



Ref. e-Tender Notice No. NITJ/PUR/EE/223/2020/e-tender No-63/2022

Please find enclosed herewith the following:		Page No.
1.	e-Tender Notice No. NITJ/PUR/EE/223/2020/e-tender No-63/2022 & Schedule for Opening of the e-Tender	2
2.	Annexure-I (Detail of Equipment, Tender Fee & EMD)	3
3.	Important Note	4
4.	Instruction to Tenderers	5-7
5.	Tender Evaluation	8-9
6.	Terms & Conditions	10-11
7.	Acceptance of terms and conditions	12
8.	Questionnaires A & B	13-14
9.	Performa for performance statement	15
10.	Annexure 'A' (Specifications of the Equipment)	16-32
11.	Annexure 'B' & 'C' (Format For Performance Bond/Guarantee & Format For Performance Bond (Bank Guarantee))	33-34
12.	Annexure – 'D' (Format for Manufacturer's Authorization Form)	35
13.	Annexure- 'E' (Declaration Regarding Blacklisting/ Debarring for taking part in Tender)	36
14.	Annexure –'F' (Certificate of Warranty)	37
15.	Annexure-'G' (Self Declaration for local content)	38

Assistant Registrar
Dr. B. R Ambedkar NIT Jalandhar
Email: arpurchase@nitj.ac.in



THIS DOCUMENT IS FOR REFERENCE ONLY. ONLY E-TENDERS WILL BE ACCEPTED

e-Tender Notice No. NITJ/PUR/EE/223/2020/e-tender No-63/2022

National Institute of Technology, Jalandhar invites e-tender for Purchase of Various Equipments/ Instruments/ Kits for Electric Drives and Control Lab for the Department of Electrical Engineering as per detail available at Annexure-I along with Tender Fee & EMD of the Institute as per details given below:

I.	Downloading & Submission of Online e-tender/bids	Start Date: 10.11.2022 at 05: 10 PM
II.	Last date of submission of online bids	End Date: 01.12.2022 upto 05:10 PM
III.	Physical submission of Tender Fee and EMD	End Date: 02.12.2022 upto 05: 10 PM
IV.	Opening of Technical e-Bid (online)	02.12.2022 at 05: 10 PM

Detailed Terms and Conditions are available in e-tender document. The bid document can be downloaded from the [CPP Portal](#).

Complete tender document is available for reference purposes on Institute website www.nitj.ac.in and [CPP Portal](#). Only e-tenders will be accepted.

NOTE: This is a domestic Tender according to the DPIIT Order dated 16.09.2020 and subsequent amendments to the order for Public Procurement Preference & PROVISION FOR LOCAL SUPPLIERS TOWARDS PREFERENCE TO MAKE IN INDIA. The bidder required to declare on the letter head the percentage of Local content for the quoted instrument/Item and submit with the Technical Bid as per Annexure-G. Bidder should also give details of the location(s) at which the local value addition is made in the Annexure.

Registrar



Ref. No. e-Tender Notice No. NITJ/PUR/EE/223/2020/e-tender No- 63/2022

Detail of Equipment, Tender Fee & EMD are as under:

Sr. no.	Item/Equipment	Qty.	Tender Fee	EMD
1.	Single Phase Rectifier Trainer (AC-DC)	01 No	Rs. 500/-	Rs. 28,900/-
2.	Chopper Trainer (DC-DC)	01 No		
3.	Single Phase Inverter Trainer (DC-AC)	01 No		
4.	Microcontroller Based Three Phase Induction Motor Drive	01 No		
5.	Microcontroller Based Bldc Motor Drive	01 No		
6.	PMSM Vector Control Drive with PMSM Motor	01 No		
7.	Performance Investigation of Digitally and Computerized Controlled Four-Quadrant Operation of Dc Motor using 1-Phase Dual Converters with Analysis of Circulating and Non Circulating Modes	01 No		

Note: The quantity of required equipment/item may vary as per requirement.

***Exemption of Tender fee & EMD will only be given to MSME/NSIC registered bidders.**



Important Note

1. All corrigenda, addenda, amendments and clarifications regarding this tender document will be uploaded on the website www.nitj.ac.in and CPP Portal and not in the newspaper; Bidders shall keep themselves updated with all such developments.
 2. In case, the last date of receipt/opening of bids falls on holiday, the bids shall be receipt/opened on the next working day at same time.
 3. In case, the last date of submission of EMD & Tender fee falls on holiday, the EMD & Tender fee shall be submitted on the next working day at same time.
 4. Tenderer who have downloaded the tender document form from the institute website, shall submit a declaration along with tender document that I/We have downloaded the Tender Form from the institute website www.nitj.ac.in and I/we have not tempered /modified the tender form in any manner. In case, if the same is found to be tempered/modified in any manner, I/we understand that my/our tender will be summarily rejected and I/we are liable to be banned from doing business with institute.
 5. **Tender fee of Rs.500/- (Non- refundable) in the form of DD in favour of Director, D R B R Ambedkar NIT, Jalandhar.**
 6. **EMD (refundable) in the form of DD in favour of Security- A/c. DR B R Ambedkar NIT, Jalandhar.**
 7. **Both EMD and Tender fee are to be submitted as per dates mentioned in schedule, failing which e-bids will not be considered.**
- ❖ **All the bidders are required to submit the Tender Fee and EMD as per requirement of tender document failing which bids received straightway rejected and bid will be treated invalid.**
 - ❖ **Note: If the bidder inadvertently or otherwise upload the quoted rates in the technical bid, the bid will be straightway rejected and treated invalid.**
 - ❖ **If the bidder is exempted for payment of Tender Fee and EMD as NSIC/MSME registered bidders, then bidder is required to submit NSIC/MSME exemption certificate for same. The Certificate must be valid as on last date of submission of bid.**

Tenderer must submit a scanned copy (duly signed and stamped) regarding terms & conditions as per our tender documents along-with make/model, specifications, bill of quantity as per required equipment in the technical bid for examine the bid as per our institute tender documents. It is noted that no rate should be depicted in the letter head.



Instructions to Tenderer

1. No tender will be accepted in physical form. The bidders shall have to submit their bids online in Electronic Format under Digital Signatures. For participation in the e- tendering process, the bidders need to register themselves on CPP Portal.
2. Bids are to be submitted online and opened online as per time given failing which no tender will be considered.
3. Bids will be opened online as per time given schedule.
4. **Before submission of online bids, bidders must ensure that scanned copies of all the necessary/relevant documents have been uploaded with the bid which should be duly signed and stamped. The duly signed and stamped copies of Terms & Conditions of the tender, reply of the Questionnaire of Plant & Machinery and other documents of the Tender & Annexures must be uploaded, failing which their bids may be rejected.**
5. NIT JALANDHAR, will not be responsible for any delay in online submission of bids due to any reason whatsoever.
6. **Bidders should also upload the scanned copies of Tender fees/EMD/Exemption Certificate as specified in the tender documents along with online technical documents. EMD in the form of a Demand Draft in favour of the Security – A/c. Dr B R Ambedkar NIT, payable at Jalandhar (refundable separate) and Tender Fee in the form of a Demand Draft in favour of the Director, Dr B R Ambedkar NIT, payable at Jalandhar (Non- refundable separate) should also be submitted in physical form to the following address as per scheduled time given for physical submission of EMD and Tender fee. The Envelope should be super- scribed as EMD and Tender Fee for Tender for Supply of Various Equipments / Instruments/ Kits and sent to following address:-**
**Kind Attention- Assistant Registrar (Purchase Section) Director,
Dr B R Ambedkar National Institute of Technology,
G T Road Amritsar By Pass, Jalandhar-144001, Punjab (India).**
7. The details of EMD specified in the tender document should be same as submitted online (scanned copies). Otherwise tender will be rejected summarily.
8. The conditional bids shall not be considered and will be out rightly rejected.
9. The Financial Bid through e-tendering process shall be opened of only those bidders, who will qualify in the technical bid and approved by the Purchase Committee/Technical Experts. The date, time & place of opening of the financial bid(s) will be intimated in due course of time.

