboratory components mandated in the tender document.
17. The L-1 vendor shall deposit 3% of the total tender amount as Security Deposit with IITT. No interest shall accrue on this deposit, which will be returned after the successful completion of contract and after

adjusting dues if any, of the vendor to IITT. The EMD of successful tender will be converted as security deposit and the EMD of unsuccessful tenders will be refunded.

18. The vendor should show a sample of each item if he/she is awarded the purchase order.
19. **Liquidated Damages:** If a firm accepts an order and fails to execute the order, in full or part, as per terms and conditions, stipulated therein, it will be open to the Institute **to recover liquidated damages from the firm at the rate of 0.5% of the value of the undelivered goods per month or part thereof, subject to a maximum of 5% of the value of the undelivered goods.** It will also be open to the Institute alternatively, to arrange procurement of the required stores from any source, at the risk and expense of the firm, accepted and failed to execute the order according to stipulations agreed upon. This will also entail removal of the defaulters' name from the approved/registered list of Suppliers.
20. Payment and receipts to Government and Semi Government Agencies would be rounded off to the nearer higher rupee and in other cases the rounding off will be to nearest, i.e. paise 50 or above will be rounded off the near higher rupee and paise less than 50 will be ignored.
21. Canvassing or offer of an advantage or any other inducement by any person with a view to influencing acceptance of a bid is an offence under Laws of India. Such action will result in the rejection of bid, in addition to other punitive measures.
22. All rules will be governed by Govt. of India, General Financial Rules 2017 and bidders are requested to make themselves aware of the same.

Name and Signature of bidder with seal

METHOD OF SUBMISSION OF BIDS

- The Bid documents can be downloaded from Institute website <http://www.iiit.ac.in/main/tender>.
- The bids should be filled in two bid formats with all the required documents as enclosures in separate sealed covers i.e., (a) Part-I Technical bid, (b) Part-II Financial bid
Two separate sealed covers should be specifically super-scribed as (a) **“Technical bid for the supply and installation of Digital Communication Laboratory Components for Electronics and Communication Engineering department at IIT Tiruchirappalli, Tamil Nadu** and (b) **“Financial bid for the supply and installation of Digital Communication Laboratory Components for Electronics and Communication Engineering department at IIT Tiruchirappalli, Tamil Nadu**. Both the sealed envelopes (a) and (b) are to be kept in another Master envelope, which should also be sealed and submitted.
- The Master envelope should be super-scribed with **“Tender for the supply and installation of Digital Communication Laboratory Components for Electronics and Communication Engineering department at IIT Tiruchirappalli, Tamil Nadu”** and shall be addressed to “The Tender Box, C/o The Director, Indian Institute of Information Technology Tiruchirappalli, Trichy- Madurai highway, Sethurapatti, Tamil Nadu -620012”.
- The Bidders must submit signed hardcopies of all relevant documentary proofs for the tender.
- **Last date for submission of bid documents is 04/10/2024.**
- Bids received after the due date and time shall be summarily rejected.
- Incomplete bids or bids submitted not in prescribed format are liable for rejection.
- Institute will not be responsible for **postal delay**

EVALUATION OF THE BIDS

1. The tender box shall be opened in the presence of Bidders, who may like to be present on technical bid opening in **IIIT Tiruchirappalli**, Tamil Nadu-620012.
2. The Technical bid should consist of all the details as specified in the schedules along with commercial terms and conditions. There should be no cost indication in the Technical bid.
3. A Committee duly constituted by the Competent Authority would evaluate the Technical bids submitted by the Bidders.
4. At first, bidders are expected to meet the Pre-requisite eligibility criteria. Bidders failing to meet these criteria or not submitting requisite supporting documents / documentary evidence for supporting the eligibility criteria, are liable to be rejected summarily. If any document produced in support of the eligibility criteria turns out not to be genuine, the EMD/Security Deposit stands automatically forfeited, whether before award of purchase order.

OPENING OF FINANCIAL BID AND EVALUATION

Financial Bids of only the technically qualified bidders in technical evaluation will be opened. The financial bids shall be evaluated for completeness and accuracy.

I / we accept all the terms and conditions of the tender notice.

Date:

Place:

Name and Signature of bidder with Seal

DISCLAIMER:

Even though adequate care has been taken in the preparation of this Tender Schedule the Bidder should satisfy himself that the Schedule is complete in all respects.

