

# **TENDER DOCUMENTS**

**Electrical Lab Equipment** 

NUTECH / SCM / Electrical Lab Eqpt (Ph-V) 2020 / TD-172

**NATIONAL UNIVERSITY OF TECHNOLOGY** 

#### TENDER NOTICE

# National University of Technology (NUTECH) NUTECH / SCM / Civil Lab Eqpt (Ph-V) 2020 / TD-171, NUTECH / SCM / Electrical Lab Eqpt (Ph-V) 2020 / TD-172 & NUTECH / SCM / Projector for MCR (PSDP) 2020 / TD-176,

- 1. Sealed bids are invited from Government / FBR Registered Firms for the procurement of Lab Equipment for NUTECH on **FOR Basis**.
- 2 Tender documents containing terms, conditions and detailed specifications of items (including draft contract) can be downloaded from NUTECH website "<a href="https://nutech.edu.pk/downloads/procurement/scm-tenders/">https://nutech.edu.pk/downloads/procurement/scm-tenders/</a>" w.e.f **26 September 2020**.
- 3. Quotations shall be submitted as per requirement of the tender documents.
- 4. Bidders will be required to submit **Bank Draft / CDR** equal to **5%** of quoted value as Bid Bond in favor of National University of Technology (NUTECH).
- 5. Submit Rs 1500/- as Tender fee in favor of NUTECH HBL Account (**NUTECH Tendering and Contracts**, **5037-7000210755**). Please attach bank receipt with technical offer. Offers will not be entertained without payment of processing fee.
- 6. Details for Submission & Opening of bids for each tender are as under:-

Ser	Description	Submission	Tender Opening	Completion Days
a.	Civil Lab Equipment (TD-171)	1030 hrs on 14 October 2020	1100 hrs on 14 October 2020	120 Days
b.	Electrical Lab Equipment (TD-172)	1100 hrs on 14 October 2020	1130 hrs on 14 October 2020	120 Days
C.	Projector for MCR (TD-176)	1030 hrs on 15 October 2020	1100 hrs on 15 October 2020	30 Days

<u>Deputy Director (Supply Chain Management)</u>

<u>NATIONAL UNIVERSITY OFTECHNOLOGY, IJPROAD,I-12,ISLAMABAD</u>

<u>Tel: 0092-51-5476768, Ext: 178</u>

# NATIONAL UNIVERSITY OF TECHNOLOGY SUPPLY CHAIN MANAGEMENT INVITATION TO TENDER

Tender submission time: 1100 hours, 14 October 2020

- 1. NUTECH desires to procure the list of item(s) / Store(s) on <u>FOR</u> <u>b a s i s</u>. as per <u>Annexure-A</u>. Interested bidders are requested to send their bids through courier or deliver at NUTECH under "<u>Single Stage Two Envelopes</u>" (two <u>envelopes placed together in third envelope</u>), marked clearly as "<u>Technical Offer</u>" respectively to the undersigned, latest by or before above mentioned due date.
- 2 <u>Conditions Governing Contracts.</u> The contract made as result of this IT will be in accordance with the draft contract published on NUTECH University website and other special conditions (Mentioned in this document) that may be added to given contract for the supply of Lab Equipment.
- 3. **Delivery of Tender.** The offer is to be submitted as under:
  - a Technical Offer. Technical Offer should contain only Annexure-A, Annexure-A-1 & Annexure B duly filled in (supported with relevant technical literature / details / catalogues etc) and receipt of tender processing fee. Copy of bid bond WITHOUT MENTIONING PRICE should be attached with technical offer. Only relevant technical details i.e literature/brochures) without mentioning the financial aspect of the offer in DUPLICATE should be enclosed in an envelope. In technical proposal, all items must have the brand names, model number, manufacturer's name, country of origin, manufacturer's warranty including parts with complete specs and brochures. Re-conditioned and re-furbished equipment shall not be acceptable. Following information will be clearly marked on the envelope:
    - (1) Technical Offer
    - (2) Original Performa Invoice (without price)
    - (3) Tender number
    - (4) Date/ time of opening
  - b. <u>Commercial Offer.</u> Commercial Offer will contain Annexure-C and bid bond (Dully mentioned and placed in separate envelope. The offer indicating the quoted price FE/Local Currency (in Local Currency for FOR cases & in FE for FOB cases) in figures as well as in words

would be enclosed in an envelope. Following information will be clearly marked on the envelope;

- (1) Commercial Offer
- (2) Original Performa invoice with price
- (3) Tender number
- c. Both the envelopes i.e. commercial offer and technical offer would be enclosed in yet another properly sealed envelope that will be marked with address of this office only. There should be clear indication that this envelope contains tender documents.
- d. The tender duly sealed will be addressed to the following:-

Deputy Director (Supply Chain Management Office)

NATIONAL UNIVERSITY OF TECHNOLOGY (NUTECH)

IJ P ROAD, I-12, ISLAMABAD

Tel: 0092-51-5476768, Ext: 227

- 4. **Date and Time for Receipt of Tender.** Sealed bids with detailed specifications should reach SCM office latest by **1100 hours on 14 October 2020.** Delay occurring in post shall not be accepted. Tenders received after the appointed / fixed time will NOT be entertained. The appointed time will, however, fall on next working day in case of closed / forced holiday.
- 5. <u>Tender opening.</u> The offers shall be opened **30 minutes** after submission time. Commercial offers will be opened at later stage if Technical Offer is found acceptable on examination by technical authorities. Date and time for opening of commercial offer shall intimated later. Only legitimate / registered representatives of firm will be allowed to attend tender opening.
- 6. <u>Validity of Offer.</u> The validity period of quotations must be indicated and should be **90 days** from the date of opening of financial offer.
- 7. **With drawal of offer** If the firm withdraws its offer within validity period the competent authority may place such firm under <u>embargo for a period</u>, <u>which may be extended up to one year. Moreover, the Earnest Money of the firm will be confiscated.</u>
- 8. **Documents.** Following information / copy of documents must be provided / attached with offer:
  - a. A copy of letter showing firm's financial capability.
  - b. NTN/GST number be mentioned on the offer and copy of registration Certificate issued by Sales Tax Department, attached.

- **c.** Foreign supplier to provide its Registration Number issued by respective Department of Commerce authorizing export of subject stores (in FOB cases).
- d. Annexes A, A-1, B and C and special conditions must be signed and stamped. ATTACH ONLY RELEVANT DOCUMENTS.
- e. Complete all Annexes as per given format. Do not use your format or letter head. Offer may be rejected if given format is not followed.
- f. OEM/principal agency agreement must be provided.

#### 9. **Disqualification.** Offers are liable to be rejected if:-

- a. Validity of offer is not quoted as required in IT documents.
- b. Any deviation from the General/ Special / Technical Instructions.
- c. Offers are found conditional or incomplete in any respect.
- d. Copy of EM/Bid Bond & Tender processing fee (with tech offer) and original EM/Bid Bond (with fin offer) are NOT attached.
- e. Multiple rates/items are quoted against one item.
- f. Manufacturer's relevant brochures and technical details on major equipment assemblies are not attached in support of specifications.
- g. Offer received later than appointed / fixed date and time.
- h. Subject to restriction of export license.
- i Offers (Commercial / technical) containing non-initialled / unauthenticated amendments / corrections / overwriting. If the validity of the agency agreement has expired. The commercial offer against FOB / CIF / C&F tender quoted in local currency.
- j. If the offer is found to be based on cartel action in connivance with other sources/participants of the tender.
- 10. **Earnest Money / Bid Bond.** Commercial Offer must be accompanied with a Bid Bond (CDR/Pay Order/Bank Draft) in agreement of faithful compliance of the conditions of Contract. This amount will be equivalent to 5% of the total quoted value. The Bid Bond amount submitted by the successful bidder will however be refunded on effective termination of Contract. (The Bid Bond will be forfeited in case of default by the bidder from his commitments made through his offer). Submission of Bid Bond is mandatory; otherwise your offer will be rejected. Bid Bond will be used as performance guarantee till the delivery of stores, otherwise separate performance guarantee valued at 5 % of contract will be submitted by successful firm till stores are delivered and inspected.

#### 11. Return of Earnest Money/Bid Bond.

- a. Bid Bond to the unsuccessful bidders will be returned on finalization of the lowest evaluated bidder.
- b. Bid Bond of the successful bidder/bidders will be returned on submission of Bank Guarantee/Bid bond against warranty period OR Bid bond retained for the warranty period as the case may be.