Read and Accepted

(Signature & Stamp of Tenderer)



10. At any time prior to the deadline for submission of bid, the institute may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective tenderer(s), modify the tender document by issuance of an amendment.
11. The amendment will be uploaded on Institute website and CPP Portal only. In order to provide reasonable time to prospective tenderer(s), for preparing their bid as per amendment, the institute may, at its discretion extend the deadline for the submission of tender.
12. **The supplier must upload the original manuals / catalogue and Make/Model of the Equipment /Item. Otherwise bid is liable to be rejected.**
13. The Institute is not liable to pay any interest on EMD. Earnest money deposit shall be forfeited, if the tenderer, withdraws its bid during the period of tender validity. The Earnest money deposit of the tenderer, whose tender has been accepted, will be returned on the submission of **performance security @ 3% of the total value of the offer. The performance security will be kept till the warranty period + 02 months more of the Equipment /Item. The warranty period will start from the date of satisfactory installation of the Equipment /Item duly given by the concerned department.** Earnest money deposit of the successful tenderer shall be forfeited, if it refuses or neglects to execute the contract or fails to furnish the required performance security within the time frame as specified by the institute. The EMD(s) of other Bidder(s) whose offer are found according to required specifications/ lowest will be released after finalization of Technical Bids/ Lowest Bid/Purchase.
14. The Format of Performance Bank Guarantee bond or Performance Bank Guarantee issued by the bank as per the format given in **Annexure "B" & "C"**.
15. Delivery time is the essence of the contract and must be met with.
16. Nearest specifications/better specifications can be considered. In case of deviation, complete justification should be furnished with proper documents.
17. The Director may accept a tender in part or whole of the quantity offered, reject any tender without assigning any reasons and may not accept the lowest bidder. Further in case of any doubt/dispute, the decision of the Director of the Institute shall be final.
18. The offer shall be kept valid for minimum 120 days.

Read and Accepted.

(Signature & Stamp of Tenderer)



19. a) Either the agent/ dealer on behalf of the Principal/OEM or Principal/OEM itself can bid but both cannot bid simultaneously for the same item/product in the same tender.
- b) If an agent/ dealer submits bid on behalf of the Principal/OEM, the same agent /dealer shall not submit a bid on behalf of another Principal/OEM in the same tender for the same item/product.
- c) Only one agent/dealer of single Principle/OEM can submit the bid. If more than one agent/dealer of same OEM/Principal quote in the tender, then bids of all the bidders of single OEM/Principle are liable to be rejected.
- d) All offers other than those from the Principal/OEM should be supported by an authority letter from the manufacturer authorizing the dealer /supplier to tender on their behalf as per **Annexure-D**. In case of manufacturer, a certificate or a copy thereof to the effect that the bidder is a manufacturer of the Equipment /Item must be accompanied with the technical bid.
20. The supplier will be responsible till the entire stores contracted for, arrive in good condition at destination.
21. The tenderer should not have been debarred and/ or blacklisted by any Central Government/ or any State Government Department(s). This must be supported by an affidavit as per format given in Annexure-“E”.
22. If any information furnished by the bidder is, at any stage found to be incorrect/false/fabricated, the Institute shall have the absolute right to forfeit the EMD, warranty/performance guarantees or/and security deposits, in addition to cancellation of contract, and in accordance with law, such other actions may be taken like black-listing of the bidder etc.

Read and Accepted.

(Signature & Stamp of Tenderer)



TENDER EVALUATION

Institute will evaluate all the proposals to determine whether these are complete in all respects as specified in the tender document. Evaluation of the proposals shall be done in two stages as:

(a) Stage – I (Technical Evaluation):

- (i) Institute shall evaluate the technical bid(s) to determine the following like the bid qualifies the essential eligibility criteria or not, the tenderer has submitted the EMD & Tender fee or not, any computational errors have been made or not, all the documents have been properly filled or otherwise, all the documents have been submitted/ uploaded with technical bid or not, the specifications, Make/Model, Catalogue of quoted Equipment /Item are as per requirement tender specifications or not, Authorization of Dealer / Distributor/ Exclusive Agent certificate from manufacturer is in order or not, Sales & service policy of equipment / item during warranty period and after warranty period will also be seen, location of their authorized service center will also be seen for evaluation etc.

After evaluation of technical bid(s), a list of the qualifying tenderer (s)/ bidder (s) shall be made. Short-listed tenderer(s) will be informed of the date, time and place of opening of financial bid(s) and they may attend or depute their authorized representative/s to attend the schedule of opening of financial bid(s) on the scheduled date and time, if they wish to do so. The representative(s) should have a letter of authority to attend the price bid(s) opening event.

Read and Accepted

(Signature & Stamp of Tenderer)



PART – II (e-FINANCIAL BID):

- a) Bidders should offer the rates as per the format of BOQ as available on CPP Portal. **Detailed bill of material/quantity is also to be provided along with the price breakup of each item as per requirement of the tendered specification of the equipment in the online price bid at [CPP Portal](#).**

❖ **Note: The quoted amount as filled in the Annexure(s) of online financial bid and detailed bill of material/quantity provided with price break up of each item in the online financial bid should be tallied and both must be same, otherwise bid will be treated invalid.**

ARBITRATION:

In case of any dispute or difference arising out in connection with the tender conditions/job order/Contract, the Institute and the Seller/Service Provider will address the dispute/difference for a mutual resolution and failing which, the matter shall be referred for arbitration to a sole Arbitrator to be appointed by the Institute.

The Arbitration shall be held in accordance with the provisions of the Arbitration and Conciliation Act, 1996 and the venue of arbitration shall be at Jalandhar only. The decision of the Arbitrator shall be final and binding on both the parties.

JURISDICTION:

The courts at Jalandhar alone will have the jurisdiction to trial any matter, dispute or reference between parties arising out of this tender / contract. It is specifically agreed that no court outside and other than Jalandhar Court shall have jurisdiction in the matter.

Read and Accepted.

(Signature & Stamp of Tenderer)



(TERMS AND CONDITIONS (FOR THE SUPPLY OF GOODS, EQUIPMENT /ITEM))

1. Rate should be quoted F.O.R NIT Jalandhar and In INR only.
2. Where the Equipment / Machinery/ Instrument are composed of several sub units/components, the rate should be quoted for each subunit/component separately. NIT Jalandhar reserves the right to increase or decrease the number of sub units/components and number of Equipment / Machinery/ Instrument according to its requirements.
3. The institute being government educational institute is having Excise and Custom duty exemption in terms of government notification No. 51/96-customs Dt. 23-7-1996 and No. 10/97-central excise Dt. 1-3- 1997 as amended from time to time, therefore taxes be quoted accordingly and this must be depicted in Price Bid clearly.
4. GST or any other chargeable duty where applicable must be specifically mentioned, failing which no tax or duty will be allowed at subsequent stage.
5. All items shall be indicated both in words as well as in figures. If there is difference between amount quoted in words and figures, amount quoted in words shall prevail.
6. **Payment:**
 - (a) 100% payment will be made against physical delivery, inspection, installation, training of the Equipment/Machinery/Instrument etc. in the institute, receipt of satisfactory working report of the Equipment / Machinery/Instrument etc. and receipt of Performance Bank Guarantee @ 3%.
7. **Warranty: Rates should be quoted with comprehensive warranty.** Besides this, policy regarding after sale service on the expiry of warranty period of Equipment / Machinery/Instrument etc. may be explained. The bidders should attach duly signed and stamped certificate of **warranty** as per **Annexure-F** with the technical bid.
8. **Training: In house training (where applicable) after the installation and commissioning of Equipment / Machinery/Instrument etc. shall be provided by the supplier.**
9. **Delivery:** Delivery date will be mentioned in the supply order. The time and date of delivery or dispatch stipulated in a supply order shall be deemed to be the essence of the supply order and if the supplier fails to deliver or dispatch any consignment within the period prescribed for such delivery, the delayed consignment will be accepted subject to penalty as laid down in the supply order, which will be recovered from the pending payments.