IIIT Tiruchirappalli not their employees make any representation or warranty as to the accuracy, reliability or completeness of the information in this Tender Schedule and it is not possible for IIIT Tiruchirappalli to consider the investment objective, Financial situation and particular needs of each party who reads or uses the Tenders Schedule. Certain prospective Bidders may have a better knowledge of the scope of work than others. Each prospective Bidder should conduct his/her own investigations and analysis and check the accuracy, reliability and completeness of the information in the Tender Schedule and obtain independent advice from appropriate sources.

The Registrar, IIIT Tiruchirappalli reserves the right to change any or all of the provisions of this tender document. Such changes would be intimated to all parties procuring this tender document. The Registrar, IIIT Tiruchirappalli reserves the right to reject any or all the bids submitted in response to this tender document at any stage without assigning any reasons whatsoever.

Name and Signature of bidder with Seal

PART-I (TECHNICAL BID)

All the commercial conditions shall also be indicated in this part. Deviations, if any, to our specifications shall be brought out very clearly. Bidders shall mention point-wise and conform to technical specifications given in our Enquiry.

S No.	Particulars	Details
1	Bidder's name	
2	Registered office and Address	
3	Working Place of the office	
4	Year of Establishment	
5	Type of Firm (Ownership, Partnership, Pvt Ltd or Ltd Co.)	
6	Details of ownership (Name and Address of the Board of Director, Partners etc)	
7	Name of the authorised signatory who is authorised to sign all the relevant documents (power of attorney, if any to be submitted)	
8	Contact Details	
	Name of the contact person	
	Designation	
	Telephone Number (Office)	
	Mobile Number(s)	
	Email Id	

9	Address for communication	
10	Registration Numbers:	
	Firm Registration No.	
	GST No.	
	MSME Registration No.	
	Any other registration which is mandatory for such agencies stipulated by concerned authorities:	
11	Is it a latest ISO Certified company	YES/NO
12	PAN Number	
13	Total Annual Turnover for last three years	2021-22: Rs 2022-23: Rs 2023-24: Rs
14	Whether Agency has been blacklisted by any Govt or Semi-Govt. organization or any other organization? If yes, provide details	YES/NO
15	Do you accept all terms and conditions of tender document and signed the tender document?	YES/NO
17	Do you agree to provide services as per the Institute's requirement?	YES/NO
19	Have you submitted the previous work order(s), work completion certificate(s), satisfactory certificates, audited accounts statement / bank statement?	YES/NO
20	DD Number, Amount and Date of the EMDsubmitted	

21	Bank Particulars	

	Account name	
	Type of A/C: (SB/CA/CC)	
	A/C No.	
	IFS code	
	Name of the Bank	
	Branch	

Enclose all certificates in support of above statements.

Date:

Authorized Signatory

Place:

Name:
 Designation:
 Company:
 Contact No.

Company Seal

CHECK LIST

The Bidder may use the check list below, to ensure that the tender submitted is complete in all respects.

Cover (a) “**Technical Bid**” should contain the following documents:

S. No	Particulars	Yes	No
1	Signed the original tender schedule downloaded from the IIT Tiruchirappalli website.		
2	Crossed Demand Draft from National Bank towards EMD		
3	Experience certificates		
4	Relevant work orders		
5	Work satisfactory certificates, if any		
6	Financial turnover certificates issued from competent authority		
7	List of present clients with address & phone numbers		
8	Documents for having three years’ experience in Marketing and sale of Laboratory equipment		
9	Documents for supply and installation of Laboratory equipment or similar items to any educational institutions /autonomous bodies etc. for last three years		
10	Attested and Submitted all the relevant hard copies		
11	Latest Income Tax Saral form>Returns		
13	Copy of PAN card		
14	Copy of GST registration		
15	Copy of MSME registration		
17	Copy of ISO Certificate		
18	Signed undertaking by the Bidder/Agency (as per Annexure - 1)		

Cover (b) “**Financial Bid**” should contain the following documents:

S. No	Particulars	Yes	No
1	Signed undertaking by the Bidder/Agency (as per Annexure - 8)		

- Note:** i) All the pages of the original bid document may be serially numbered.
ii) The original bid document along with relevant proofs should be signed with seal.
iii) Annexure-8 and any other financial related documents should not be attached in the technical bid.