#### 12 <u>Terms of Payment/ LC Charges</u>

#### (In FOB cases)

a. All categories payment will be made through letter of credit (LC). LC opening charges in Pakistan are to be borne by NUTECH. Payment will be made through irrevocable LC in favour of Manufacturer.

#### In FOR cases

- b. 20% advance payment will be made to the Seller on provision of unconditional Bank Guarantee/ CDR/ DD/ Pay order. Advance BG/CDR/DD/Pay order will be submitted at the time of signing the contract.
- c. 80% payment will made to the Seller after receipt and confirming the correctness of ordered specifications, installation, commissioning OR as the case may be i.e through Inland LC.
- 13. <u>Warranty/ Bank Guarantee (BG)</u>. 2 Years against 5% Bank Guarantee/CDR/Pay Order/Bank Draft of the store value will be required from the successful bidders from the date of commissioning as performance bond. BG submitted shall remain valid for up to 60 days beyond completion of warranty period.
- 14. <u>Taxes/ Duties/ Custom clearance</u> All taxes /duties /import Licenses Fee as applicable under government laws in Pakistan as well as country of supplier shall be on Seller (in FOR Case). NUTECH will provide applicable exemption certificates and documents (In FOB Cases only).
- 15. <u>Insurance:</u> Insurance will be NUTECH's responsibility through NICL (in FOB Cases).
- 16. <u>Freight charges /Misc charges:</u> All charges such as packing, forwarding, local freight, loading and unloading, installation and commissioning, custom clearance, orientations, on job training or any other will be part of quoted price. Delivery till NUTECH will be seller's responsibility and all associated costs will be part of quotation as well.

- 17. <u>Delivery Schedule.</u> Store will be delivered within **120 days** from contract signing date.
- 18. <u>Force Majeure.</u> If non-compliance with the period of delivery or services can be proved to be due to Force Majeure, such as but not limited to mobilization, war, riot, strike, lockout, pandemics/epidemics or the occurrence of unforeseen events, the period shall be reasonably extended.
- 19. **Subletting** Suppliers are not allowed to sublet wholly or part of the contract to any other firm /company without prior permission by NUTECH. Firm found in breach of the clause will be dealt with as per purchaser's right and discretion.

#### 20. <u>Arbitration.</u> Will be as under:-

"All Claims ,disputes ,controversies, differences arising out of or in connection with this contract ,including any question regarding its existence, validity, interpretation performance, breach or termination ,shall be referred to and shall finally be solved by binding arbitration. An Arbitration Committee Shall be constituted comprising Rector NUTECH and two Arbitration to be nominated on mutual agreement by each party. The venue of the Arbitration shall be the place of issuance of this contract or as Rector NUTECH may determine. In case of any difference, the clauses of Arbitration Act 1940, Rules and Regulation made thereof for time being enforce shall prevail. The award shall be final and binding on both parties.

- a. Provided that written record of any such arbitration and its award shall be arranged properly. An award of such arbitration may be confirmed in a court of competent jurisdiction at Islamabad.
- b. Provided further that incase of any other question /dispute not covered under this clause, the decision of Rector NUTECH shall be final."
- 21. **Redress Of Grievance.** In case of dispute, case shall be reviewed by 'NUTECH Redress of grievance committee and decision of NUTECH shall be final and binding on both parties.
- Export License/Permit /End User Cert. It shall be the responsibility of the Supplier to obtain from the Government concerned all permits and export licenses, etc required to enable each consignment to be shipped immediately as per the delivery schedule. In case the supplier fails to arrange export license within 30 days of signing the contract the purchaser reserves the right to cancel the contract on the risk and expense of the supplier without prior notice. The purchaser will provide End User Certificate for acquisition of export license to the supplier (format to be provided)

by the supplier for respective country within 10 day of signing of the contract).

- 23. <u>Technical Specification:</u> The supplier will provide OEM certificate, quality certificate /inspection document to the purchaser confirming the quality of the product being supplied under this contract .Store must bear the manufacturer's identification marking /monogram.
- 24. <u>Inspection /Testing of Store</u>: Inspection testing will be carried out at NUTECH by the concerned inspection team as detailed by the respective department in accordance with the laid down Acceptance Criteria. (Acceptance Test Procedure (ATPs)/Drawing /Test standard and specification). The supplier will provide ATPs with technical offer. Mutually agreed/approved ATPs will form part of contract to govern the inspection of store subsequently.
- 25. <u>Change In Specification / Mfr / Model.</u> No alternation marked/brand and quality of store will be entertained after the tender have been opened.
- 26. Checking of Store at Consignee/User End. All stores will be checked at Consignee's end in the presence of the supplier's representative. If for some reason, the supplier decides not to nominate his representative for such checking, an advance written notice to this effect will be given by the supplier to the consignee prior to immediately on shipment of store. In such an event the supplier will clearly undertake that decision of consignee with regard to quantities and description of consignment will be taken as final and discrepancy found will be accordingly made up by supplier. In all other cases the consignee will inform the supplier about arrival of consignment immediately on receipt of store through registered email/letter and telephone. If no response from the supplier is received within 15 days from initiation letter the consignee will have the right to proceed with the checking without supplier's representative. User/Consignee's report on checking of the stores will be binding on the seller in such cases.
- 27. Packing /Marking. The supplier shall be responsible for proper packing of the Store in standard export packing worthy of transportation by sea /air /road rail so as to ensure their content being free from lose or damages due to faulty packing on arrival at the ultimate destination. Packing of stores will be done at the expenses of the supplier. All packing cases, containers and other packing material shall become the property of the NUTECH on receipt. Any loss occurred /demurrage paid due to wrong marking will be made good by the supplier.

- 28. **Original Performa Invoice**: Original Performa invoice must have following components incorporated:
  - a. HS Code
  - b. Incoterm
  - c. Payment Terms
  - d. Origin of good
  - e. Port of shipment
  - f. Address of OEM
  - g. Seller acceptance (on Performa Invoice)
  - h. Invoice Date
  - Latest date of shipment
  - Seller complete bank detail

**Note:** Performa Invoice in the name of NUTECH in case of FOB cases & in the name of local partner in case of FOR cases.

#### 29. **General Instructions:** Following must be noted:-

- a. The firm should provide point to point acceptance of each clause of IT and special instructions attached with IT.
- b. Firm will render a certificate with technical offer that firm is neither defaulter nor blacklisted by any Government / semi Government organization directly or indirectly. (On Judicial Paper)
- c. Rates should be quoted on Free Delivery basis at NUTECH Islamabad.
- d. The stipulated delivery period should be strictly adhered to. Any anticipated delay that is beyond the control of Seller will be informed (in writing) well in advance of the expiry of the due date of the activity along with reasons thereof, requesting for the grant of extension in delivery period. If the Seller fails to do so, or the Buyer is not convinced with the rationale provided by the Seller, Liquidated Damages up to/at 2% per month or part thereof, will be imposed. However, the maximum limit of the Liquidated Damages will not exceed 10% of the delayed store value.
- e. If even after applicability of 10% LD, the Seller fails to deliver the required stores, the Buyer will be at liberty to Cancel the contract, and /or procure the stores from an alternate source, on the Seller's "Risk & Cost/Expense". In that case, the Seller will be bound to make payment to the new source through NUTECH. The purchaser's

- decision under this clause shall NOT be subjected to arbitration.
- f. NUTECH reserves the right to cancel the Contract without assigning any reason whatsoever during its currency / execution / after placement, if the firm is found to be involved in any dubious activity, litigation, lacking to meet contractual obligations with the purchaser or is blacklisted with any other Public procurement agency. No claims / loss /damage of whatsoever nature shall be entertained and NUTECH's decision in this regard will be final / binding on the Seller.
- g. An appropriate amount may be paid for mobilization against Bank Guarantee/CDR/Demand Draft/Pay Order.
- h. Firms with previous pending/outstanding projects/business and unsatisfactory performance with NUTECH may not be considered for award of any further business.