Read and Accepted.

(Signature & Stamp of Tenderer)



1. No recovery of penalty will be made, if the delayed supplies are acceptable by extending the delivery period by the Director with our any LD charges.
 2. Director will allow extension on the request of the supplier by recording in writing that in exceptional circumstances the supply was beyond the control of the supplier and there was no loss to the institute.
 3. Penalty on account of delay, Director NIT, Jalandhar reserves the right to impose 0.5% (Half) per cent penalty per week on account of delay in supply, if delivery received after expiry of the original delivery period. The total penalty will not exceed 10% of the value of the delayed goods.
- 10. Installation:** Supplier has to install the Equipment / Machinery/ Instrument within two to three weeks from the receipt of the Equipment / Machinery/Instrument etc. in NITJalandhar.
- 11. Spares and Accessories,** wherever required should be quoted separately and clearly, even if these are not asked for.
- 12. Site Preparation:** The supplier shall inform NIT Jalandhar about the site preparation, if any, needed for the installation, immediately after receipt of the supply order. Supplier must provide complete details regarding space and all infrastructural requirements needed for the Equipment / Machinery/Instrument etc which NIT Jalandhar should arrange before the arrival of Equipment / Machinery/Instrument etc to ensure its early installation and smooth operation thereafter. The supplier may offer his advice and render assistance to NIT Jalandhar in the preparation of the site and other pre installation requirements.
- 13.** The total scope of work includes the supply, installation, satisfactory commissioning and testing of the Equipment / Machinery/Instrument etc by the supplier, training at NIT Jalandhar, method development and validation for parameters as mentioned in specifications at **Annexure-A**. The supplier will complete installation & Commissioning of Machine within two to three weeks from the date of receipt of Equipment / Machinery/Instrument etc. of NITJ.
- 14.** Details about the service center for the quoted Equipment / Machinery/Instrument etc. in India may be mentioned.

Read and Accepted.

(Signature & Stamp of Tenderer)



Dr B R AMBEDKAR NATIONAL INSTITUTE OF TECHNOLOGY
G T Road By Pass, Jalandhar-144011, Punjab (India)
EPABX-0181-2690301-453 Email registrar@nitj.ac.in

Acceptance

We _____ read and accept the instructions to the tenderer, terms & conditions and all other documents as mentioned in the tender and shall comply with them strictly.

Name of Bidder _____ Signature

Address _____ Seal of firm:

_____ Date



Questionnaires A & B

QUESTIONNAIRE FOR PLANT & MACHINERY

Note: Please submit the reply in detail and also enclose the necessary documents with proof where required as per Questionnaire. These documents must be submitted in the technical bid document.

Please state that you have submitted your quotations as per procedure mentioned below:-

- Bids consisting of technical details bringing out clearly in a separate sheet, the deviation in the specifications if any from that of tender enquiry specifications along with commercial terms and tender form.
1. Please attach list dully signed by you, for such spare parts and tools which are absolutely essential for proper maintenance and operation of machine for a period of two years giving full particulars of spare and tool with a price of each spare parts and tools separately.
 2. Please confirm that you have adequate servicing and spare parts facilities in India in respect of Equipment /Item tendered by you or that you should arrange to provide such facilities simultaneously.
 3. Please indicate that you guaranteed that before going out of production of spareparts, you will give adequate advance notice to the purchaser so that the institute may order his requirements of spares in one lot ,if he so desire.
 4. Please indicate that you guaranteed that if you go out of production of spare parts, then you will make available prints, drawings of the spare parts and specifications of the material at no cost if and when required in connection with Equipment /Item to enable the purchaser to fabricate or procure spare parts from other sources.
 5. Please confirm that you undertake to enter into a rate contract with the purchaser to supply spare parts on an agreed basis for an agreed period.
 6. Status:-
 - a) Indicate whether you are ISU or SSI
 - b) Are you registered with Government e-Marketing (GeM) for the item quoted? If so indicate whether there is any monetary limit or registration.
 - c) If you are a small scale unit registered with NSIC under single point registration scheme whether there is monetary limit.
 7. a) If you are registered either with NSIC or with Government e-Marketing (GeM), please State whether you are registered with Directorate of industries of the state government concerned.

b) If so, confirm whether you have attached a copy of the certificate, issued by Director of industries.
 8. Please indicate:-
Name & Full Address of your Banker
 9. Please indicate whether you agree to submit advance samples if called upon to do so within the specified period of 21 days.



10. Business name and constitution of firm:-i) The Indian company Act.1956 ii)
Indian partnership Act. 1932
iii) Any act, if not, who are the owner/partners (please give full name and address)

11. Whether the tendering firm is / are:-

- i) Manufacturers authorized agents
- ii) Holders stock of the stores tendered for

iii) NBI manufacturer's agents please enclose with tender the copy of manufacturer's authorization.

12. Please state whether the inspection clause is acceptable to you

13. Here state specifically:-

- i) Whether the price quoted by you is to the best of your knowledge and belief is not more than the price usually charged by you on stores of the same natures, class of description to any private purchase either foreign or as well as government purchaser. If not state the reason thereof if any also indicates the margin of Difference.
- ii) In respect of indigenous items for which there is a controlled price fixed by law, the price quoted shall not be higher than that the controlled price and rates available on DGS&D/ Government e-Marketing (GeM) contract. The reason thereof should be stated.

14. State whether business dealing with you has been banned by Ministry/Department of supply or any other Govt. Department.

15. Please confirm that you have read all the instruction carefully and have complied with accordingly.

(Signature of Tenderer)

(_____)

1. Full Name & Address of the person signing

(_____)

2. Whether signing as proprietor /partners



Dr B R AMBEDKAR NATIONAL INSTITUTE OF TECHNOLOGY
G T Road By Pass, Jalandhar-144011, Punjab (India)
EPABX-0181-2690301-453 Email registrar@nitj.ac.in

PERFORMA FOR PERFORMANCE STATEMENT

(For the Period of last 3 years)

e-Tender Notice No. NITJ/PUR/EE/223/2020/e-tender No-63/2022						
Sr. No.	Order (full placed address of purchaser)	Order No. & Dated	Description and Qty. of Stores Ordered	Value of Order	Date of Completion of Delivery	Has the Equipment/ Item been satisfactory commissioned



CP-731

DETAILED TECHNICAL SPECIFICATIONS

1. Single-Phase Rectifier Trainer (AC-DC).

Trainer must be capable to studying different configurations of single-phase controlled rectifier.

Trainer must include:

- Power section for controlled and uncontrolled rectifier
- Power section for half-wave and full-wave rectifier.
- Power section for fully controlled and half controlled rectifiers
- Different types of inbuilt loading arrangements: R, R-L Load with Freewheeling diode should be provided & provision to connect E externally.
- Gate pulse generating circuit with a provision to study all intermediate stage waveforms.