Signature of the Bidder with stamp

DECLARATION

(To be provided on letter head of the Bidder and submit along with Technical bid)

I / We _____ do hereby certify that our firm is not blacklisted and no enquiries / cases are pending against us by Govt. of India / Govt. of Tamil Nadu or by any State Board Universities, since inception of the firm / company.

All the terms and conditions given in the tender draft “**for supply and installation of Digital Communication Laboratory Components at Electronics and Communication Engineering department at** IIIT Tiruchirappalli, Tamil Nadu” issued by IIIT Tiruchirappalli, Tamil Nadu, are acceptable to us.

We also certify that the information mentioned in the submitted documents is true and complete in every respect and explicitly agree that in case at a later date it is found out by the Institute (IIIT Tiruchirappalli, Tamil Nadu) that any details provided herein by us are incomplete/incorrect, any contract given to us may be summarily terminated forthwith, our firm may be blacklisted, and that the Institute may also initiate any other legal/penal proceedings, as deemed fit by it.

Date:

Place:

Authorized Signatory

Name:

Designation:

Company:

Contact No.

Company

Seal:

BID SECURITY DECLARATION FORM

Date:

Name of Work/Item Description:

Tender No. and Date:

To (insert complete name and address of the purchase)I/We. The undersigned,

declare that:

I/We understand that, according to your conditions, bids must be supported by a Bid Securing Declaration.

I/We accept that We may be disqualified from bidding for any contract with you for a period of one year from the date of notification if I am /We are in a breach of any obligation under the Bid conditions, because I/We

- a) Have withdrawn/modified/amended, impairs or derogates from the tender, my/our Bid during the period of bid validity specified in the form of Bid; or
- b) Having been notified of the acceptance of our Bid by the purchaser during the period of Bid validity (i) fail or reuse to execute the contract, if required, or (ii) fail or refuse to furnish the Performance Security, in accordance with the Instructions to Bidders.

I/We understand this Bid Securing Declaration shall cease to be valid if I am/we are not the successful Bidder, upon the earlier of

- (i) the receipt of your notification of the name of the successful Bidder or
- (ii) thirty days after the expiration of the validity of my/our Bid.

Signed: _____(signature of person whose name and capacity are shown) in the capacity of _____ (legal capacity of person signing the Bid Securing Declaration)

Name: _____(complete name of person signing the Bid Securing Declaration) Duly authorized to sign the bid for an on behalf of (complete name of Bidder)

Dated on _____ day of _____(date of signing)

Corporate Seal (where appropriate)

Note:

- (i) In case of a Joint Venture, the Bid Securing Declaration must be in the name of all partners to the Joint Venture that submits the bid.
- (ii) This letter should be on the letterhead of the quoting firm and should be signed by a Competent Authority. Non-submission of this will lead to DISQUALIFICATION of bids.

FALL CLAUSE NOTICE CERTIFICATE

(To Be Submitted in Appropriate Format)

This is to certify that we have offered the maximum possible discount to you in our Quotation No.

.....dated

..... (Please do not reveal the prices here, which will lead to outright rejection of your bid). The prices charged for the Stores supplied under tender should under no event be higher than lowest prices at which the party sells the items of identical description to any other Govt. organization/PSU's/Central Govt, /State Govt. Autonomous bodies/Central/state Universities/Central/State Educational Institutions, failing which the "FALL CLAUSE" will be applicable. The institute will look into a reasonable past period to ensure this. In case, if the price charged by our firm is found to be more, IIT Tiruchirappalli will have the right to recover the excess charged amount from the subsequent/unpaid bill of the supplier.

Note: This letter of authority should be on the letterhead of the quoting firm and should be signed by a Competent authority and having the power of attorney.