Deputy Director
Supply Chain Management Office

### Annex-A

# **Technical Specifications**

NUTECH / SCM / Electrical Lab Eqpt (Ph-V) 2020 / TD-172

Ser	Part No	Items	Description	Country of Origin	A/U	Qty Req	Bidde Comp	r liance	Tech So to be by u	e done
							Yes	No	Accepted	
									Reason of	Rejection
1		Programmable Logic	The Trainer consists of PLCs module,	_	No	10				
		Control	power supply, programming, operating							
		Trainer (Siemen	software and Programming cable.							
		Based)	Features:							
			Power Supplies Installed							
			Analog Source Included							
			Input Switches Installed							
			Interface Headers Installed							
			Technical Features:							
			PLC: Siemens CPU 1215C							
			Digital Outputs: 10							
			<b>Analog Inputs</b> : 2 X Voltage Type with 11-bit ADC							
			<b>Analog Outputs:</b> 2X Voltage Type & Current Type							
			Simultaneous Output							
			Programming Language: Ladder, STL & FBD							
			Analog Voltage Source: 2 X +/- 10V							
			Fixed Supply DC: 24V, 12V & 5V							
			Interface Connector: 40-pin IDC							
			Digital Input Simulator: 8X Momentary, 8X							
			Toggle							
			Switches							
			Accessories: 2mm Patch Cords, Power Cord,							
			Experiment Manual, IDC Cable, PC							
			Programming Cable, Software CD							
			Experimental Capabilities:							
			Implementation of Logic Gates							

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		Implementation of Counters(Parking Stand) Implementation of Timer Application (Flash Light) Study of PLC Analog Input Implement Digital to Analog Converter  The equipment should have below mentioned modules  OR Equivalent					
1A	Traffic Light Control By PLC	Technical Features: Round About: Red, Yellow & Green Lamps Right Turn: Red, Green Lamps Digital Output from PLC: 8X Interface Connector: 40-pin IDC Compatible PLC Trainer: Mentioned above Accessories: User Manual, IDC Cable, Sample Program Experiments Included: Introduction, Types of Traffic Lights Traffic Light Control using PLC  OR Equivalent	Any	No	10		
1B	Water Level Control By PLC	Features: Control Circuits Installed Drivers Installed Protection Circuits Installed Technical Features: Input to PLC: 5X Level, 2X Output Valves Output from PLC: 2X Pump Drives Analog Output from PLC: To Drive Level Indicators Interface Connector: 40-pin IDC Compatible PLC Trainer: Mentioned above Accessories: User Manual, IDC Cable, Sample	Any	No	10		

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		Program				
		Experiments Included:				
		Introduction, Operation				
		Water Level Control using PLC				
		OR Equivalent				
1C	Temperature Control	Features:	Any	No	10	
	By PLC	Sensors installed on-board	_			
		Control Circuits Installed				
		Drivers Installed				
		Protection Circuits Installed				
		Technical Features:				
		Heater: 4X 47R 5W Resistor Type				
		Fan: 12 VDC				
		3 ½-Digit Digital Voltmeter: LCD Type				
		3 ½-Digit Digital Ammeter: LCD Type				
		Analog Input to PLC: 1X Voltage, 1X Current				
		Type				
		Output Signals from PLC: 2X Fan ON/OFF,				
		2X				
		Heater ON/OFF				
		Temperature Sensor: 2X IC Type				
		Interface Connector: 40-pin IDC				
		Compatible PLC Trainer: Mentioned Above				
		Accessories: User Manual, IDC Cable,				
		Sample				
		Program, 2mm Patch Cords				
		Experiments Included:				
		Introduction, Control Loops				
		Temperature Control using PLC				
		Temperature Control using 1 LC				
		OR Equivalent				
1D	Conveyor Control By	Features:	Any	No	10	
	PLC	Sensors installed on-board	•			
		Control Circuits Installed				
		Drivers Installed				
		Protection Circuits Installed				
		Technical Features:				
 	<u> </u>			1	1	

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		Conveyor Belt: 205mm					
		Sensors: IR, Proximity					
		Motor: DC Gear Motor					
		Indicator: LED, Buzzer					
		Control: Auto / Manual, Forward / Reverse					
		Digital Inputs to PLC: IR, Proximity,					
		Auto/Manual & Process Reset					
		Digital Outputs from PLC: Forward, Reverse,					
		LED, Buzzer					
		Interface Connector: 40-pin IDC					
		Compatible PLC Trainer: Siemens IT-1200S					
		Accessories: User Manual, IDC Cable,					
		Sample					
		•					
		Program					
		Experiments Included:					
		Introduction, Types of Conveyor Belts					
		Conveyor Belt: 205mm					
		Conveyor Control using PLC					
		OR Equivalent					
1E	Elevator Control By	Features:	Any	No	10		
	PLC	Control Circuits Installed	,				
		Drivers Installed					
		Protection Circuits Installed					
		Technical Features:					
		Elevator: 3-Floor					
		Floor Indicator: 7-Segment LED Display					
		Call Switch: Momentary Tact Type					
		Call Indicator: LEDs					
		Elevator Direction Indicator: LEDs					
		Elevator Door Indicator: 8X8 Dual Colour Dot					
		Matrix					
		Digital Inputs to PLC: 3XCall Switches,					
		3XInternal Panel Floor Switch					
		Digital O/P from PLC: 2XFloor Indicator,					
		3XDoor Indicator, UP, DOWN, 3XCall Switch					
		Indicator					

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							 Page <b>15</b> of <b>40</b>
	-		Interface Connector: 40-pin IDC				
			Compatible PLC Trainer: Siemens IT-1200S				
			Accessories: User Manual, IDC Cable,				
			Sample				
			Program				
			Experiments Included:				
			Introduction, Types of Elevators				
			Elevator Control using PLC				
			OR Equivalent				
1	1F	Motor Control By PLC	•	Any	No	10	
	••	motor control by I Lo	Sensors installed on-board	Ally	110	.0	
			Control Circuits Installed				
			Drivers Installed				
			Protection Circuits Installed				
			Technical Features:				
			Motor: DC Motor, Stepper Motor & R/C Servo				
			Motor				
			Encoder: IR Opto-interrupter, 4XDigital Hall				
			Driver: Monolithic Dual H-Bridge				
			Signal Conditioning: PWM Generator, F/V				
			Converter				
			Interface Connector: 40-pin IDC, 2mm				
			Input/Output				
			Compatible PLC Trainer: Mentioned Above				
			Accessories: User Manual, IDC Cable,				
			Sample				
			Program, 2mm Patch Cords				
			Experiments Included:				
			Introduction, DC Motor Control using PLC				
			Stepper Motor Control using PLC				
			R/C Servo Motor Control using PLC				
			OR Equivalent				
1	1G	Electro-Pneumatic	Features:	Any	No	10	
		Conveyor	Sensors installed on-board	•			
		Control By PLC	Control Circuits Installed				
			Drivers Installed				

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		Protection Circuits Installed					
		Technical Features:					
		Motor: DC Motor, Stepper Motor & R/C Servo					
		Motor					
		Encoder: IR Opto-interrupter, 4XDigital Hall					
		Driver: Monolithic Dual H-Bridge					
		<b>Signal Conditioning:</b> PWM Generator, F/V Converter					
		Interface Connector: 40-pin IDC, 2mm					
		Input/Output					
		Compatible PLC Trainer: Mentioned Above					
		Accessories: User Manual, IDC Cable,					
		Sample					
		Program, 2mm Patch Cords					
		Experiments Included:					
		Introduction, DC Motor Control using PLC					
		Stepper Motor Control using PLC					
		R/C Servo Motor Control using PLC					
		OR Equivalent					
1H	Robot Control Module		Any	No	10		
	By PLC	The robot module is used to transport pieces in					
		a circular area. It includes a cylinder for					
		up/down movements, another cylinder for the					
		forward/backward movements, a suction cup					
		for holding the piece, and a motor with encoder					
		coupled to a reducer for the operations of					
		coupled to a reducer for the operations of rotation.					
		coupled to a reducer for the operations of rotation.  The robot's movements are clearly identified by					
		coupled to a reducer for the operations of rotation. The robot's movements are clearly identified by the REED sensors, for the movement of					
		coupled to a reducer for the operations of rotation.  The robot's movements are clearly identified by the REED sensors, for the movement of cylinders and by the inductive sensor for the					
		coupled to a reducer for the operations of rotation. The robot's movements are clearly identified by the REED sensors, for the movement of					
		coupled to a reducer for the operations of rotation.  The robot's movements are clearly identified by the REED sensors, for the movement of cylinders and by the inductive sensor for the					
		coupled to a reducer for the operations of rotation.  The robot's movements are clearly identified by the REED sensors, for the movement of cylinders and by the inductive sensor for the rotation.					
		coupled to a reducer for the operations of rotation. The robot's movements are clearly identified by the REED sensors, for the movement of cylinders and by the inductive sensor for the rotation.  Technical Features:					
		coupled to a reducer for the operations of rotation. The robot's movements are clearly identified by the REED sensors, for the movement of cylinders and by the inductive sensor for the rotation.  Technical Features: Sensors and actuators:					