Technical Specifications:

- Controlled (SCR based) as well as uncontrolled (Diode based) rectification.
- Various experimentation on single-phase rectifiers with a provision of observing current waveform.
- Trainer includes step down power supply, control circuit, power circuit and different types of loads.
- The kit should work directly with 230 V, 50 Hz, AC supply and other low power supplies required for the operation is derived internally.
- Step down supply voltage of 30 V AC, Load resistance of 200 Ω , Load inductance 100 mH should be provided.
- Proper isolation between control and power circuit is required.
- Loading arrangements should be a part of trainer and R Load and R-L Load with Freewheeling diode should be provided.
- Firing angle control from 5 to 175 degree

The setup must be consisting of the following:

1. Controller Card:

- SST89E516RD 8-bit MCU clocked @18.432MHz
- Buffered I/O Ports using 74HC573
- Keys for changing firing angle.
- 16x2 LCD (JHD162A) display
- UART section (IC Max 232)

2. Thyristor firing card:

- On board one ZCD transformer
- Delay generating circuit
- Carrier frequency multiplication
- TCA785 synchronized with ZCD
- TIP122 Transistor

Over



CP-730

- 02 numbers of Pulse transformer-based driver stage
- Gate resistor with anti-parallel diode

3. Power card:

- SCR (25A, 1200V) (4 Nos.)
- Diode 1N5408 (4 Nos.)
- Snubber circuit

List of Experiments:

- Single-phase half-wave uncontrolled rectifier with different types of load.
- Single-phase full-wave uncontrolled rectifier with different types of load.
- Single-phase half-wave-controlled rectifier with different types of load.
- Single-phase full-wave controlled rectifier with different types of load.
- Single-phase full-wave half-controlled rectifier with different types of load.
- Single phase SCR's Gate Pulses and other control signals.

4. Digital Storage Oscilloscope

50MHz Digital Storage Oscilloscope

- 50MHz 2 Analog Channels
- 1GSa/s Sampling rate
- 200Kpts memory
- 7" WVGA display
- $\geq 100,000$ waveform/s update rate
- Digital voltmeter and 5 – digit frequency counter upto scope bandwidth should be available
- Trigger Types Edge, pulse width, video, pattern/state, External
- Measurements Math Function-Add, subtract, multiply, divide, Automatic Measurements of Amplitude and time, FFT (phase), low-pass filter, Time & Voltage cursors, FFT (magnitude)
- Acquisition Modes: -Normal, Peak Detect, Averaging, High Resolution
- I/O Interface: -USB, LAN Port/GPIB, Software for waveform analysis
- Power Source 230 V AC
- Serial Protocol: I²C, UART/RS-232 with Lister/Table
- USB and LAN Interface with compatible software to connect and control the instrument and to build custom test sequence with the integrated test flow app to automate and visualize test result without the need for instrument programming
- Inbuilt Waveform Generator:- 20MHz function Generator Includes Bode Plot Features (Waveform Sine Square ramp, Pulse, DC, Noise.)Frequency Range Sine Wave (0.1Hz to 20MHz) and Square, pulse wave (0.1Hz to 10MHz).Amplitude 2mVpp to 20Vpp into Hi Z and 1mVpp to 10Vpp into 50 Ω .With AM, FM & FSK modulation feature should be available.
- The instrument should be supplied along with Bode Plot Training kit having following features:
 - Lower bandpass cutoff frequency: 3.2 kHz

OK



CP-729

- Center bandpass frequency: 50 kHz
- Upper cutoff frequency: 800 kHz
- Maximum input voltage: 10 VPP into 50 Ω
- Probe test points: VIN, BPFOUT, LPFOUT, GND (2X)
- Series component values: R = 50 Ω , L = 10 μ H, C = 1 μ F

Should have standard 3 Years warranty and 5 year calibration interval. Manufacture should have its own NABL accredited service center and calibration lab in India.

ACCESSORIES

- Standard Accessories to be supplied Two 1:1/10:1 Probe

OPERATING CONDITION

- Minimum Operating Temperature: 0 degree Celsius
- Maximum Operating Temperature: -50 degree Celsius
- Operating Humidity (RH): -95 percent

TEST REPORT DETAILS & TESTS

Availability of Test Reports from Central Govt / NABL approved / ILAC accredited lab to prove conformity to the specification:

- Set of experiment wise instruction working manual.
- Re-programming provision of IC/microcontroller.
- On campus demonstration and training of lab staff
- All components should be ISI mark and made by the reputed manufactures.
- Two years warranty.

Prave



CP-728

2. Chopper Trainer (DC-DC).

Trainer must be capable of studying different types of chopper circuits (Type A, B, C, D, E and step-up chopper).

Trainer must include:

- Power circuit for Type A, B, C, D, E and Step-up chopper.
- Different types of inbuilt loading arrangements: R Load, R-L Load, and provision to connect E externally.
- Control circuit with Frequency control and Duty ratio control methods.
- Step-up chopper operation.
- Motoring and regeneration operation.
- Gate pulse generating circuit with a provision to observe all intermediate stage waveforms.

Technical Specifications:

- Various experimentation on different chopper configurations with a provision of observing current waveforms.
- Trainer should include step down power supply, control circuit, power circuit and different types of loads internally.
- The kit should work directly with 230 V, 50 Hz, AC supply and other low power supplies required for the operation should be derived internally.
- Proper isolation between control and power circuit be provided.
- Loading arrangements with R Load and R-L Load should be part of trainer.
- Step down supply voltage of 24 V DC, Load resistance of 100 Ω , Load inductance 100 mH should be provided.
- 12 V battery should be provided for demonstrating regeneration mode.
- Microcontroller based control circuit with LCD and keyboard interfacing should be provided for selecting different operating modes.

The setup must consist of following:

1. Controller Card:

- SST89E516RD 8-bit MCU clocked @18.432MHz
- Buffered I/O Ports using 74HC573
- Interfacing Keys
- 16x2 LCD (JHD162A) display
- UART section (IC Max 232)

[Handwritten signature]



CP-727

2. MOSFET based inverter card:

- Buffer input through 7414
- Optical Isolation through 6N137
- Boot-strapping based firing using IR2130
- MOSFET IRF840 (400V, 8A)
- Diode MUR460
- On board over current trip circuit
- 24 V, 4.5A DC supply using SMPS

List of Experiments:

- Study of different chopper controlling methods.
- Study of gate pulses require for Class A/ Class B/ Class C/ Class D/ and other four types of Class E.
- Study of First quadrant / Type A Chopper with different types of Loads.
- Study of two-quadrant chopper with different loads.
- Study of four-quadrant chopper with different loads.
- Study of step-up chopper with different loads.
- Study of regeneration technique with four-quadrant chopper.

4. Digital Storage Oscilloscope

50MHz Digital Storage Oscilloscope

- 50MHz 2 Analog Channels
- 1GSa/s Sampling rate
- 200Kpts memory
- 7" WVGA display
- $\geq 100,000$ waveform/s update rate
- Digital voltmeter and 5 – digit frequency counter upto scope bandwidth should be available
- Trigger Types Edge, pulse width, video, pattern/state, External
- Measurements Math Function-Add, subtract, multiply, divide, Automatic Measurements of Amplitude and time, FFT (phase), low-pass filter, Time & Voltage cursors, FFT (magnitude)
- Acquisition Modes: -Normal, Peak Detect, Averaging, High Resolution
- I/O Interface: -USB, LAN Port/GPIB, Software for waveform analysis
- Power Source 230 V AC
- Serial Protocol: PC, UART/RS-232 with Lister/Table
- USB and LAN Interface with compatible software to connect and control the instrument and to build custom test sequence with the integrated test flow app to automate and visualize test result without the need for instrument programming

Q. No.



CP-726

- Inbuilt Waveform Generator:- 20MHz function Generator Includes Bode Plot Features (Waveform Sine Square ramp, Pulse, DC, Noise.) Frequency Range Sine Wave (0.1Hz to 20MHz) and Square, pulse wave (0.1Hz to 10MHz). Amplitude 2mVpp to 20Vpp into Hi Z and 1mVpp to 10Vpp into 50Ω. With AM, FM & FSK modulation feature should be available.
- The instrument should be supplied along with Bode Plot Training kit having following features:
 - Lower bandpass cutoff frequency: 3.2 kHz
 - Center bandpass frequency: 50 kHz
 - Upper cutoff frequency: 800 kHz
 - Maximum input voltage: 10 VPP into 50 Ω
 - Probe test points: VIN, BPFOUT, LPFOUT, GND (2X)
 - Series component values: R = 50 Ω, L = 10 μH, C = 1 μF

Should have standard 3 Years warranty and 5 year calibration interval. Manufacture should have its own NABL accredited service center and calibration lab in India

ACCESSORIES

- Standard Accessories to be supplied Two 1:1/10:1 Probe

OPERATING CONDITION

- Minimum Operating Temperature: 0 degree Celsius
- Maximum Operating Temperature: -50 degree Celsius
- Operating Humidity (RH): -95 percent

TEST REPORT DETAILS & TESTS

Availability of Test Reports from Central Govt / NABL approved / ILAC accredited lab to prove conformity to the specification

- Set of experiment wise instruction working manual.
- Re-programming provision of IC/microcontroller.
- On campus demonstration and training of lab staff.
- All components should be ISI mark and made by the reputed manufactures.
- Two years warranty.