Specification and Sample Image of Laboratory equipment

Item. No	Name	Description
1.	AM Modulation & Demodulation Trainer Kit	<ul style="list-style-type: none"> • On board carrier and modulating signal generator with amplitude and frequency adjustable • Carrier and modulating signals are provided in the unit with frequency variable. • In-built regulated power supply • On board envelope detector • Schematic diagram provided in the front panel • Modulating Signal <ul style="list-style-type: none"> ○ Frequency : 300 Hz-3 KHz ○ Amplitude : (0-5) V • Carrier Signal <ul style="list-style-type: none"> ○ Frequency : 10 KHz - 50 KHz ○ Amplitude : (0-15) V • MODULATORS : <ul style="list-style-type: none"> ○ Type of Modulator <ul style="list-style-type: none"> ➤ Ring Modulator ➤ Transistor based Modulator ○ Method of Modulation <ul style="list-style-type: none"> ➤ Under Modulation ➤ Critical Modulation ➤ Over Modulation

2	Narrow Band FM Modulation & Demodulation Trainer Kit	<ul style="list-style-type: none"> * On board Sine wave generator * Provision to study Modulation & Demodulation in the same unit * Test points to study different waveforms * In-built Audio power amplifier * Mic pre Amplifier * Built-in power supply * Sine Wave generator : Frequency - 100Hz to 1.2 KHz with amplitude adjustable, (0-5V) * FM Modulator : Direct FM * Carrier frequency : 20 KHz (Low), 367 KHz (High) * FM Demodulator : PLL Detector, Quadrature Detector, Foster Seelay Discriminator / Phase Discriminator, Ratio Detector are provided. * Audio power amplifier : Gain up to 100 * Mic pre amplifier : Gain up to 20.
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3	SSBSC or VSB Modulation & Demodulation Trainer Kit	<p>SSBSC:</p> <ul style="list-style-type: none"> * On board modulating Signal * On board Carrier Signal * Balanced Modulator * Balanced demodulator * Built in Power supply up to (+/-12V) * Modulating Signal : 100 KHz to 181 KHz * Carrier : 800 KHz to 1500 KHz * Modulator with offset adjustable * Filter: 3rd order butter worth filter. * Accessories: Chord, Set of Patch chords and manual. <p>VSB:</p> <ul style="list-style-type: none"> * On board signal generator. * On board carrier signal generator. * Various test and monitoring points are provided. * In build power supply. * Mimic diagram. * Detailed documentation * Connecting cable * Modulating Signal <ul style="list-style-type: none"> # Frequency : 65KHz to 200KHz. # Amplitude : up to 3 Vpp * Carrier Signal <ul style="list-style-type: none"> # Frequency : 650 KHz to 1.2MHz. # Amplitude : up to 1 Vpp * Modulator : Balanced modulator * Demodulator : Balanced de-modulator. * Connecting Cable : SP7 patch chords * Supply Voltage <ul style="list-style-type: none"> # AC : 230V / 50Hz. # DC : +12V, -12V, GND.
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4	<p style="text-align: center;">PAM Modulation & Demodulation Trainer Kit</p>	<ul style="list-style-type: none"> ○ IC Based PAM generator ○ In built message signal. ○ Active PAM, Demodulation. ○ In built power supply. ○ Test points provided. <p>Message signal</p> <ul style="list-style-type: none"> ○ Frequency : Up to 1 KHz (approx.) ○ Amplitude : 0 to 2V (adjustable) <ul style="list-style-type: none"> ○ PPM type : VCO based ○ Filter type : 4th order butter worth LPF ○ Filter cut off frequency : Up to 3 KHz ○ Power supply : +5V, ±12V, GND
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5	<p style="text-align: center;">PPM Modulation & Demodulation Trainer Kit</p>	<ul style="list-style-type: none"> • NE 555-based PPM generator • In built message signal. • Active PPM, Demodulation. • In-built power supply. • Test points provided. • Message signal <ul style="list-style-type: none"> ➤ Frequency : Up to 1 KHz (approx.) ➤ Amplitude : 0 to 2V (fixed) • PPM type : VCO based • Filter type : 4th order butter worth LPF • Filter cut off frequency : Up to 3 KHz • Power supply : +5V, ±12V, GND