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		4 REED sensors  Module I/O: 7 Digital inputs 5 Digital outputs  Experiments Included: Principles of electro-pneumatics Operation of vacuum circuit coupled to a suction cup Operation of the electro-valves Operation of REED and inductive sensors						
1			_					
11	Module for Testing Selecting Pieces Control By PLC	Features: The module is used to test and select pieces and it has been designed to work with the module of conveyor belt module. It consists of two cylinders for the selection of pieces and two sensors: an inductive sensor enables to identify the material (plastic/metal); whereas another optic reflection sensor is used to identify the color (white/black).  Technical Features: Sensors and actuators: 1 Inductive sensor 1 Optic reflection sensor 2 3/2 electro-valves  Module I/O: 2 Digital inputs 2 Digital outputs  Experiments Included: Principles of electro-pneumatics Operation of pneumatic cylinders Operation of optic reflection sensors  Operation of optic reflection sensors	Any	No	10			
1		∪K Equivalent		1				
	11	Selecting Pieces Control By	Module I/O: 7 Digital inputs 5 Digital outputs Experiments Included: Principles of electro-pneumatics Operation of vacuum circuit coupled to a suction cup Operation of the electro-valves Operation of REED and inductive sensors  OR Equivalent Features: The module is used to test and select pieces and it has been designed to work with the module of conveyor belt module. It consists of two cylinders for the selection of pieces and two sensors: an inductive sensor enables to identify the material (plastic/metal); whereas another optic reflection sensor is used to identify the color (white/black). Technical Features: Sensors and actuators: 1 Inductive sensor 1 Optic reflection sensor 2 3/2 electro-valves Module I/O: 2 Digital inputs 2 Digital outputs Experiments Included: Principles of electro-pneumatics Operation of pneumatic cylinders Operation of inductive sensors	Module I/O: 7 Digital inputs 5 Digital outputs Experiments Included: Principles of electro-pneumatics Operation of vacuum circuit coupled to a suction cup Operation of the electro-valves Operation of REED and inductive sensors  OR Equivalent  Features: The module is used to test and select pieces and it has been designed to work with the module of conveyor belt module. It consists of two cylinders for the selection of pieces and two sensors: an inductive sensor enables to identify the material (plastic/metal); whereas another optic reflection sensor is used to identify the color (white/black).  Technical Features: Sensors and actuators: 1 Inductive sensor 1 Optic reflection sensor 2 3/2 electro-valves Module I/O: 2 Digital inputs 2 Digital outputs Experiments Included: Principles of electro-pneumatics Operation of pneumatic cylinders Operation of optic reflection sensors	Module I/O: 7 Digital inputs 5 Digital outputs Experiments Included: Principles of electro-pneumatics Operation of vacuum circuit coupled to a suction cup Operation of the electro-valves Operation of REED and inductive sensors  OR Equivalent  Features: The module is used to test and select pieces and the module of conveyor belt module. It consists of two cylinders for the selection of pieces and two sensors: an inductive sensor enables to identify the material (plastic/metal); whereas another optic reflection sensor is used to identify the color (white/black). Technical Features: Sensors and actuators: 1 Inductive sensor 1 Optic reflection sensor 2 3/2 electro-valves Module I/O: 2 Digital inputs 2 Digital outputs Experiments Included: Principles of electro-pneumatics Operation of pneumatic cylinders Operation of optic reflection sensors Operation of optic reflection sensors	Module I/O: 7 Digital inputs 5 Digital outputs Experiments Included: Principles of electro-pneumatics Operation of vacuum circuit coupled to a suction cup Operation of the electro-valves Operation of REED and inductive sensors  OR Equivalent  Features: The module is used to test and select pieces and it has been designed to work with the module of conveyor belt module. It consists of two cylinders for the selection of pieces and two sensors: an inductive sensor enables to identify the material (plastic/metal); whereas another optic reflection sensor is used to identify the color (white/black). 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Technical Features: Sensors and actuators: 1 Inductive sensor 1 Optic reflection sensor 2 3/2 electro-valves Module I/O: 2 Digital inputs 2 Digital inputs 2 Digital outputs Experiments Included: Principles of electro-pneumatics Operation of poetic reflection sensors Operation of optic reflection sensors Operation of optic reflection sensors	Module I/O: 7 Digital inputs 5 Digital outputs Experiments Included: Principles of electro-pneumatics Operation of vacuum circuit coupled to a suction cup Operation of the electro-valves Operation of REED and inductive sensors  OR Equivalent Features: The module is used to test and select pieces and it has been designed to work with the module of conveyor belt module. It consists of two cylinders for the selection of pieces and two sensors: an inductive sensor enables to identify the material (plastic/metal); whereas another optic reflection sensor is used to identify the color (white/black). Technical Features: Sensors and actuators: 1 Inductive sensor 1 Optic reflection sensor 2 3/2 electro-valves Module I/O: 2 Digital inputs 2 Digital inputs 2 Digital outputs Experiments Included: Principles of electro-pneumatics Operation of pneumatic cylinders Operation of pneumatic cylinders Operation of optic reflection sensors Operation of optic reflection sensors Operation of optic reflection sensors

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1J	Weight Control	Features:	Any	No	10	1.91.11.11	_
	Module By PLC	The module IT-5109 is used to weigh pieces. The					
	FLO	sensor included in this equipment enables to					
		carry					
		out measurements on objects of variable					
		weight					
		(from 0.1 to 4 kg) generating an analog output					
		Signal ranging between 0 and 10 V.					
		Technical Features:					
		Sensors and actuators:					
		Weight sensor					
		Module I/O:					
		1 Analog output					
		Experiments Included:					
		Principles of electronics					
		Operation of weight sensors					
		OR Equivalent					
1K	Storage Control	Features:	Any	No	10		
	Module for	The module is used to distribute prismatic					
	Prismatic Pieces By	pieces. It has been designed to work with the					
	PLC	module of conveyor belt. Pieces are expelled					
		by a double acting cylinder controlled by a 5/2-					
		way solenoid valve. The presence of pieces in the column is detected by a micro-switch					
		sensor, whereas the position of the cylinder is					
		detected by two REED sensors.					
		Technical Features:					
		Sensors and actuators:					
		1 Micro-switch sensor					
		2 REED sensors					
		1 5/2 electro-valve					
		Module I/O:					
		3 Digital inputs					
		2 Digital outputs					
		Experiments Included:					
		Principles of electro-pneumatics					

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						 raye 13 01 41
		Operation of micro-switch sensors				
		Operation of REED sensors				
		OR Equivalent				
1L	Conveyor Belt Contro	ol Features:	Any	No	10	
	Module	The module has been designed to enable the	_			
	By PLC	linear pieces transportation along one axis, in				
		the two directions. The conveyor is driven by a				
		bidirectional DC motor that provides the				
		movement of the belt.				
		Technical Features:				
		Sensors and actuators:				
		1 Fiber optical sensor				
		1 DC motor 24 VDC				
		Module I/O:				
		1 Digital inputs				
		2 Digital outputs				
		Experiments Included:				
		Principles of electrical control of DC motor				
		The conveyor operation				
		The fiber optical sensor				
		·				
		OR Equivalent				
1 M	HMI (Touch Screen	Features:	Any	No	10	
	Module)	Power Supply Installed				
		Communication Port Installed				
		Programming Port Installed				
		Technical Features:				
		Display:				
		Display: 7" TFT LCD				
		Resolution: 800x480				
		Brightness: 300				
		Contrast Ratio: 500:1				
		Backlight Type: LED				
		Backlight Life Time: >30,000hrs				
		Colors: 16M				
		LCD Viewing Angle (T/B/L/R): 70/50/70/70				
		Touch Panel:				