Over



CP-725

3. Single-Phase Inverter Trainer (DC-AC).

Trainer must be including Following Features:

- Power circuit for single phase half-bridge inverter configuration
- Power circuit for single phase full-bridge inverter configuration
- Different types of loads: R Load and R-L Load
- Microcontroller based control circuit for gate pulse generation
- Different control circuits: Square Wave, Quasi Square Wave, Multiple PWM, Trapezoidal PWM, UNIPOLAR & BIPOLAR PWM
- In Quasi Square wave technique provision to eliminate 3rd, 5th or 7th harmonic should be provided.
- Provision for current waveform observation.

Technical Specifications:

- Popularly used basic controlling methods like Square Wave, Quasi Square Wave, Multiple PWM, Trapezoidal PWM, UNIPOLAR & BIPOLAR PWM should be provided.
- Trainer includes step down power supply, control circuit, power circuit and different types of loads internally.
- The kit should work directly with 230 V, 50 Hz AC supply and other low power supplies required for the operation are derived internally.
- Proper isolation between control and power circuit with DC link fuse be provided.
- Step down supply voltage of 24 V DC, Load resistance of 100 Ω , Load inductance 100 mH be provided.
- Loading arrangements should be a part of trainer, R and R-L Load should be provided.
- Microcontroller based control circuit with LCD and keyboard interfacing is provided for selecting different operating modes.

The setup must consist of following:

1. Controller card:

- SST89E516RD 8-bit MCU clocked @18.432MHz
- Buffered I/O Ports using 74HC573
- Interfacing Keys
- 16x2 LCD (JHD162A) display
- UART section (IC Max 232)

2. MOSFET based inverter card:

- Buffer input through 7414
- Optical Isolation through 6N137
- Boot-strapping firing using IR2130
- MOSFET IRF840 (400V, 8A) (4 Nos.)
- Diode MUR460 (4 Nos.)

Over



CP-724

- 15 V AC excitation supply
- On board over current trip circuit
- 24 V, 4.5 A DC supply using SMPS

4. Digital Storage Oscilloscope

50MHz Digital Storage Oscilloscope

- 50MHz 2 Analog Channels
- 1GSa/s Sampling rate
- 200Kpts memory
- 7" WVGA display
- $\geq 100,000$ waveform/s update rate
- Digital voltmeter and 5 – digit frequency counter upto scope bandwidth should be available
- Trigger Types Edge, pulse width, video, pattern/state, External
- Measurements Math Function-Add, subtract, multiply, divide, Automatic
- Measurements of Amplitude and time, FFT (phase), low-pass filter, Time & Voltage cursors, FFT (magnitude)
- Acquisition Modes: -Normal, Peak Detect, Averaging, High Resolution
- I/O Interface: -USB, LAN Port/GPIB, Software for waveform analysis
- Power Source 230 V AC
- Serial Protocol: PC, UART/RS-232 with Lister/Table
- USB and LAN Interface with compatible software to connect and control the instrument and to build custom test sequence with the integrated test flow app to automate and visualize test result without the need for instrument programming
- Inbuilt Waveform Generator:- 20MHz function Generator Includes Bode Plot Features (Waveform Sine Square ramp, Pulse, DC, Noise.)Frequency Range Sine Wave (0.1Hz to 20MHz) and Square, pulse wave (0.1Hz to 10MHz).Amplitude 2mVpp to 20Vpp into Hi Z and 1mVpp to 10Vpp into 50 Ω .With AM, FM & FSK modulation feature should be available.
- The instrument should have supplied along with Bode Plot Training kit having following features:
 - Lower bandpass cutoff frequency: 3.2 kHz
 - Center bandpass frequency: 50 kHz
 - Upper cutoff frequency: 800 kHz
 - Maximum input voltage: 10 VPP into 50 Ω
 - Probe test points: VIN, BPFOUT, LPFOUT, GND (2X)
 - Series component values: R = 50 Ω , L = 10 μ H, C = 1 μ F

Should have standard 3 Years warranty and 5 year calibration interval. Manufacture should have its own NABL accredited service center and calibration lab in India

ACCESSORIES

- Standard Accessories to be supplied Two 1:1/10:1 Probe
- OPERATING CONDITION

Q. 724



CP-723

- Minimum Operating Temperature: 0 degree Celsius
- Maximum Operating Temperature: -50 degree Celsius
- Operating Humidity (RH): -95 percent

List of Experiments:

- Study of single-phase half bridge inverter with different types of loads.
- Study of single-phase full bridge inverter with different types of loads.
- Study of FFT analysis of square wave inverter.
- Study of Quasi Square Wave (Q.S.W.) inverter.
- Study of Sinusoidal Pulse Width Modulated (SPWM) inverter.
- Study of T.P.W.M., M.P.W.M., Unipolar & Bipolar PWM inverter.
- Study of Gate pulses for IGBT's in different types of Modes.

TEST REPORT DETAILS & TESTS

Availability of Test Reports from Central Govt / NABL approved / ILAC accredited lab to prove conformity to the specification:

- Set of experiment wise instruction working manual.
- Re-programming provision of IC/microcontroller.
- On campus demonstration and training of lab staff
- All components should be ISI mark and made by the reputed manufactures.
- Two years warranty

Arora



CP-722

4. Microcontroller based Three-Phase Induction Motor Drive.

Trainer must be capable of studying Sinusoidal Pulse Width Modulated (SPWM) as well as Space Vector Modulated (SVM) inverter fed variable frequency drive operation.

Technical Specifications:

- The kit must comprise of single-phase uncontrolled rectifier, three phase inverter, 1 HP, 415 V, 50 Hz, 1440 RPM three phase induction motor with proximity as speed sensor and 32-bit Cortex M4 ARM Microcontroller based control circuit.
- Microcontroller based control circuit with LCD and keyboard interface should be provided for selecting different operating modes.
- Observation of intermediate stage waveforms of gate pulses generated.
- Digital and Analog mode of control should be possible. Analog mode of control be implemented through external interfaced circuit.
- MATLAB utility for viewing and controlling speed of the motor from personal computer.
- The equipment must work directly with 230 V, 50 Hz, AC supply. Proper isolation between control and power circuit should be provided.
- Observation of stator current through current transformers.

Motor Controller:

- STM32F407VGT6 ARM Cortex-M4 Board featuring 32-bit ARM Cortex-M4F core, 168 MHz, 1 MB Flash, 192 KB RAM
- On-board ST-LINK/V2 with selection mode switch, Power supply: through USB bus or from an external source.
- 8 General purpose input lines, 8 General purpose output lines, 16x2 LCD interface, Interface keys.
- 3 high speed digital outputs and 2 High speed digital input lines. 6 PWM outputs, 3 QEI (Quadrature Encoder Interface) inputs.
- 8 Analog inputs level shifted to 1.65V for AC signal interface.
- Over current protection

List of Experiments:

- Study of principle of Variable Frequency Drive (VFD).
- Study of SPWM control technique.
- Study of Relationship between Control Voltage, Modulation Index, frequency and Inverter Output Voltage in SPWM Inverter. (Digital/Analog Mode Control).
- V/f control of Induction Motor with SPWM Inverter.
- Study of SVM control technique.
- Study of Relationship between Control Voltage, Modulation Index, frequency and Inverter Output Voltage in SVM Inverter. (Digital Mode / Analog Mode Control).
- V/f control of Induction Motor with SVM Inverter.
- To study harmonic spectrum and THD of output waveforms.
- Comparison of SPWM and SVM control techniques.