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6	<p style="text-align: center;">PWM Modulation & Demodulation Trainer Kit</p>	<ul style="list-style-type: none"> • NE555-based PWM generator • In built message signal. • Active PWM, Demodulation. • In built power supply. • Test points provided. <p>○ TECHNICAL SPECIFICATION:</p> <ul style="list-style-type: none"> ▪ Sine source <ul style="list-style-type: none"> ○ Frequency : Up to 1 KHz ○ Amplitude : 0 to 3V (adjustable) ▪ Triangular wave generator <ul style="list-style-type: none"> ○ Frequency : Up to 1 KHz ○ Amplitude : ≈ 2 to 14V (adjustable) <ul style="list-style-type: none"> • PWM type : 555 based • Filter type : 4th order butter worth LPF • Filter cut off frequency : Up to 3 KHz • Power supply : +5V, ±12V, GND
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7	<p style="text-align: center;">ASK Modulation & Demodulation Trainer Kit</p>	<ul style="list-style-type: none"> • On board data generator circuit. • Auto / Manual mode (Data Generation) • External patching provision provided between the modulator and demodulator. • Built-in power supply. • Modulator and demodulator are separately provided. • Easy interconnections are made by patch cords. • Mode : Auto / Manual • Input Data Rate : 800Hz to 2 KHz • Any external TTL compatible sequence with frequency up to 2.1 KHz. • Carrier Frequency : Up to 20 KHz • Power supply ratings: 230V + 10%, 50Hz.
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8	FSK Modulation & Demodulation Trainer Kit	<ul style="list-style-type: none"> • Three types of I/P sources. • Manual Input • Square Input • RS232 Input • FSK Modulator with <ul style="list-style-type: none"> ○ Mark Frequency: Up to 1070 Hz ○ Space Frequency: Up to 1270 • PLL Based FSK Demodulator • Output provided through BS2 connector and serial port. • Built-in Power supply. • Communication of digital data up to 300 BPS. • Study of FSK modulation • Study of FSK demodulation • Transmission and reception of digital signal between
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9	Frequency Multiplier using PLL Trainer Kit	<ul style="list-style-type: none"> • In-Built signal generator. • Built-in power supply. • Various test points. • Multiplied signal selector switch. • Detailed documentation. • Signal Generator : Square Wave <ul style="list-style-type: none"> ○ Frequency : Up to 1.25 KHz. ○ Amplitude : Up to 5 V • Multiplied signal factor: 2, 4, 8,16,32,64,128,256. • Operating supply <ul style="list-style-type: none"> ○ AC : 230 V / 50 Hz. ○ DC : +5 V, GND. • Weight : 3 Kg. (Approx) • Multiple Signal Frequency 2.5 KHz, 5KHz, 10KHz, 20KHz, 40KHz, 80KHz, 160KHz & 320KHz.
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10	Wi-Comm Kit (Wireless Communication Trainer Kit)	<ul style="list-style-type: none"> • As Raspberry Pi based embedded Controllers become more and more awareness among students, the Carrier Board, based on Raspberry RP2040 Processor, which provides Dual Core Cortex M0+ Microcontroller, 16 GPIO, ADC, etc. to build many Embedded Applications and Study the Interfacing of Various Devices to RP2040. • The RP2040 Dual Core Processor is used to build this Carrier Board, which consists of Dual Core Cortex M0+ Microcontroller with Flash RAM, PWM, ADC and many on board features. <p>Features:</p> <ul style="list-style-type: none"> • Based on Raspberry RP2040 Dual Core Cortex M0+ MCU • Digital I/O Pins: 22 headers • UART, SPI, I2C • Memory: Flash : Up to 2 MB, SDRAM: 264KB • Clock Speed: up to 133 MHz • Microcontroller: Dual Core Cortex M0+, 32bit ARM MCU • Digital I/O Pins: 8 nos. • PWM Pins: 6nos. • Analog Inputs: 6no, Up to 12bit • Carrier Board Features: <ul style="list-style-type: none"> • 3-nos of Analog Inputs are terminated at P2 connector • Up to 12bits, 350Ksps • 1-no of Digital toAnalog is terminated at P5 connector • 6 PWM Signals terminated at P3 connector. • Buffer Provider for the PWM and Capture signals • RS232 - Com Port interface with PC • 20x4 Alphanumeric LCD Display • 4 Push Button switches for user applications and its expansion available in P8 connector. • On Board Devices <ul style="list-style-type: none"> • # LM 35 sensor 1 no • # LDR sensor 1 no