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Nype: 4-wire resistive type Accuracy: Active area length (x) 2%, width(Y) + +2% Memory: Flash: 128MB RAM: 128MB Processor: 328lts RISC Cortex-A8 600MHz I/O Port: USB Host: USB 2.0x1 USB Client: N/A Ethernet: 10/100 Base-T x 1 COM Port: COM1: RS-232, COM2: RS-485 2W/4W  OR Equivalent  ■ Minimum Frequency Range ≤ 5 kHz ■ Maximum Frequency Range ≥3 GHz with tracking generator ■ Frequency upgradable via keycode, ■ Max RI Input approx. +30dBm ■ DANL (norm to 1 Hz) 1 GHz ■ RBW Range approx. 1 Hz to 3 MHz ■ RBW Range approx. 1 Hz to 3 MHz ■ Must have Independent Signal Source The equipment must include following accessories and software options with licenses  ■ Modulation Analysis (AM, FM, ASK, FSK) (UN) ■ Vector Network Analysis (UN) ■ RF cable 50 Ohm; N(m) to N(m); DC- 18GHz, 610mm(24inch) ■ Calibration Kit N (female)	Accuracy: Active area length (x) 2%, width(Y) + +2% Memory: Flash: 128MB RAM: 128MB Processor: 32Bits RISC Cortex-A8 600MHz I/O Port: USB Host: USB 2.0x1 USB Client: N/A Ethernet: 10/100 Base-T x 1 COM Port: COM1: RS-232, COM2: RS-485 2W/4W OR Equivalent  • Minimum Frequency Range ≤ 5 kHz • Maximum Frequency Range ≥ 3 GHz with tracking generator • Frequency uggradable via keycode, • Max RF Input approx. +30dBm • DANL (norm to 1 Hz) 1 GHz • Must have Independent Signal Source The equipment must include following accessories and software options with licenses  • Modulation Analysis (AM, FM, ASK, FSK) (UN) • Vector Network Analysis (UN) • RF cable 50 Ohm; N(m) to N(m); DC- 18GHz, 610mm(24inch) • Calibration Kit N (female)							 Page <b>20</b> or	70
<ul> <li>Spectrum Analyzer</li> <li>Minimum Frequency Range ≤ 5 kHz</li> <li>Maximum Frequency Range ≥ 3 GHz with tracking generator</li> <li>Frequency upgradable via keycode,</li> <li>Max RF Input approx. +30dBm</li> <li>DANL (norm to 1 Hz) 1 GHz</li> <li>RBW Range approx. 1 Hz to 3 MHz</li> <li>Must have Independent Signal Source</li> <li>The equipment must include following accessories and software options with licenses</li> <li>Modulation Analysis (AM, FM, ASK, FSK) (UN)</li> <li>Vector Network Analysis (UN)</li> <li>RF cable 50 Ohm; N(m) to N(m); DC-18GHz, 610mm(24inch)</li> </ul>	<ul> <li>Spectrum Analyzer</li> <li>Minimum Frequency Range ≤ 5 kHz</li> <li>Maximum Frequency Range ≥3 GHz with tracking generator</li> <li>Frequency upgradable via keycode,</li> <li>Max RF Input approx. +30dBm</li> <li>DANL (norm to 1 Hz) 1 GHz</li> <li>RBW Range approx. 1 Hz to 3 MHz</li> <li>Must have Independent Signal Source</li> <li>The equipment must include following accessories and software options with licenses</li> <li>Modulation Analysis (AM, FM, ASK, FSK) (UN)</li> <li>Vector Network Analysis (UN)</li> <li>RF cable 50 Ohm; N(m) to N(m); DC-18GHz, 610mm(24inch)</li> <li>Calibration Kit N (female)</li> </ul>			Accuracy: Active area length (x) 2%, width(Y) + +2%  Memory: Flash: 128MB  RAM: 128MB  Processor: 32Bits RISC Cortex-A8 600MHz  I/O Port: USB Host: USB 2.0x1  USB Client: N/A  Ethernet: 10/100 Base-T x 1  COM Port: COM1: RS-232, COM2: RS-485  2W/4W					
OR Equivalent		2	Spectrum Analyzer	<ul> <li>Minimum Frequency Range ≤ 5 kHz</li> <li>Maximum Frequency Range ≥3 GHz with tracking generator</li> <li>Frequency upgradable via keycode,</li> <li>Max RF Input approx. +30dBm</li> <li>DANL (norm to 1 Hz) 1 GHz</li> <li>RBW Range approx. 1 Hz to 3 MHz</li> <li>Must have Independent Signal Source</li> <li>The equipment must include following accessories and software options with licenses</li> <li>Modulation Analysis (AM, FM, ASK, FSK) (UN)</li> <li>Vector Network Analysis (UN)</li> <li>RF cable 50 Ohm; N(m) to N(m); DC-18GHz, 610mm(24inch)</li> <li>Calibration Kit N (female)</li> </ul>	EUROPE	NO	1		

# **Special Instructions**

Description	Bid	der	Tech Scrutiny	to be done	by User
	Yes	N	Accepted	Rejected	Reasons
		0			of Rejection
Environment Conditions					rtojoution
(a) Temperature range: 05°C to +60°C					
(b) Relative humidity: 0-70% non-condensing					
Warranty period As per IT Clause 13.					
Training Notes Supplier will provide a set of handouts for training on					
operation and maintenance of the equipment					
Publications Supplier is to provide hard and soft copies (CD) of following					
manuals.					
(a) Operational / Maintenance manual: - Qty 01 with Equipment and					
additional Qty 02 for record purposes and should consist of following sections:-					
(1)Equipment Description /Operation:-					
(a)Specifications					
(b)Description					
(c)Operation					
(2)Servicing:-					
(a)Maintenance Schedule					
(b )Adjustment / test					
(c)Removal / Installation procedure					
(d)Tools Used					
(3) Trouble shooting guide					
(4) Cleaning requirements					
(5) Shipping and receiving					
(6) Storage requirements					
(b) IPB (Illustrated Parts Breakdown Manual) should have full parts description					
along with detailed diagrams (exploded view).					
(c) <b>Experimental manuals</b> which must contain the list and procedure of the					
experiments that equipment can perform.					
Spares / Technical Support					
(a) Supplier to have in-country spares / technical support and ensure spares and					

		. a.g. == ae					
technical support / assistance for next 10 years							
(b) Comprehensive list of spares required for scheduled maintenance of							
Equipment is to be provided							
(c) Any software provided must have its license							
(d) Software upgrade support must be provided free of cost for 10 x years with							
renewed license at every upgrade							
(e) Supplier must also provide calibration service for at least 5 x years after							
commissioning							
Additional Spare / Replaceable parts.							
(a) Replaceable spare / parts during scheduled inspections are to be							
identified and provided as per requirement along with equipment sufficient							
to cater five years consumption. (b) All specialized / standard tools required for inspection / repair /							
servicing must be supplied along with equipment.							
Physical Inspection Criteria: 100% physical inspection of store will be carried							
out before commissioning of the equipment for following details:-							
<ul><li>(a) For physical damage, scratches and deformity.</li></ul>							
(b) Accessories /components as per contractual specifications.							
(c) Technical Manuals (Operation manual, user guide, IPBs).							
(d) Quality certificate and calibration certificate by the OEM							
(e) OEM certificate and verifiable documents by the supplier that store							
has been procured from certified source and is factory new and from							
latest production.							
(f) Brand name and country of origin.							
Commissioning							
(a) Commissioning of the equipment will be carried out by OEM rep at							
his own cost and risk at designated place at NUTECH.							
(b) Any special requirement for installation, operation and							
commissioning must be specified in the offer by the supplier.  Local Training Required:							
01 week OEM operational/ maintenance training at NUTECH.							
Improvement and Safety Measures: Any improvement and safety measures							
suggested by NUTECH during commissioning are to be resolved by the supplier /							

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manufacturer at no extra cost.			
Liability of Supplier			
(a) OEM certificate of authorized dealership Supplier is to provide			
original OEM certificate of subject equipment bought directly from the			
manufacturer and being an authorized dealer.			
(b) Incase the equipment supplied is not compatible with specifications,			
the supplier will be obliged to call his representatives at his own cost for			
consultation and corrective action			
Special Notes			
(a) Additional requirements for the maintenance of equipment (if any)			
must be intimated by the supplier in technical offer.			
(b) Supplier must provide the list of organizations using same			
equipment in Pakistan (if any).			
(c) Equipment must be a standard product of OEM available at web			
address of OEM.			
(d) In case of premature failure of the equipment, OEM has to replace /			
rectify the item free of cost. Required transportation charges would be			
borne by the supplier.			