Q. No.



Dr B R AMBEDKAR NATIONAL INSTITUTE OF TECHNOLOGY
G T Road By Pass, Jalandhar-144011, Punjab (India)
EPABX-0181-2690301-453 Email registrar@nitj.ac.in

CP-721

- Set of experiment wise instruction working manual.
- On campus demonstration and training of lab staff
- All components should be ISI mark and made by the reputed manufactures.
- Two years warranty

Arora



CK-720

5. Microcontroller based BLDC Motor Drive.

Trainer must be capable to for studying Brushless DC (BLDC) drive operation and control.

Technical Specifications:

- The kit comprises of 48 V SMPS, three phase inverter, 36V, 150 Watt continuous rating and 450 W Peak rating 0.32 N-m Rated Torque, 0.98 N-m Peak Torque, 15A Peak Current, Motor with Hall Effect Sensor and Optical Encoder, 4000 rpm BLDC motor, 500ppr encoder (speed sensor) and 32-bit Cortex M4 ARM Microcontroller based digital controller.
- Microcontroller based control circuit with LCD and keyboard interface for selecting different operating modes.
- Observation of hall sensor outputs, encoder pulses and gate pulses generated for BLDC motor.
- Open loop and closed loop speed control of BLDC motor.
- Speed estimation and closed loop control using hall sensor feedbacks and using encoder feedbacks.
- MATLAB utility for viewing and controlling speed of the motor from personal computer.
- The kit should work directly with 230 V, 50 Hz, AC supply.
- Proper isolation between control and power circuit.

Motor Controller:

- STM32F407VGT6 ARM Cortex-M4 Board featuring 32-bit ARM Cortex-M4F core, 168 MHz, 1 MB Flash, 192 KB RAM in an LQFP100 package.
- On-board ST-LINK/V2 with selection mode switch, Power supply: through USB bus or from an external source.
- 8 General purpose input lines, 8 General purpose output lines, 16x2 LCD display, interfacing keys.
- 3 high speed digital outputs and 2 High speed digital input lines. 6 PWM outputs, 3 QEI inputs.
- Analog inputs with level shifted to 1.65V for AC signal interface.

List of Experiments:

- To study gate pulse generation for BLDC motor using Hall Sensor Feedback.
- To study BLDC motor speed control using PWM technique.
- To study open loop speed control of BLDC motor with Hall sensor feedback.
- To study closed loop speed control (PI control) of BLDC motor with Hall sensor feedback.
- To study closed loop speed control (PI control) of BLDC motor with encoder feedback.
- Understanding effect of Gain factor and Integral Factor in closed loop control of BLDC motor.

Ques



Dr B R AMBEDKAR NATIONAL INSTITUTE OF TECHNOLOGY
G T Road By Pass, Jalandhar-144011, Punjab (India)
EPABX-0181-2690301-453 Email registrar@nitj.ac.in

CP 719

- Set of experiment wise instruction working manual.
- On campus demonstration and training of lab staff
- All components should be ISI mark and made by the reputed manufactures.
- Two years warranty

Over



CP-718

6. PMSM Vector control drive with PMSM motor.

Trainer to study sensed and sensor-less control of Permanent Magnet Synchronous Motor (PMSP) drive operation.

Technical Specifications:

- The equipment comprises of 48V SMPS, three phase inverter, 36 V, 150W continuous rating and 450W Peak rating, 0.32 N-m Rated Torque, 0.98 N-m Peak Torque, 15A Peak Current, Motor with Hall Effect Sensor and Optical Encoder with Adequate Rating, 4000 rpm PMSM motor, 500 ppr encoder and 32-bit ARM Microcontroller based control circuit.
- Microcontroller based control circuit with LCD and keyboard interface for selecting different operating modes.
- Scalar Control, Sensorless Vector Control and Sensed Vector Control.
- Observation of intermediate stage waveforms of gate pulses generated.
- Open loop and closed loop speed control of motor.
- MATLAB utility for viewing and controlling speed of the motor from personal computer.
- The kit should work directly with 230 V, 50 Hz, AC supply. Proper isolation between control and power circuit should be provided.

Motor Controller:

- STM32F407VGT6 ARM Cortex-M4 Board featuring 32-bit ARM Cortex-M4F core, 168 MHz, 1 MB Flash, 192 KB RAM.
- On-board ST-LINK/V2 with selection mode switch, Power supply: through USB bus or from an external source.
- 8 General purpose input lines, 8 General purpose output lines, 16x2 LCD display, Interfacing keys.
- 3 high speed digital outputs and 2 High speed digital input lines. 6 PWM outputs, 3 QEI inputs.
- Analog inputs with level shifted to 1.65V for AC signal interface.

PMSM scalar controlled drive (V/f control)

- Motor Ratings: 36V, 4000 RPM
- 32 bit Digital Signal Controller (DSC) based v/f control in steps of 0.1 Hz
- Frequency range: 2 Hz to 50 Hz
- MATLAB interfacing
- SVPWM based control

PMSM sensed vector-controlled drive

- Motor ratings: 36V, 3000 RPM.
- 32 bit DSC based v/f control in steps of 0.1 Hz.
- Incremental encoder as speed & position sensor.
- Programmable and observable various quantities on DSO; Like, i_α , i_β , i_d , i_q etc...

Q-10



CP-717

- MATLAB interfacing .
- User configurable PI control parameters in a specified range.
- Loading arrangement for motor.
- Variable Frequency range: 2 Hz to 50 Hz
- Motor current/voltage signals available on front panel for observation on DSO
- Speed control loop timing: 20 ms
- Current loop timing: less than 1ms

Sensor less vector controlled PMSM drive

- Motor ratings: 36V, 4000 RPM
- 32 bit DSC based v/f control in steps of 0.1 Hz
- Programmable and observable various quantities on DSO; Like, i_α , i_β , i_d , i_q etc...
- MATLAB interfacing
- User configurable PI control parameters in a specified range.
- Loading arrangement for motor.
- Variable Frequency range: 2 Hz to 50 Hz.
- Motor current/voltage signals available on front panel for observation on DSO
- Speed control loop timing: 20 ms
- Current loop timing: less than 1ms
- EKF (Extended Kalman Filter) based sensor less algorithm

List of Experiments:

- To study gate pulse generation using rotor position sensor feedbacks.
- To study estimation of rotor angle using sensor signal.
- To study scalar (v/f) control of PMSM motor.
- To study vector control of PMSM motor using rotor position sensor feedbacks (sensored).
- To study Sensorless vector control of PMSM motor.
- To study the waveforms at an intermediate stage of control circuit (Clarke / Park Transformation, Rotor angle etc.)

- Set of experiment wise instruction working manual.
- On campus demonstration and training of lab staff.
- All components should be ISI mark and made by the reputed manufactures.
- Two years warranty.

Over



CP-716

7. Performance investigation of digitally and computerized controlled Four-quadrant operation of DC motor using 1-phase dual converter with analysis of circulating and non-circulating modes.

Electrical drive for studying single phase dual converter working in circulating and non-circulating mode using ARM Cortex M4 32-bit Microcontrollers

Trainer must have Following Features

- Provision to run Self-written program
- Model based programming
- MATLAB/C language coding support

Control Methods

- Circulating Current Mode of Operation
- Non-circulating Current Mode of Operation
- Open Loop and Closed Loop Control

Controller

- ARM Cortex M4 32 bit Microcontrollers
- Digital controller based on STM32F407VG microcontroller.
- High power thyristor bridge with Inductor
- Sensing circuits for DC current, DC voltage and speed

Technical Specifications: -

- ARM Cortex M4 32-bit microcontroller for programming (STM32F407VGT6 microcontroller featuring 32-bit ARM Cortex-M4F core)
- STM32F407VGT6 ARM Cortex-M4 Board featuring 32-bit ARM Cortex-M4F core, 168 MHz, 1 MB Flash, 192 KB RAM.
- On-board ST-LINK/V2 for programming and debugging with selection mode switch, Power supply: through USB bus or from an external source.
- On-board ADC, DAC, USB/JTAG terminal facility.
- Port pins routed to header on mother board for easy connection.
- 8 General purpose input lines, 8 General purpose output lines, 16x2 LCD display, interfacing keys.
- 3 high speed digital outputs and 2 High speed digital input lines. 6 PWM outputs, 3 QEI inputs.
- SPI bus for SPI slave interface, 9 Analog inputs, 2 Analog Universal outputs.
- RS232 interface through D-type connector.
- Input – 230V, 50 Hz single phase AC, Output – 220V DC suitable for 1.5 HP DC motor having proper heat dissipation arrangements.
- 800 V, 25 A thyristor rectifier with circulating inductor for AC-DC conversion.
- Provision to observe gate pulses and speed sensor outputs.
- Provision to operate in Open loop and closed loop speed control of motor.
- Sensing circuit for DC current.
- All connections terminated with banana connector.
- Over current protection.

Motor Setup requirements

Q. 14



CP-715

- 1.5 HP, 220V, 1500 rpm, DC Shunt Motor with spring balance load arrangement for loading
 - Essential speed and other sensors as per control and feedback requirement.
 - Computer and Programming Arrangement.
 - Complete arrangement with personal computer having minimum following configuration for programming the drive.
 - Intel Core-i3 (6th generation) 3.3 GHz processor, Mother Board - ASUS/GIGA-BITE or equivalent, RAM- 8 GB, Hard disk min.- 500 GB, DVD writer, Screen (18.5 Inch) LED display – LG or equivalent, with required essential accessories.
 - Facility for self-written C program as well as model-based programming.
 - MATLAB and C Language Coding support.
-
- Set of experiment wise instruction working manual.
 - On campus demonstration and training of lab staff
 - All components should be ISI mark and made by the reputed manufactures.
 - Two years warranty

Dr



FORMAT FOR PERFORMANCE BOND/GUARANTEE

(Undertaking from the supplier on a Non Judicial Stamp Paper of requisite duly attested by Notary) In consideration for "The Registrar, National Institute of Technology Jalandhar (hereinafter called NIT Jalandhar) having agreed to release the payment of net value as per terms and conditions of a concluded Order No. ___ dated ___ (hereinafter called 'the order') for supply of ___ (here in after called 'the Equipment /Item) to us Messrs ___ (hereinafter called 'the supplier') on submission of a Performance Bond to the satisfaction of NIT Jalandhar for the due performance of the said order.

We, Messer's _____ hereby submit the FDR/TDR No. _____ issued by _____ (Name of Bank) for _____ pledged in favour of Registrar, NIT Jalandhar as performance guarantee amount and hereby irrevocably, unconditionally and absolutely undertake against any loss or damage caused or suffered by NIT Jalandhar by reason of any failure of the supplier to perform or omission or negligence to perform any part of its obligations to the satisfaction of NIT Jalandhar in terms of the order.

We, the supplier, do hereby authorize Registrar, NIT Jalandhar to forfeit this Performance Guarantee amount / undertake to pay the amount due and payable under this guarantee without any demur merely on a demand from the NIT Jalandhar stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the NIT Jalandhar by reason of any breach by us of any of the terms and conditions contained in the said order or by reason of our failure or omission or negligence to perform the said order or any part thereof. We, the Supplier, undertake to pay to NIT Jalandhar any amount so demanded by NIT Jalandhar, notwithstanding:

- a) Any dispute or difference between NIT Jalandhar and supplier or any other person or between the supplier or any person or any suit or proceeding pending before any court or tribunal or arbitrator relating thereto; or
- b) The invalidity, irregularity or unenforceability of the order; or
- c) Any other circumstances which might otherwise constitute discharge of this guarantee, including any act of omission or commission on the part of NIT Jalandhar to enforce the obligations by the supplier or any other person for any reason whatsoever.

We, the Supplier, further agree that the performance Bond/ Guarantee herein contained shall be continued one and remain in full force and effect during the period that would be taken for the performance of the said order and that it shall continue to be enforceable till all the dues of the NIT Jalandhar under or by virtue of the said order have been fully paid and its claims satisfied or discharged or till the office of the Registrar, NIT Jalandhar certifies that terms and conditions of the said order have been fully and promptly carried out by us and accordingly discharges this Performance Bond/ Guarantee.

We, the Supplier, further agree with NIT Jalandhar, that NIT Jalandhar shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said order or to extend time of performance by the said supplier from time to time or to postpone for any time or from time to time and of the powers exercisable by the NIT Jalandhar against the said supplier and forbear or enforce any of the terms and conditions relating to the order and we shall not be relieved from our liability by reason of any such variation or extension being granted to us or for any forbearance, act or omission on the part of NIT Jalandhar or any indulgence by NIT Jalandhar to us or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

This Performance Bond/Guarantee will not be discharged due to the change in the constitution of the supplier. We, the Supplier, undertake not to revoke this Performance Bond / Guarantee except with the prior consent of NIT Jalandhar in writing.

The disputes relating to this Bank Performance Bond / Guarantee shall be resolved as per the terms and conditions of the order.



FORMAT FOR PERFORMANCE BOND (BANK GUARANTEE)

In consideration for the Registrar, National Institute of Technology Jalandhar, (*hereinafter called NIT Jalandhar*) having agreed to release the payment of net value as per terms and conditions of a concluded Order No. dated _____ (*hereinafter called 'the order'*) for supply of _____ (*hereinafter called 'the Equipment/Item'*) to Messrs _____ (*hereinafter called 'the supplier'*) on submission of a Bank Guarantee to the satisfaction of NIT Jalandhar for the due performance of the said order.

We, _____ (*hereinafter called 'the Bank'*) at the request of the supplier do, as a primary obliger and not merely as surety, hereby irrevocably, unconditionally and absolutely undertake against any loss or damage caused or suffered by NIT Jalandhar by reason of any failure of the supplier to perform or omission or negligence to perform any part of its obligations to the satisfaction of NIT Jalandhar in terms of the order.

We, the Bank do hereby undertake to pay the amount due and payable under this guarantee without any demurmerely on a demand from NIT Jalandhar stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by NIT Jalandhar by reason of any breach by the said supplier of any of the terms and conditions contained in a said order or any part thereof. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the bank under this guarantee, which shall not be considered as satisfied by any intermediate payment or satisfaction of any part of or obligation hereunder. However, our liability under this guarantee shall be restricted to an amount not exceeding _____.

We, the Bank, undertake to pay to NIT Jalandhar any amount so demanded by NIT Jalandhar, notwithstanding a). Any dispute and difference between NIT Jalandhar and supplier or any other person or between the supplier or any person or any suit or proceeding pending before any court or tribunal or arbitrator relating thereto or

a). The invalidity, irregularity or unenforceability of the order or

b). Any other circumstances which might otherwise constitute discharge of this guarantee, including any act of omission or commission on the part of NIT Jalandhar to enforce the obligations by the supplier or any other person for any reason whatsoever.

We, the Bank, further agree that the guarantee herein contained shall continue and remain in full force and effect during the period that would be taken for the performance of the said order and that it shall continue to be enforceable till all the dues of NIT Jalandhar under or by virtue of the said order have been fully paid and its claims satisfied or discharged or till the office of the Registrar, NIT Jalandhar confirms that the terms and conditions of the said order have been fully and promptly carried out by the said supplier and accordingly discharge this guarantee.

We, the Bank, hereby agree and undertake that any claim which the bank may have against the supplier shall be subject to and subordinate to the prior payment and performance in full of all the obligations of the bank hereunder and the bank will not, without prior written consent of NIT Jalandhar, exercise any legal rights or remedies of any kind in respect of any such payment or performance so long as the obligations of the bank hereunder remain owing and outstanding, regardless of the insolvency, liquidation or bankruptcy of the supplier or otherwise. We, the Bank, will not counter claim or set off against its liabilities to NIT Jalandhar hereunder any sum outstanding to the credit of NIT Jalandhar with it.

We, the Bank, further agree with NIT Jalandhar, that NIT Jalandhar shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said order or to extend time of performance by the said supplier from time to time or to postpone for any time or from time to time and of the powers exercisable by the NIT Jalandhar against the said supplier and forbear or enforce any of the terms and conditions relating to the order and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said supplier or for any forbearance, act or omission on the part of NIT Jalandhar or any indulgence by NIT Jalandhar to the said supplier or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

This guarantee will not be discharged due to the change in constitution of the Bank or the supplier.

We, the Bank, lastly undertake not to revoke this Guarantee during its currency except with the prior consent of NIT Jalandhar in writing.

The disputes relating to this Bank Guarantee shall be resolved as per the terms and conditions of the order.



FORMAT FOR MANUFACTURER'S AUTHORIZATION FORM

To,
The Registrar
Dr B. R Ambedkar National Institute of
Technology Jalandhar

Sub. : e-Tender for “ _____ ”.

Dear Sir,

We, _____, who are established and reputed manufacturers of _____, having factory/office at _____, hereby authorize M/s _____ [name & address of agents/distributors] to bid, negotiate and conclude the order with you for the above goods manufactured by us.

We shall remain responsible for the tender / Agreement negotiated by M/s _____, jointly and severally. No company or firm or individual other than M/s

_____ are authorized to bid, negotiate and conclude the order in regard to this business against this specific tender as for all business in the entire territory of India.

We hereby extend our full guarantee and warranty as per the terms and conditions of tender for the goods offered for supply against this invitation for bid by the above supplier.

****specify in detail manufacturer's responsibilities the services to be rendered by***

M/s _____ are as under:

- i) _____
- ii) _____

[Specify the services to be rendered by the agent/distributor] In case duties of the agent/distributor are changed or agent/ distributor is changed it shall be obligatory on us to automatically transfer all the duties and obligations to the new Indian Agent failing which we will ipso-facto become liable for all acts of commission or omission on the part of new Indian Agent/ distributor.

Yours faithfully,

[Name & Signature] For and on behalf of M/s. _____ [Name of manufacturer]



DECLARATION REGARDING BLACKLISTING / DEBARRING FOR TAKING PART IN TENDER

Self Attested

I / We _____ (Tenderer) hereby declare that the firm / agency namely M/s. _____ has not been blacklisted or debarred in the past by Union / State Government or organization from taking part in Government tenders in India.

Or

I / We _____ (Tenderer) hereby declare that the Firm / agency namely M/s. _____ was blacklisted or debarred by Union / State Government or any Organization from taking part in Government tenders for a period of

_____ years w.e.f. _____ to _____. The period is over on _____ and now the firm/company is entitled to take part in Government tenders.

In case the above information found false I / we are fully aware that the tender/ contract will be rejected / cancelled by Director, NIT Jalandhar, and EMD / SD shall be forfeited.

DEPONENT

Attested:

(Stamp of Company with authorized sign)

Name _____

Address _____



CERTIFICATE OF WARRANTY

- i). We certify that the warranty shall be for a period of _____ years for _____ and starting from the date of satisfactory installation, commissioning and handing over of the Equipment /Item and of the works conducted therewith covered under the supply order in working order. During the **warranty period, I/we shall provide free “after sale service” and the replacement of any part(s) of the Equipment /Item** or rectification of defects of work of the Equipment /Item will be free of cost. The replacement of the parts shall be arranged by us, at our own cost and responsibility. We undertake that the above warranty shall begin only from the date of satisfactory and faultless functioning of the Equipment /Item for 60 days at NIT Jalandhar premises. The benefit of change in dates of the warranty period shall be in the interest of the use/your organization.
- ii). During the warranty period, we shall provide at least _____ **preventive maintenance visits**.
- iii). Uptime Guarantee: During the warranty period, we will be responsible to maintain the Equipment /Item in good working conditions for a period 350 days (i.e. 95% uptime) in a block of 365 days.
- a). All complaints will be attended by us within 2 working days of receipt of the complaint in our office. b). In case there is delay of more than 2 days in attending to a complaint from our side then you can count the number of days in excess of the permissible response time in the downtime. The above said response time of 2 days for attending to a complaint by us will not be counted in the downtime.
- c). **Penalty:** We shall pay a penalty equivalent to **0.5 % of the FOB/CIF** value of the Equipment /Item for every week or part thereof delay in rectifying the defect.
- Note: The right to accept the reason (s) for delay and consider reduction or wave off the penalty for the same shall be at the sole discretion of Director, NIT Jalandhar**
- iv). We certify that the Equipment /Item being/ quoted is the latest model and that spares for the Equipment /Item will be available for a period of at least _____ years and we also guarantee that we will keep the organization informed of any update of the Equipment /Item over a period of _____ years.
- v). We guarantee that in case we fail to carry out the maintenance within the stipulated period, NIT Jalandhar reserves the right to get the maintenance work carried out at our risk, cost and responsibility after informing us. All the expenses including excess payment for repairs/maintenance shall be adjusted against the Performance Bank Guarantee. In case the expenses exceed the amount of Performance Bank Guarantee, the same shall be recoverable from us with/without interest in accordance with the circumstances.
- vi). We shall try to repair the Equipment /Item at NIT Jalandhar premises itself. However, the Equipment /Item will be taken to our site on our own expenses in case it is not possible to repair the same at NIT Jalandhar. We shall take the entire responsibility for the safe custody and transportation of the Equipment /Item taken out for repairs till the Equipment /Item is rehabilitated to the NIT Jalandhar after repair. Any loss of Equipment /Item or its accessories under its charge on account of theft, fire or any other reasons shall be at our sole risk and responsibility which will be compensated to NIT Jalandhar for such losses at the FOB/CIF value for the damaged/lost Equipment /Item part, including accessories.
- vii). We undertake to perform calibration after every major repair/breakdown/taking the Equipment /Item for repair out of NIT Jalandhar premises.
- viii). In case of extended warranty, we undertake to carry out annual calibration of the Equipment /Item.
- ix). We guarantee that we will supply spare parts if and when required on agreed basis for an agreed price. The agreed basis could be an agreed discount on the published catalogue price.
- x). We guarantee to the effect that before going out of production of spare parts, we will give adequate advance notice to you so that you may undertake to procure the balance of the life time requirements of spare parts.
- xi). We guarantee the entire unit against defects of manufacture, workmanship and poor quality of components.

Signature & Seal of the Manufacturer/Tenderer



SELF DECLARATION

[For Local Content of Products, Services or Works]

To,

The Director

Dr.B.R.Ambedkar NIT Jalandhar

1. With reference to Order No. P- 45021/2/2017-PP(BE-II) dated 16-09-2020 of DPIIT, Ministry of Commerce and Industry, Govt. of India, we fall under the following category of supplier (please tick the correct category) for the items for which this tender has been floated and being bided.

- Class I local supplier – has local content equal to more than 50%. Local contents added at _____(name of location).
- Class II local supplier – has local content more than 20% but less than 50%. Local contents added at _____(name of location).
- Non-local supplier – has local content less than or equal to 20%. Local contents added at _____ (name of location).

2. We are solely responsible for the abovementioned declaration in respect of category of supplier. False declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which we may can be debarred for up to 2 years as per Rule 151(iii) of the General Financial Rules along with such other actions as may be permissible under law.

Signature & seal of the company

Name and address of the organization

.....
.....
.....

Note: In cases of procurement for a value in excess of Rs. 10 crores, the 'Class-I local supplier' / 'Class-II local supplier' shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.