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		<ul style="list-style-type: none"># Ultrasonic sensor 1no# two nos of LED LED# Two nos of Micro switch# Buzzer 1 no#. Two nos of PWM termination connector#. one no of SPI Termination Connector#. Four nos of GPIO Termination connector# Two nos of ADC Termination connector
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11	Digital Storage Oscilloscope (DSO)	<p>DSOX1204A Oscilloscope: 70/100/200 MHz, 4 Analog Channels</p> <ul style="list-style-type: none"> • Bandwidth: 70 MHz, 100 MHz, or 200 MHz (selectable models) • Channels: 4 analog channels • Maximum Sample Rate: Up to 2 GSa/s • Memory Depth: Up to 1 Mpts • Waveform Update Rate: Up to 50,000 waveforms per second • Vertical Sensitivity: 1 mV/div to 10 V/div • Time Base Range: 5 ns/div to 50 s/div • Triggering Modes: Edge, Pulse Width, Video, and more • Connectivity: USB 2.0 (front and back), LAN port (optional) • Display: 7-inch WVGA (800 x 480) display • Math Functions: Add, Subtract, Multiply, FFT, and more • Serial Decoding: Optional, supports I2C, SPI, UART/RS232, CAN, and LIN <p>Performance:</p> <ul style="list-style-type: none"> • Vertical Resolution: 8 bits • DC Gain Accuracy: $\pm 3\%$ • Rise Time: 2.5 ns (for 200 MHz model) • Input Coupling: AC, DC, Ground • Input Impedance: $1\text{ M}\Omega \pm 2\%$, in parallel with 14 pF <p>Additional Features:</p> <ul style="list-style-type: none"> • Waveform Storage: Can store up to 10 waveforms internally • Measurement Features: Includes 22 automatic measurements like peak-to-peak voltage, frequency, rise time, etc. • Probes: Comes with passive probes (1 per channel) <p>Power and Physical:</p> <ul style="list-style-type: none"> • Power Supply: 100 – 240 V AC, 50/60 Hz • Dimensions: 313 mm x 154 mm x 134 mm (W x H x D) • Weight: Approx. 3.26 kg (7.2 lbs)
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12	Function generator	<p>EDU33212A Function Generator:</p> <ul style="list-style-type: none"> • Channels: 2 independent analog channels • Max Frequency: Up to 20 MHz • Waveform Types: <ul style="list-style-type: none"> ○ Sine, Square, Pulse, Ramp, Triangle ○ Noise, Arbitrary waveforms (customizable) ○ Harmonics, Exponentials, Sinc, DC, Gaussian Noise • Arbitrary Waveform Memory Depth: 8 Mpts (standard) • Maximum Sample Rate: Up to 250 MSa/s • Vertical Resolution: Up to 16 bits <p>Sine Wave:</p> <ul style="list-style-type: none"> • Frequency Range: 1 μHz to 20 MHz • THD (Total Harmonic Distortion): ≤ -70 dBc (up to 1 MHz) • Amplitude Flatness: ± 0.3 dB (up to 1 MHz) <p>Square Wave:</p> <ul style="list-style-type: none"> • Frequency Range: 1 μHz to 10 MHz • Rise/Fall Time: < 20 ns • Overshoot: $< 2\%$ <p>Pulse Wave:</p> <ul style="list-style-type: none"> • Frequency Range: 1 μHz to 10 MHz • Pulse Width: 16 ns minimum <p>Arbitrary Waveforms:</p> <ul style="list-style-type: none"> • Sample Rate: 250 MSa/s • Vertical Resolution: 16 bits • Waveform Length: Up to 8 Mpts <p>Output Characteristics:</p> <ul style="list-style-type: none"> • Amplitude Range: 1 mVpp to 10 Vpp (50 Ω load) • Offset Range: ± 5 V (50 Ω load) • Output Impedance: 50 Ω (typical) <p>Modulation Capabilities:</p> <ul style="list-style-type: none"> • AM, FM, PM, FSK, BPSK, PWM • Sweep: Linear, Logarithmic, up to 100 kHz • Burst Mode: Up to 1,000,000 cycles <p>Connectivity:</p>
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| | | <ul style="list-style-type: none">• USB Interface: USB 2.0 host and device• LAN Interface: Optional |
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Display and Controls:

- **Display:** 4.3-inch color display (TFT LCD)
- **Control:** Front panel buttons and rotary knob

Power and Physical:

- **Power Supply:** 100 – 240 V AC, 50/60 Hz
- **Dimensions:** 261 mm x 103 mm x 320 mm (W x H x D)
- **Weight:** Approx. 4.2 kg

<p>13</p>	<p>Spectrum Analyzer with tracking generator</p>	<p style="text-align: center;">9KHz to 4.5 GHz Spectrum Analyzer:</p> <ul style="list-style-type: none"> • Frequency Range: <ul style="list-style-type: none"> • Frequency Span: 9 kHz to 4.5 GHz • Frequency Resolution: Typically 1 Hz to 1 MHz • Resolution Bandwidth (RBW): <ul style="list-style-type: none"> • RBW Range: Adjustable, commonly from 1 Hz to 1 MHz • Video Bandwidth (VBW): <ul style="list-style-type: none"> • VBW Range: Adjustable, typically from 1 Hz to 1 MHz • Frequency Accuracy and Stability: <ul style="list-style-type: none"> • Frequency Accuracy: $\pm(0.1\%$ of reading + 0.1 ppm) • Frequency Stability: Typically ± 0.5 ppm to ± 1 ppm • Display and Resolution: <ul style="list-style-type: none"> • Display Type: LCD or LED with high resolution • Resolution: Usually 800 x 600 pixels or higher • Trace Memory: Ability to store multiple traces for comparison • Dynamic Range: <ul style="list-style-type: none"> • Display Dynamic Range: 70 dB to 100 dB, depending on the model • Third-Order Intercept Point (IP3): Typically around +15 dBm to +25 dBm • Measurement Capabilities: <ul style="list-style-type: none"> • Power Measurement: Absolute and relative power measurements • Frequency Counter: For precise frequency measurements • Amplitude Accuracy: ± 0.5 dB to ± 1.0 dB • Tracking Generator Specifications: <ul style="list-style-type: none"> • Frequency Range: 9 kHz to 4.5 GHz (typically matches the analyzer's range) • Output Power: Adjustable, typically ranging from -30 dBm to +10 dBm • Output Impedance: Usually 50 Ω • Frequency Resolution: High resolution for accurate tracking
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		<ul style="list-style-type: none">• Connectivity and Interfaces:<ul style="list-style-type: none">• Interfaces: USB, LAN, GPIB (IEEE-488), or Ethernet for remote control and data transfer• Marker Functions: Frequency and amplitude markers with delta and peak functions• Save/Recall: Ability to save and recall measurement settings and results • Additional Features:<ul style="list-style-type: none">• Peak Hold and Average Functions: For capturing transient signals and averaging noise• Auto-Scale: Automatic adjustment of scale for optimal viewing• Pre-Selector: To enhance measurement accuracy at high frequencies• Sweep Time: Adjustable sweep time for different applications • Environmental and Power Specifications:<ul style="list-style-type: none">• Operating Temperature: Typically 0°C to 50°C• Power Supply: AC 100-240V, 50/60 Hz
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14	PLL IC 565	<ul style="list-style-type: none">• LM565 phase locked loop (PLL) IC:• Power supply: The power supply range is ± 5 to ± 12 volts.• Frequency stability: The VCO has a frequency stability of up to 200 ppm/$^{\circ}$C.• Demodulated output: The linearity of the demodulated output is 0.2%.• Phase detector input: The phase detector input is compatible with TTL and DTL.• Square wave output: The PLL has a square wave output.• Hold in range: The hold in range is adjustable from $\pm 1\%$ to $> \pm 60\%$.
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15	Attenuators (for adjusting the power levels of signals)	a. 1 dB b. 3 dB c. 5 dB d. 10 dB e. 15 dB f. 20 dB g. 30 dB
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16	Cables and Connectors (Coaxial cables, SMA connectors, and Adapters)	<ul style="list-style-type: none">• RG58 Size• RG316 Size• SMA connectors• SMA Crimping Connector• Male• Female• Adapters• SMA Male to Male• SMA Female to Female• SMA Male to Female
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SCHEDULE OF QUANTITY
(To Be Submitted in Appropriate Format)

S. No.	Description of the Item	Quantity (Nos.)
1.	AM Modulation / Demodulation Trainer Kit	1
2.	Narrow Band FM Modulation & Demodulation Trainer Kit	1
3.	SSBSC or VSB Modulation & Demodulation Trainer Kit	1
4.	PAM Modulation & Demodulation Trainer Kit	1
5.	PWM Modulation & Demodulation Trainer Kit	1
6.	PPM Modulation & Demodulation Trainer Kit	1
7.	ASK Modulation & Demodulation Trainer Kit	1
8.	FSK Modulation & Demodulation Trainer Kit	1
9.	Frequency Multiplier using PLL Trainer Kit	1
10.	Wi-Comm Trainer Kit	1
11.	Digital Storage Oscilloscope (DSO)	10
12.	Function generator	10
13.	Spectrum Analyzer with tracking generator	1
14.	PLL IC 565	10
15.	Attenuators (for adjusting the power levels of signals)	2
16.	Cables and Connectors (Coaxial cables, SMA connectors, and Adapters)	3