Firm Name	
Signature	
Name	
Designation	

# **TECHNICAL OFFER**

# NUTECH / SCM / Electrical Lab Eqpt (Ph-V) 2020 / TD-172

<u>Fill i</u>	<u>in following essential paran</u>	<u>neters</u> :-		
1.	Validity of Offer:	Days (Should not be less than <b>120</b>	days)	
2.	Delivery period:	Days (After placement of order)		
3.	Country of Origin:			
4.	Warranty Period:			
<u>Ger</u>	<u>neral</u>			
1.	GST Number:	(Enclose Copy)		
2.	NTN / CNIC:	(if exempted, provide valid exemp	tion certificate)	
<u>Pay</u>	ment Terms (In continuation	on of IT Document clause 12)		
In	FOR Cases			
20	% advance payment against	BG/CDR/Pay Order/DD		
80	% payment after delivery, ins	stallation / commissioning /user satisfaction	n certificate	
<u>Deta</u>	ails of Foreign Principal Inf	ormation with account details)		
1.	Name / Title:			
2.	Address:			
OEM	1 Name:	Firm Name:	Signature:	
OEM	1 Focal Person:	Firm Focal Person:	Official Seal:	
OEM	1 Phone Number:	Firm Phone Number:	Name & CNIC:	
OEM	1 Email Id:	Firm Email Id:	Designation:	

# Annex C

# FINANCIAL OFFER NUTECH / SCM / Electrical Lab Egpt (Ph-V) 2020 / TD-172

Ser	Part No	Item Name/Size	Specification	A/U	Qty Req	Unit Price PKR (Including Tax)	Total Price PKR (Including Tax)
1		Programmable Logic Control Trainer (Siemen Based)	The Trainer consists of PLCs module, power supply, programming, operating software and Programming cable.  Features: Power Supplies Installed Analog Source Included Input Switches Installed Interface Headers Installed Technical Features: PLC: Siemens CPU 1215C Digital Outputs: 10 Analog Inputs: 2 X Voltage Type with 11-bit ADC Analog Outputs: 2X Voltage Type & Current Type Simultaneous Output Programming Language: Ladder, STL & FBD Analog Voltage Source: 2 X +/- 10V Fixed Supply DC: 24V, 12V & 5V Interface Connector: 40-pin IDC Digital Input Simulator: 8X Momentary, 8X Toggle Switches Accessories: 2mm Patch Cords, Power Cord, Experiment Manual, IDC Cable, PC Programming Cable, Software CD Experimental Capabilities: Implementation of Logic Gates Implementation of Counters(Parking Stand) Implementation of Timer Application (Flash Light) Study of PLC Analog Input Implement Digital to Analog Converter	No	10		

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	1				Pag	e 26 of 40
		The equipment should have below mentioned modules				
		OR Equivalent				
4.0	Troffic Limbt	Tackwinel Factures	Na	40		
1A	Traffic Light	Technical Features:	No	10		
	Control By PLC	Round About: Red, Yellow & Green Lamps				
		Right Turn: Red, Green Lamps				
		Digital Output from PLC: 8X				
		Interface Connector: 40-pin IDC				
		Compatible PLC Trainer: Mentioned above				
		Accessories: User Manual, IDC Cable, Sample				
		Program  Formation and Analysis also				
		Experiments Included:				
		Introduction, Types of Traffic Lights				
		Traffic Light Control using PLC				
		OR Equivalent				
1B	Water Level	Features:	No	10		
ID	Control By PLC	Control Circuits Installed	NO	10		
	Control by FEC	Drivers Installed				
		Protection Circuits Installed				
		Technical Features:				
		Input to PLC: 5X Level, 2X Output Valves				
		Output from PLC: 2X Pump Drives				
		Analog Output from PLC: To Drive Level				
		Indicators				
		Interface Connector: 40-pin IDC				
		Compatible PLC Trainer: Mentioned above				
		Accessories: User Manual, IDC Cable, Sample				
		Program				
		Experiments Included:				
		Introduction, Operation				
		Water Level Control using PLC				
		OR Equivalent				
1C	Temperature	Features:	No	10		
	Control By PLC	Sensors installed on-board				
		Control Circuits Installed				

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					1 age 21 01 40
		Drivers Installed			
		Protection Circuits Installed			
		Technical Features:			
		Heater: 4X 47R 5W Resistor Type			
		Fan: 12 VDC			
		3 ½-Digit Digital Voltmeter: LCD Type			
		3 ½-Digit Digital Ammeter: LCD Type			
		Analog Input to PLC: 1X Voltage, 1X Current			
		Туре			
		Output Signals from PLC: 2X Fan ON/OFF, 2X			
		Heater ON/OFF			
		Temperature Sensor: 2X IC Type			
		Interface Connector: 40-pin IDC			
		Compatible PLC Trainer: Mentioned Above			
		Accessories: User Manual, IDC Cable, Sample			
		Program, 2mm Patch Cords			
		Experiments Included:			
		Introduction, Control Loops			
		Temperature Control using PLC			
		OR Equivalent			
1D	Conveyor	Features:	No	10	
	Control By PLC	Sensors installed on-board			
		Control Circuits Installed			
		Drivers Installed			
		Protection Circuits Installed			
		Technical Features:			
		Conveyor Belt: 205mm			
		Sensors: IR, Proximity			
		Motor: DC Gear Motor			
		Indicator: LED, Buzzer			
		Control: Auto / Manual, Forward / Reverse			
		Digital Inputs to PLC: IR, Proximity,			
		Auto/Manual & Process Reset			
		Digital Outputs from PLC: Forward, Reverse,			
		LED, Buzzer			
		Interface Connector: 40-pin IDC			
		Compatible PLC Trainer: Siemens IT-1200S			

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					Pa	age <b>28</b> of <b>40</b>
		Accessories: User Manual, IDC Cable, Sample Program				
		Experiments Included: Introduction, Types of Conveyor Belts Conveyor Belt: 205mm				
		Conveyor Control using PLC				
		OR Equivalent				
1E	Elevator Control By PLC	Control Circuits Installed Drivers Installed Protection Circuits Installed Technical Features: Elevator: 3-Floor Floor Indicator: 7-Segment LED Display Call Switch: Momentary Tact Type Call Indicator: LEDs Elevator Direction Indicator: LEDs Elevator Door Indicator: 8X8 Dual Colour Dot Matrix Digital Inputs to PLC: 3XCall Switches, 3XInternal Panel Floor Switch Digital O/P from PLC: 2XFloor Indicator, 3XDoor Indicator, UP, DOWN, 3XCall Switch Indicator Interface Connector: 40-pin IDC Compatible PLC Trainer: Siemens IT-1200S Accessories: User Manual, IDC Cable, Sample Program Experiments Included: Introduction, Types of Elevators Elevator Control using PLC  OR Equivalent	No	10		
1F	Motor Control By		No	10		
''	PLC	Sensors installed on-board		'0		
		Control Circuits Installed				

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						Page 29 01 40
		Drivers Installed				
		Protection Circuits Installed				
		Technical Features:				
		Motor: DC Motor, Stepper Motor & R/C Servo Motor				
		Encoder: IR Opto-interrupter, 4XDigital Hall				
		Driver: Monolithic Dual H-Bridge				
		Signal Conditioning: PWM Generator, F/V				
		Converter				
		Interface Connector: 40-pin IDC, 2mm				
		Input/Output				
		Compatible PLC Trainer: Mentioned Above				
		Accessories: User Manual, IDC Cable, Sample				
		Program, 2mm Patch Cords				
		Experiments Included:				
		Introduction, DC Motor Control using PLC				
		Stepper Motor Control using PLC				
		R/C Servo Motor Control using PLC				
		OR Equivalent				
1G	Electro-	Features:	No	10		
	Pneumatic	Sensors installed on-board				
	Conveyor	Control Circuits Installed				
	Control By PLC	Drivers Installed				
		Protection Circuits Installed				
		Technical Features:				
		Motor: DC Motor, Stepper Motor & R/C Servo				
		Motor				
		Encoder: IR Opto-interrupter, 4XDigital Hall				
		Driver: Monolithic Dual H-Bridge				
		Signal Conditioning: PWM Generator, F/V				
		Converter				
		Interface Connector: 40-pin IDC, 2mm				
		Input/Output				
		Compatible PLC Trainer: Mentioned Above				
		Accessories: User Manual, IDC Cable, Sample				
		Program, 2mm Patch Cords				
				1	I	1
		Experiments Included: Introduction, DC Motor Control using PLC				

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		,			rage 30 of 40
		Stepper Motor Control using PLC			
		R/C Servo Motor Control using PLC			
		OR Equivalent			
1H	Robot Control	Features:	No	10	
	Module By PLC	The robot module is used to transport pieces in a circular area. It			
		includes a cylinder for up/down movements, another cylinder for the			
		forward/backward movements, a suction cup for holding the piece,			
		and a motor with encoder coupled to a reducer for the operations of			
		rotation.			
		The robot's movements are clearly identified by the REED sensors, for			
		the movement of cylinders and by the inductive sensor for the rotation.			
		Technical Features:			
		Sensors and actuators:			
		1 Motor of 24 V DC with encoder			
		3 5/2 monostable electro-valves			
		1 Inductive sensor			
		4 REED sensors			
		Module I/O:			
		7 Digital inputs			
		5 Digital outputs			
		Experiments Included:			
		Principles of electro-pneumatics			
		Operation of vacuum circuit coupled to a			
		suction cup			
		Operation of the electro-valves			
		Operation of REED and inductive sensors			
		OR Equivalent			
11	Module for	Features:	No	10	
	Testing	The module is used to test and select pieces and it has been designed			
	Selecting	to work with the module of conveyor belt module. It consists of two			
	Pieces Control	cylinders for the selection of pieces and two			
	By PLC	sensors: an inductive sensor enables to identify			
		the material (plastic/metal); whereas another			
		optic reflection sensor is used to identify the color (white/black).			
		Technical Features:			

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	 				 rage 31 01 40
1	Weight Control	Sensors and actuators:  1 Inductive sensor  1 Optic reflection sensor  2 3/2 electro-valves  Module I/O:  2 Digital inputs  2 Digital outputs  Experiments Included:  Principles of electro-pneumatics  Operation of pneumatic cylinders  Operation of inductive sensors  Operation of optic reflection sensors  OR Equivalent  Features:	No	10	Tage 31 of 40
	Module By PLC	The module IT-5109 is used to weigh pieces. The sensor included in this equipment enables to carry out measurements on objects of variable weight (from 0.1 to 4 kg) generating an analog output Signal ranging between 0 and 10 V.  Technical Features: Sensors and actuators: Weight sensor Module I/O: 1 Analog output Experiments Included: Principles of electronics Operation of weight sensors  OR Equivalent			
1	Storage Control Module for			10	

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 	1				1 age 32 01 40
		Sensors and actuators:  1 Micro-switch sensor  2 REED sensors  1 5/2 electro-valve  Module I/O:  3 Digital inputs  2 Digital outputs  Experiments Included:  Principles of electro-pneumatics  Operation of micro-switch sensors  Operation of REED sensors			
		OR Equivalent			
1L	Conveyor Belt Control Module By PLC	Features: The module has been designed to enable the linear pieces transportation along one axis, in the two directions. The conveyor is driven by a bidirectional DC motor that provides the movement of the belt.  Technical Features: Sensors and actuators: 1 Fiber optical sensor 1 DC motor 24 VDC  Module I/O: 1 Digital inputs 2 Digital outputs  Experiments Included: Principles of electrical control of DC motor The conveyor operation The fiber optical sensor	No	10	
		OR Equivalent			
1 M	HMI (Touch Screen Module)	Features: Power Supply Installed Communication Port Installed Programming Port Installed Technical Features: Display: Display: 7" TFT LCD	No	10	

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				Faye 33 OF	+∪
Resolution: 800x480 Brightness: 300 Contrast Ratio: 500:1 Backlight Type: LED Backlight Life Time: >30,000hrs Colors: 16M LCD Viewing Angle (T/B/L/R): 70/50/70/70 Touch Panel: type: 4-wire resistive type Accuracy: Active area length (x) 2%, width(Y) + +2% Memory: Flash: 128MB RAM: 128MB Processor: 32Bits RISC Cortex-A8 600MHz I/O Port: USB Host: USB 2.0x1 USB Client: N/A Ethernet: 10/100 Base-T x 1				rage 33 Of	40
<ul> <li>Minimum Frequency Range ≤ 5 kHz</li> <li>Maximum Frequency Range ≥3 GHz with tracking generator</li> <li>Frequency upgradable via keycode,</li> <li>Max RF Input approx. +30dBm</li> <li>DANL (norm to 1 Hz) 1 GHz</li> <li>RBW Range approx. 1 Hz to 3 MHz</li> <li>Must have Independent Signal Source</li> <li>The equipment must include following accessories and software options with licenses</li> <li>Modulation Analysis (AM, FM, ASK, FSK) (UN)</li> <li>Vector Network Analysis (UN)</li> </ul>	NO	1			
	Brightness: 300 Contrast Ratio: 500:1 Backlight Type: LED Backlight Life Time: >30,000hrs Colors: 16M LCD Viewing Angle (T/B/L/R): 70/50/70/70 Touch Panel: type: 4-wire resistive type Accuracy: Active area length (x) 2%, width(Y) + +2% Memory: Flash: 128MB RAM: 128MB Processor: 32Bits RISC Cortex-A8 600MHz I/O Port: USB Host: USB 2.0x1 USB Client: N/A Ethernet: 10/100 Base-T x 1 COM Port: COM1: RS-232, COM2: RS-485 2W/4W OR Equivalent  ■ Minimum Frequency Range ≤ 5 kHz ■ Maximum Frequency Range ≤ 3 GHz with tracking generator ■ Frequency upgradable via keycode, ■ Max RF Input approx. +30dBm ■ DANL (norm to 1 Hz) 1 GHz ■ RBW Range approx. 1 Hz to 3 MHz ■ Must have Independent Signal Source  The equipment must include following accessories and software options with licenses ■ Modulation Analysis (AM, FM, ASK, FSK) (UN)	Brightness: 300 Contrast Ratio: 500:1 Backlight Life Time: >30,000hrs Colors: 16M LCD Viewing Angle (T/B/L/R): 70/50/70/70 Touch Panel: type: 4-wire resistive type Accuracy: Active area length (x) 2%, width(Y) + +2% Memory: Flash: 128MB RAM: 128MB Processor: 32Bits RISC Cortex-A8 600MHz I/O Port: USB Host: USB 2.0x1 USB Client: N/A Ethernet: 10/100 Base-T x 1 COM Port: COM1: RS-232, COM2: RS-485 2W/WW OR Equivalent  • Minimum Frequency Range ≤ 5 kHz • Maximum Frequency Range ≥3 GHz with tracking generator • Frequency upgradable via keycode, • Max RF Input approx. +30dBm • DANL (norm to 1 Hz) 1 GHz • RBW Range approx. 1 Hz to 3 MHz • Must have Independent Signal Source  The equipment must include following accessories and software options with licenses  • Modulation Analysis (AM, FM, ASK, FSK) (UN) • Vector Network Analysis (UN)	Brightness: 300 Contrast Ratio: 500:1 Backlight Type: LED Backlight Life Time: >30,000hrs Colors: 16M LCD Viewing Angle (T/B/L/R): 70/50/70/70 Touch Panel: type: 4-wire resistive type Accuracy: Active area length (x) 2%, width(Y) + +2% Memory: Flash: 128MB RAM: 128MB Processor: 32Bits RISC Cortex-A8 600MHz I/O Port: USB Host: USB 2.0x1 USB Client: N/A Ethernet: 10/100 Base-T x 1 COM Port: COM1: RS-232, COM2: RS-485 2W/4W OR Equivalent  • Minimum Frequency Range ≤ 5 kHz • Maximum Frequency Range ≥3 GHz with tracking generator • Frequency upgradable via keycode, • Max RF Input approx. +30dBm • DANL (norm to 1 Hz) 1 GHz • RBW Range approx. 1 Hz to 3 MHz • Must have Independent Signal Source  The equipment must include following accessories and software options with licenses  • Modulation Analysis (AM, FM, ASK, FSK) (UN) • Vector Network Analysis (UN)	Brightness: 300 Contrast Ratio: 500:1 Backlight Type: LED Backlight Life Time: >30,000hrs Colors: 16M LCD Viewing Angle (T/B/L/R): 70/50/70/70 Touch Panel: type: 4-wire resistive type Accuracy: Active area length (x) 2%, width(Y) + +2% Memory: Flash: 128MB RAM: 128MB RAM: 128MB Processor: 32Bits RISC Cortex-A8 600MHz I/O Port: USB Host: USB 2.0x1 USB Client: N/A Ethernet: 10/100 Base-T x 1 COM Port: COM1: RS-232, COM2: RS-485 2W/4W OR Equivalent  • Minimum Frequency Range ≤ 5 kHz • Maximum Frequency Range ≥3 GHz with tracking generator • Frequency upgradable via keycode, • Max RF Input approx. +30dBm • DANL (norm to 1 Hz) 1 GHz • RBW Range approx. 1 Hz to 3 MHz • Must have Independent Signal Source  The equipment must include following accessories and software options with licenses  • Modulation Analysis (AM, FM, ASK, FSK) (UN) • Vector Network Analysis (UN)	Resolution: 800x480 Brightness: 300 Contrast Ratio: 500:1 Backlight Life Time: >30,000hrs Colors: 16M LCD Viewing Angle (T/B/L/R): 70/50/70/70 Touch Panel: type: 4-wire resistive type Accuracy: Active area length (x) 2%, width(Y) + +2% Memory: Flash: 128MB RAM: 128MB Processor: 32Bits RISC Cortex-A8 600MHz I/O Port: USB Host: USB 2.0x1 USB Client: N/A Ethernet: 10/100 Base-T x 1 COM Port: COM1: RS-232, COM2: RS-485 2W/4W OR Equivalent  Minimum Frequency Range ≤ 5 kHz Maximum Frequency Range ≤ 3 GHz with tracking generator Frequency upgradable via keycode, Max RF Input approx. +30dBm DANL (norm to 1 Hz) 1 GHz RBW Range approx. 1 Hz to 3 MHz Must have Independent Signal Source  The equipment must include following accessories and software options with licenses  Modulation Analysis (AM, FM, ASK, FSK) (UN) Vector Network Analysis (UN)

Calibration Kit N (female)

OR Equivalent

Total

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OR Equivalent

Firm Nam	e:
Signature	:
Name:	
Designation	on:

Tender No	
Name of the Firm	
Firm Address	
Date	
Telephone No	
E-Mail	

To,

DD SCM Office NUTECH University I-12, Main IJP Road, Islamabad.

#### Dear Sir

- 1. I / We hereby offer to supply to the NUTECH University the stores detailed in schedule to the tender inquiry or such portion thereof as you may specify in the acceptance of tender at the price offered against the said schedule and further agree that this offer will remain valid up to 90 days after opening of Financial offer and will not be withdrawn or altered in terms of rates quoted and the conditions already stated therein or on before this date. I / we shall be bound by a communication of acceptance to be dispatched within he prescribed time.
- 2. I / we have understood the instructions to Tenders and General Conditions Governing Contract available at NUTECH website and have thoroughly examined the specifications / drawing and / or patterns quoted in the schedule here to and am/are fully aware of the nature of the stores required and my/ our offer is to supply stores strictly in accordance with the requirements.

Yours Faithfully.

(Signature of Tenderer)

Designation

Date:

Individual signing tender and / or other documents connected with a contract must be signed by principal authorized rep/ OEM rep/ Authorized partner firm rep.

# SPECIMEN FOR "ADVANCE PAYMENT BANK GUARANTEE"

Guarantee No:Date Amount: Valid upto:				
In Favour of:				
National University of Technology (NUTECH), IJP Road, I-12, Islamabad				
Subject: Advance Payment Bank Guarantee				
Contract No:DATED				
Dear Sir,				
1. We [Name of Guarantor] understand that you have entered into contract with M/S [Name of Fi	irm]			
(hereinafter called Our Client), for provision of [Name of Stores]. And as per the above mention	ned			
Contract, you are liable to pay to Our Client an amount of [Amount of Guarantee] in advance, wh	nich			
shall be released against a Bank Guarantee. 2. Bank & seller firm shall inform your office regard	ling			
termination of the validity of this bank Guarantee one clear month before the actual expiry date of	this			
Bank Guarantee.				
3. Now, we hereby irrevocably undertake to immediately make payment on to your orders, me	rely			
upon receipt of your first written notice, an amount not exceeding [Amount of Guarantee] that may	be			
claimed by you at your own discretion without it being necessary for you to prove or even assert to	the			
Bank any default whatsoever of Our Client under the Contract.				
4. Claims against this Guarantee shall be lodged on us through written request/s on your pro	per			
Letter Head. Unless claims are not presented on or before the Validity Date, all rights and benefits				
under this guarantee shall be forfeited and we shall be released from all claims, demands or liabili	ties			
of any kind whatsoever.				
5. This Guarantee shall remain in force up to the above mentioned Validity Date which can howe	ver,			
be extended upon request of Our Client.				
Yours faithfully,				
Signature:				
Name:				
Designation:				

Bank Stamp:

"SPECIMEN FOR BANK GUARANTEE AGAINST PERFORMANCE/WARRANTY GUARANTEE"				
Guarantee No:	Date	Amount:	Valid upto:	
In Favour of: National University of Technology (NUTECH), IJP Road, I-12, Islamabad				
Subject: In compliance with terms of Performance/Warranty Guarantee Bank Guarantee				
Contract No:		dated		
Dear Sir,				

- 1. Whereas your good-self have entered into Contract No\_\_ dated\_with M/s [Firm Name] Located at [Firm Address], Herein after referred to as our customer and that one of the conditions of the Contract is submission of Bank Guarantee by our customer to your good-self for a sum of [Amount].
- 2. Incompliance with this stipulation of subj contract, we hereby agree and undertake as under:
  - a. To pay to you unconditionally on demand and / or without any reference to our Customer an amount not exceeding the sum of [Amount] as would be mentioned in your written Demand Notice.
  - b. To keep this Guarantee in force till [Validity Date].
  - c. That the validity of this Bank guarantee shall be kept two clear year ahead of the original / extended delivery period or the warrantee of the stores which so ever is later in duration on receipt of information from your office. Our liability under this Bank Guarantee shall cease on the closing of banking hours on the last date of validity of this Bank Guarantee. Claim received there after shall not been entertained by us whether you suffer a loss or not. On receipt of payment under this Guarantee, this documents i.e., Bank Guarantee must be clearly cancelled, discharged and returned to us.
  - d. That we shall inform your office regarding termination of the validity of this bank Guarantee on clear month before the actual expiry date of this Bank Guarantee.

  - f. That the bank guarantee herein before given shall not be affected by any change in the constitution of the Bank or Customer / Supplier or Vendor.

g.	That this is an unconditional Bank guarantee, which shall been cashed on sight
	on presentation without any reference to our Customer / Supplier or Vendor.

Signature	
Name	_
Desig	_
Bank Stamp	

Note: No changes in the above given BG format shall be accepted.

#### "SELLER'S WARRANTY CERTIFICATE"

(To be provided on stamp paper)

Contract No:	Dated:
	vears from the date of final acceptance of the Stores. arantee that we are the genuine and original Source of provisioning the Stores to our
Buyer. We also	undertake that nothing in the manufacturing of these Stores has been obtained
through unauth	orized means.
1. We	e hereby warrant and undertake that the Stores and all the associated
spares/ are:	accessories supplied under the terms and conditions of the above Contract,
arc.	
a.	brand new, complete in all respects, possessing good quality and standard workmanship; and
b.	liable for replacement/rectification free of charge, if during the Warranty period the same are found defective before or under normal use or these do
	not remain within the limits and tolerances stated under the specifications or in any way not in accordance with the terms of this Contract. All expenses
	incurred in removal, re-provisioning and reinstallation of such defective Stores or their parts shall also be borne by us.
2. Th	e Warranty shall remain valid for a period of years from the date of final
accepta	nce of the Stores.
	Signature & Stamp
	Cignature & Stamp
	Name & CNIC
	Designation: ————————————————————————————————————

<sup>\*\*</sup>Sellers warranty must be provided by the Seller (firm) on Rs 100 stamp paper along with bank guarantee/CDR/Pay Order without changing a word. BG with additional clauses will be rejected.

Date\_\_\_\_\_

Signature of Firm Auth Signatory

### **CHECK LIST**

# (This checked list must be attached with your technical offer, duly filled and

#### Signed by authorized signatory)

Note: Fill and/or mark Yes/No where required

Tender No\_\_\_\_\_

1	Tender Processing	a. Tender processing fee ref no		
	Fee	b. Bank		-
		c. Amount		
2	EM/ Bid Bond	a. EM/ Bid Bond ref no	a. EM/ Bid Bond ref no	
		b. Bank		_
3	Form Annex A, A-1,	B and C signed by Authorized	Yes	No
	Signatory			
4	Offering specification of items as per IT		Yes	No
5	Quoted Currency as per IT		Yes	No
6	Accounting unit/Qty as per IT		Yes	No
7	Delivery Schedule as per IT		Yes	No
8	, 5			
9	Name of OEM:			
10	0 Original Performa invoice (Mandatory) Yo		Yes	No
11	Certified that there is no Deviation from IT conditions/     Yes		No	
	there is deviation from IT condition as per fol details			
12	2 Blacklisting certificate.		Yes	No
13	3 Verifiable OEM Certificate		Yes	No
14	4 Warranty Period as per IT		Yes	No
15	15 ATPs provided Yo			No