Note : In case of increase in quantity upto 10%, the items will be purchased for the same amount quoted by the bidder (L1)

COMPLIANCE STATEMENT**(Part of Technical Bid)****(To Be Submitted in Appropriate Format)***The vendor shall,*

1. Prepare, sign and upload the Compliance Statement of the specification of the items in the format given below along with the technical bid in the company letter head.
2. Submit separate Compliance Statement of specification sheets for each item
3. Ensure that the component number and heading in the Technical Specifications is clearly mentioned in the document. If there are any deviations from the specifications mentioned by IIT Tiruchirappalli, the vendor should clearly indicate the deviations and give reasons for the deviation with proper justification.
4. Provide the technical leaflet/literature/catalogue or any relevant document for all the quoted items/components to IIT Tiruchirappalli. The information provided in the compliance statement without supporting documents will not be considered for the evaluation of the technical bid and will be treated as non-compliance and may lead to the disqualification of the technical bid.
5. Clearly respond to every requirement given in the technical specifications. Lack of clarity may be considered as lack of information and may subsequently lead to disqualification of the technical bid.

Format of Compliance Statement:

Item No.	IIT Tiruchirappalli's technical specification of components as given in Annexure-5	Specifications of model by the vendor	Vendor's specification complies with IIT Tiruchirappalli's technical specification? (YES/ NO)	Deviation, if any, to be indicated in unambiguous terms	Page no. of relevant specification for the quoted model in the technical manual/ leaflet

PART-II FINANCIAL BID

(To be provided on letter head of the Agency)

To

The Director
IIT Tiruchirappalli, Tiruchirappalli, Tamil Nadu

Sir,

Sub: Tender for supplying and Installation of Digital Communication Laboratory Components at IIT Tiruchirappalli, Tamil Nadu.

Ref: : **IITT/ECE/Laboratory/2024/09-01, DATED: 13/09/2024**

With the above cited reference and subject, we submit herewith our financial bid.

Sl.no	Description	Unit Price	Req. Qty	Rate for Req. Qty
1.	AM Modulation & Demodulation Trainer Kit		1	
2.	Narrow Band FM Modulation & Demodulation Trainer Kit		1	
3.	SSBSC or VSB Modulation & Demodulation Trainer Kit		1	
4.	PAM Modulation & Demodulation Trainer Kit		1	
5.	PWM Modulation & Demodulation Trainer Kit		1	
6.	PPM Modulation & Demodulation Trainer Kit		1	
7.	ASK Modulation & Demodulation Trainer Kit		1	
8.	FSK Modulation & Demodulation Trainer Kit		1	
9.	Frequency Multiplier using PLL Trainer Kit		1	
10.	Wi-Comm Trainer Kit		1	
11.	Digital Storage Oscilloscope (DSO)		10	
12.	Function generator		10	
13.	Spectrum Analyzer with tracking generator		1	

14.	PLL IC 565		10	
15.	Attenuators (for adjusting the power levels of signals)		2	
16.	Cables and Connectors (Coaxial cables, SMA connectors, and Adapters)		3	
Total Amount = ()				
In words ()				

NOTE:

1. Rate quoted should be **inclusive of all taxes/levies** (service tax /GST and any other statutory Central/State Govt. taxes).
2. No claim for compensation or loss due to fluctuations in the market rate of any item or any other reasons/ causes will be entertained.
3. If there is a discrepancy between the rate quoted in words and in figures, the value in words shall prevail.
4. Bidder with the lowest quoted amount shall be selected as L-1.

Date:

Signature of the Bidder with seal

Place:

Name:

(ADDRESS SLIP)
Please paste this on your envelope)

Tender No. & Date: _____

Name of the item(s): _____

(as mentioned in the tender)

Due Date: _____

To,

TENDER BOX
C/o. The Director,
Indian Institute of Information Technology
Tiruchirappalli, Sethurapatti,
Tiruchirappalli - 620012,
Tamil Nadu.

From:

Address:

Contact No:

Email ID: