

Package Code: TEQIP-III/2019/SLIE/38

Current Date: 25-Jul-2019

Package Name: Centre for Training and Research in Automation

Method: NCB Goods

Sant Longowal Institute of Engineering and Technology, Longowal

BID REFERENCE NO: TEQIP-III/2019/SLIE/38

**NATIONAL COMPETITIVE BIDDING
FOR
PROCUREMENT OF EQUIPMENT**

**UNDER
TECHNICAL EDUCATION QUALITY IMPROVEMENT PROGRAMME PHASE III
(TEQIP III)**

**(A WORLD BANK ASSISTED PROJECT)
CREDIT NO. - CR. 5874-0 IN**

NATIONAL COMPETITIVE BIDDING FOR
Establishing Centre for Training and Research in Automation

Bid Reference:	TEQIP-III/2019/SLIE/38
Date of Commencement of Sale of Bidding Document:	Date: 25-Jul-2019 Time: 10:00 hrs.
Last date for Sale of Bidding Document:	Date: 26-Aug-2019 Time: 14:30 hrs.
Bid Security Amount (In INR):	Rs: 200000
Pre-Bid Meeting Date and Time:	Date: 07-Aug-2019 Time: 11:00
Last date and time for Receipt of Bids:	Date: 26-Aug-2019 Time: 14:30 hrs.
Time and Date of Opening of Bids:	Date: 26-Aug-2019 Time: 15:30 hrs.
Place of Opening of Bids:	Department of Electrical and Instrumentation Engineering SLIET Longowal – 148106 (Punjab)
Address for Communication:	TEQIP-III Office, Mechanical Engineering Block, Sant Longowal Institute of Engineering & Technology, Longowal - 148106 Punjab, India
Contact Details: (Queries should be sent to the Email ID only, the subject heading: “Setting up of Industry Linked Centre for Training and Research in Automation”)	Prof. A.S. Arora Department of Electrical and Instrumentation Engineering SLIET Longowal – 148106 (Punjab) Phone No. 01672 253240, 94632 17074 ajatsliet@yahoo.com

SECTION I: INVITATION FOR BIDS (IFB)

SECTION I. INVITATION FOR BIDS (IFB)

Date : 23-Jul-2019
Credit No. : Cr. 5874-0 IN
IFB No. : TEQIP-III/2019/SLIE/38

1.	The Government of India has received a Credit (Cr. 5874-0 IN) from the International Development Association in various currencies towards the cost of project Technical Education Quality Improvement Programme [TEQIP]-Phase III (TEQIP III) and it is intended that part of the proceeds of this credit will be applied to eligible payments under the contracts for which this Invitation for Bids is issued.
2.	The Director, Sant Longowal Institute of Engineering and Technology now invites sealed bids from eligible bidders for Establishing Centre for Training and Research in Automation listed below:
3.	Interested eligible Bidders may obtain further information from and inspect the bidding documents at the office of TEQIP-III, Mechanical Engineering Block, Sant Longowal Institute of Engineering and Technology, Punjab, India
4.	A complete set of bidding documents may be purchased by any interested eligible bidder on the submission of a written application to the above office and upon payment of a non-refundable fee as indicated below in the form of a Demand Draft in favour of Director SLIET Longowal , payable at Longowal .
5.	The provisions in the Instructions to Bidders and in the General Conditions of contract (GCC) are based on the provisions of the World Bank Standard Bidding Document - Procurement of Goods.
6.	The bidding document may be obtained from the office of Sant Longowal Institute of Engineering and Technology during office hours namely, From Bidding Document Sale Start Time: 10:00hrs to Bidding Document Sale End Time: 11:00hrs , on all working days either in person or by post.

- a) **Price of Bidding Document (non-refundable)** Rs. 2000
- b) **Postal Charges, Inland :** Rs. 100
- c) **Postal Charges, Overseas :** Rs.-
- d) **Date of Commencement of Sale of Bidding Document :** Date: 25-Jul-2019 Time: 10:00 Hrs
- e) **Bid Security Amount (In INR):** Rs. :200000
- f) **Pre-Bid Meeting Date and Time:** Date: 07-Aug-2019 Time: 11:00

- g) **Last date for Sale of Bidding Document :** Date: 26-Aug-2019 Time: 11:00 Hrs
- h) **Last Date and Time for Receipt of Bids :** Date: 26-Aug-2019 Time: 14:30 Hrs
- i) **Time and Date of Opening of Bids** Date:26-Aug-2019 Time: 15:30 Hrs
- j) **Place of Opening of Bid :** Department of Electrical and Instrumentation Engineering
SLIET, Longowal – 148106 (Punjab)
- k) **Address for Communication :** **TEQIP-III Office,
Mechanical Engineering Block,
Sant Longowal Institute of Engineering & Technology,
Longowal - 148106 Punjab, India**

7.	All bids must be accompanied by a bid security as specified in the bid document and must be delivered to the above office at the date and time indicated above.
8.	Bids will be opened in the presence of Bidders' representatives who choose to attend on the specified date and time.
9.	In the event of the date specified for bid receipt and opening being declared as a closed holiday for purchaser's office, the due date for submission of bids and opening of bids will be the following working day at the appointed times

SECTION II: INSTRUCTIONS TO BIDDER

SECTION II: INSTRUCTIONS TO BIDDERS

Clause No.	Topic	Page No.	Clause No	Topic	Page No.
	A. Introduction			D. Submission of Bids	
1.	Source of Funds	8	18.	Sealing and Marking of Bids	17
2.	Eligible Bidders	8	19.	Deadline for Submission of Bids	17
3.	Eligible Goods and Services	8	20.	Late Bids	18
4.	Cost of Bidding	9	21.	Modification and withdrawal of Bid	18
	B. Bidding Documents			E. Opening and Evaluation Bids	
5.	Contents of Bidding Documents	10	22.	Opening of Bids by the Purchaser	19
6.	Clarification of Bidding Documents	10	23.	Clarification of Bids	19
7.	Amendment of Bidding Documents	11	24.	Preliminary Examination	19
	C. Preparation of Bids		25.	Conversion to Single Currency	20
			26.	Evaluation and Comparison of Bids	20
8.	Language of Bid	12	27.	Domestic Preference	22
9.	Documents Comprising the Bid	12	28.	Contacting the Purchaser	22
10.	Bid Form	12		F. Award of Contract	
11.	Bid Prices	12	29.	Post qualification	23
12.	Bid Currencies	13	30.	Award Criteria	23
13.	Documents Establishing Bidder's Eligibility and Qualifications	13	31.	Purchaser's Right to Vary Quantities at Time of Award	23
14.	Documents Establishing Goods Eligibility and Conformity to Bid Documents	14	32.	Purchaser's Right to Vary Quantities at Time of Award	23
15.	Bid Security	15	33.	Notification of Award	23
16.	Period of Validity of Bids	15	34.	Signing of Contract	24
17.	Format and Signing of Bid	16	35.	Performance Security	24
			36.	Corrupt and Fraudulent Practices	24

A. Introduction

1.	Source of Funds
1.1	The Government of India has received a credit from the International Development Association (Here-in-after called as Bank) in various currencies equivalent to USD 300 million towards the cost of Technical Education Quality Improvement Programme [TEQIP]-Phase III(TEQIP III) and intends to apply part of the proceeds of this credit to eligible payments under the contracts for which this invitation for Bid is issued.
1.2	Payment by the Bank will be made only at the request of the Borrower and upon approval by The Bank in accordance with the terms and conditions of the Credit Agreement, and will be subject in all respects to the terms and conditions of that agreement. The Credit Agreement prohibits a withdrawal from the Credit account for the purpose of any payment to persons or entities, or for any import of goods, if such payment or import, to the knowledge of the Bank, is prohibited by a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations. No party other than the Borrower shall derive any rights from the Credit Agreement or have any claim to the Credit proceeds.

2.	Eligible Bidders
2.1	This Invitation for Bids is open to all suppliers from eligible source countries as defined in Guidelines: <i>Procurement under IDA Credits</i> , May 2004, revised October 2006 hereinafter referred as the <i>IDA Guidelines for Procurement</i> , except as provided hereinafter.
2.2	Bidders should not be associated, or have been associated in the past, directly or indirectly, with a firm or any of its affiliates which have been engaged by the Purchaser to provide consulting services for the preparation of the design, specifications, and other documents to be used for the procurement of the goods to be purchased under this Invitation of Bids.
2.3	Government-owned enterprises in the Purchaser's country may participate only if they are legally and financially autonomous, if they operate under commercial law, and if they are not a dependent agency of the Purchaser.
2.4	Bidders shall not be under a declaration of ineligibility for corrupt and fraudulent practices issued by the Bank in accordance with ITB Clause 36.1.
3.	Eligible Goods and Services
3.1	All goods and ancillary services to be supplied under the Contract shall have their origin in eligible source countries, defined in the <i>IDA Guidelines for Procurement</i> and all expenditures made under the Contract will be limited to such goods and services.
3.2	For purposes of this clause, "origin" means the place where the goods are mined, grown, or produced or

	from which the ancillary services are supplied. Goods are produced when, through manufacturing, processing or substantial and major assembling of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components.
3.3	The origin of goods and services is distinct from the nationality of the Bidder.

4.	Cost of Bidding
4.1	The Bidder shall bear all costs associated with the preparation and submission of its bid, and The Director Sant Longowal Institute of Engineering and Technology , here-in-after referred to as "the Purchaser", will in no case be responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.

B. The Bidding Documents

5.	Content of Bidding Documents
5.1	The goods required, bidding procedures and contract terms are prescribed in the bidding Documents. In addition to the Invitation for Bids, the bidding documents include:

- (a) Instruction to Bidders (ITB) ;
- (b) General Conditions of Contract (GCC) ;
- (c) Special Conditions of Contract (SCC) ;
- (d) Schedule of Requirements;
- (e) Technical Specifications;
- (f) Bid Form and Price Schedules;
- (g) Bid Security Form;
- (h) Contract Form;
- (i) Performance Security Form;
- (j) Performance Statement Form;
- (k) Manufacturer's Authorization Form;
- (l) Bank Guarantee for Advance Payment Form; and
- (m) Equipment and Quality Control Form.

5.2	The Bidder is expected to examine all instructions, forms, terms, and specifications in the bidding documents. Failure to furnish all information required by the bidding documents or submission of a bid not substantially responsive to the bidding documents in every respect will be at the Bidder's risk and may result in rejection of its bid.
6.	Clarification of Bidding Documents
6.1	A prospective Bidder requiring any clarification of the bidding documents may notify the Purchaser in writing or by telex or cable or fax at the Purchaser's mailing address indicated in the Invitation for Bids. The Purchaser will respond in writing to any request for clarification of the bidding documents which it receives no later than 15 days prior to the deadline for submission of bids prescribed by the Purchaser. Written copies of the Purchaser's response (including an explanation of the query but without identifying the source of inquiry) will be sent to all prospective bidders which have received the bidding documents.

7.	Amendment of Bidding Documents
7.1	At any time prior to the deadline for submission of bids, the Purchaser may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, Modify the bidding documents by amendment.
7.2	All prospective bidders who have received the bidding documents will be notified of the Amendment in writing or by cable or by fax, and will be binding on them.
7.3	In order to allow prospective bidders reasonable time in which to take the amendment into account in preparing their bids, the Purchaser, at its discretion, may extend the deadline for the submission of bids.

C. Preparation of Bids

8.	Language of Bid
8.1	The bid prepared by the Bidder, as well as all correspondence and documents relating to the bid exchanged by the Bidder and the Purchaser, shall be written in English language. Supporting documents and printed literature furnished by the Bidder may be in another language provided they are accompanied by an accurate translation of the relevant passages in the English language in which case, for purposes of interpretation of the Bid, the translation shall govern.
9.	Documents Constituting the Bid
9.1	The bid prepared by the Bidder shall comprise the following components:

(a)	a Bid Form and a Price Schedule completed in accordance with ITB Clauses 10, 11 and 12;
(b)	documentary evidence established in accordance with ITB Clause 13 that the Bidder is eligible to bid and is qualified to perform the contract if its bid is accepted;
(c)	documentary evidence established in accordance with ITB Clause 14 that the goods and ancillary services to be supplied by the Bidder are eligible goods and services and conform to the bidding documents; and
(d)	bid security furnished in accordance with ITB Clause 15.

10.	Bid Form
10.1	The Bidder shall complete the Bid Form and the appropriate Price Schedule furnished in the bidding documents, indicating the goods to be supplied, a brief description of the goods, their country of origin, quantity and prices.

11.	Bid Prices
11.1	The Bidder shall indicate on the Price Schedule the unit prices and total bid prices of the goods it proposes to supply under the Contract. To this end, the Bidders are allowed the option to submit the bids for any one or more schedules specified in the 'Schedule of Requirements' and to offer discounts for combined schedules. However, Bidders shall quote for the complete requirement of goods and services specified under each schedule on a single responsibility basis, failing which such bids will not be taken into account for evaluation and will not be considered for award.
11.	Prices indicated on the Price Schedule shall be entered separately in the following manner:
(i)	the price of the goods, quoted (ex-works, ex-factory, ex-showroom, ex-warehouse, or off-the-shelf, applicable), including all duties and sales and other taxes already paid or payable:

	<p>a. on components and raw material used in the manufacture or assembly of goods quoted ex-works or ex-factory; or</p> <p>b. on the previously imported goods of foreign origin quoted ex-showroom, ex-warehouse or off-the-shelf.</p>
(ii)	any Indian duties, sales and other taxes which will be payable on the goods if this Contract is awarded;
(iii)	the price for inland transportation, insurance and other local costs incidental to delivery of the goods to their final destination; and the price of other incidental services listed in Clause 8 of the Special Conditions of Contract.

11.3	The Bidder's separation of the price components in accordance with ITB Clause 11.2 above will be solely for the purpose of facilitating the comparison of bids by the Purchaser and will not in any way limit the Purchaser's right to contract on any of the terms offered.
11.4	Fixed Price. Prices quoted by the Bidder shall be fixed during the Bidder's performance of the Contract and not subject to variation on any account. A bid submitted with an adjustable price Quotation will be treated as non-responsive and rejected, pursuant to ITB Clause 24.

12.	Bid Currencies
12.1	Prices shall be quoted in Indian Rupees:

13.	Documents Establishing Bidder's Eligibility and Qualifications
13.1	Pursuant to ITB Clause 9, the Bidder shall furnish, as part of its bid, documents establishing the Bidder's eligibility to bid and its qualifications to perform the Contract if its bid is accepted.
13.2	The documentary evidence of the Bidder's eligibility to bid shall establish to the Purchaser's satisfaction that the Bidder, at the time of submission of its bid, is from an eligible country as defined under ITB Clause 2.
13.3	The documentary evidence of the Bidder's qualifications to perform the Contract if its bid is accepted, shall establish to the Purchaser's satisfaction:

(a)	that, in the case of a Bidder offering to supply goods under the contract which the Bidder did not manufacture or otherwise produce, the Bidder has been duly authorized (as per authorization form in Section XII) by the goods' Manufacturer or producer to supply the goods in India.
	<i>[Note: Supplies for any particular item in each schedule of the bid should be from one manufacturer only. Bids from agents offering supplies from different manufacturer's for the same item of the schedule in the bid will be treated as non-responsive.]</i>
(b)	that the Bidder has the financial, technical, and production capability necessary to

	perform the Contract and meets the criteria outlined in the Qualification requirements specified in Section VI-A. To this end, all bids submitted shall include the following information:
(i)	The legal status, place of registration and principal place of business of the company or firm or partnership, etc.;
(ii)	Details of experience and past performance of the bidder on equipment offered and on those of similar nature within the past three years and details of current contracts in hand and other commitments (suggested performance given in Section XI);

14.	Documents Establishing Goods' Eligibility and Conformity to Bidding Documents
14.1	Pursuant to ITB Clause 9, the Bidder shall furnish, as part of its bid, documents establishing the eligibility and conformity to the bidding documents of all goods and services which the Bidder proposes to supply under the contract.
14.2	The documentary evidence of the goods and services eligibility shall consist of a statement in the Price Schedule on the country of origin of the goods and services offered which shall be confirmed by a certificate of origin at the time of shipment.
14.3	The documentary evidence of conformity of the goods and services to the bidding documents may be in the form of literature, drawings and data, and shall consist of :

(a)	a detailed description of the essential technical and performance characteristics of the goods ;
(b)	a list giving full particulars, including available sources and current prices, of spare parts, special tools, etc., necessary for the proper and continuing functioning of the goods for a period of two years, following commencement of the use of the goods by the Purchaser; and
(c)	an item-by-item commentary on the Purchaser's Technical Specifications demonstrating substantial responsiveness of the goods and services to those specifications or a statement of deviations and exceptions to the provisions of the Technical Specifications.

14.4	For purposes of the commentary to be furnished pursuant to ITB Clause 14.3(c) above, the Bidder shall note that standards for workmanship, material and equipment, and references to brand names or catalogue numbers designated by the Purchaser in its Technical Specifications are intended to be descriptive only and not restrictive. The Bidder may substitute alternative standards, brand names and/or catalogue numbers in its bid, provided that it demonstrates to the Purchaser's satisfaction that the substitutions ensure substantial Equivalence to those designated in the Technical Specifications.
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15.	Bid Security
15.1	Pursuant to ITB Clause 9, the Bidder shall furnish, as part of its bid, a bid security in the Amount as specified in Section-V - Schedule of Requirements.
15.2	The bid security is required to protect the Purchaser against the risk of Bidder's conduct which would warrant the security's forfeiture, pursuant to ITB Clause 15.7.

The bid security shall be denominated in Indian Rupees and shall:	
(a)	at the bidder's option, be in the form of either a certified check, letter of credit, a demand draft, or a bank guarantee from a nationalized/Scheduled Bank located in India or by a reputable banking institution selected by the bidder and located abroad in any eligible country;
(b)	be substantially in accordance with one of the form of bid security included in Section VIII or other form approved by the Purchaser prior to bid submission;
(c)	be payable promptly upon written demand by the Purchaser in case any of the conditions listed in ITB Clause 15.7 are invoked;
(d)	be submitted in its original form; copies will not be accepted; and
(e)	remain valid for a period of 45 days beyond the original validity period of bids, or beyond any period of extension subsequently requested under ITB Clause 16.2.

15.3	Any bid not secured in accordance with ITB Clauses 15.1 and 15.3 above will be rejected by the Purchaser as non-responsive, pursuant to ITB Clause 24.
15.4	Unsuccessful bidder's bid securities will be discharged/returned as promptly as possible but not Later than 30 days after the expiration of the period of bid validity prescribed by the Purchaser, pursuant to ITB Clause 16.
15.5	The successful Bidder's bid security will be discharged upon the Bidder signing the Contract, pursuant to ITB Clause 34, and furnishing the performance security, pursuant to ITB Clause 35.
15.7	<p>The bid security may be forfeited:</p> <p>(a) if a Bidder</p> <p>(i) withdraws its bid during the period of bid validity specified by the Bidder on the Bid Form;</p> <p>or (ii) does not accept the correction of errors pursuant to ITB Clause 24.2; or</p> <p>(b) in case of a successful Bidder, if the Bidder fails:</p> <p>(i) to sign the Contract in accordance with ITB Clause 34; or</p> <p>(ii) to furnish performance security in accordance with ITB Clause 35.</p>
16.	Period of Validity of Bids
16.1	Bids shall remain valid for 90 days after the deadline for submission of bids prescribed by the Purchaser, pursuant to ITB Clause 19. A bid valid for a shorter period shall be rejected by the Purchaser as non-responsive.

16.2	<p>In the case of fixed prices contracts, in the event that the Purchaser requests and the Bidder agrees to an extension of the validity period, the contract price, if the Bidder is selected for award shall be the bid price corrected as follows:</p> <p>The price shall be increased by the factor (B =10 % per Annum) for each week or part of a week that has elapsed from the expiration of the initial bid validity to the date of notification of award to the successful Bidder.</p>
16.3	<p>In the case of fixed prices contracts, in the event that the Purchaser requests and the Bidder agrees to an extension of the validity period, the contract price, if the Bidder is selected for award shall be the bid price corrected as follows:</p> <p>The price shall be increased by the factor (B =10 % per Annum) for each week or part of a week that has elapsed from the expiration of the initial bid validity to the date of notification of award to the successful Bidder.</p>
	Bid evaluation will be based on the bid prices without taking into consideration the corrections.
17.	Format and Signing of Bid
17.1	The Bidder shall prepare two copies of the bid, clearly marking each "Original Bid" and "Copy Bid", as appropriate. In the event of any discrepancy between them, the original shall govern.
17.2	The original and all copies of the bid shall be typed or written in indelible ink and shall be signed by the Bidder or a person or persons duly authorized to bind the Bidder to the Contract. The latter authorization shall be indicated by written power-of-attorney accompanying the bid. All pages of the bid, except for unamended printed literature, shall be initialed by the person or persons signing the bid.
17.3	Any interlineations, erasures or overwriting shall be valid only if they are initialed by the persons or persons signing the bid.
17.4	The Bidder shall furnish information as described in the Form of Bid on commissions or gratuities, if any, paid or to be paid to agents relating to this Bid, and to contract execution if the Bidder is awarded the contract.

D. Submission of Bids

18.	Sealing and Marking of Bids	
	18.1	The Bidders shall seal the original and each copy of the bid in separate inner envelopes, duly marking the envelopes as "original" and "copy". He shall then place all the inner envelopes in an outer envelope.
	18.2	The inner and outer envelopes shall:
	(a)	be addressed to the Purchaser at the following address:

Coordinator TEQIP - III

Sant Longowal Institute of Engineering and Technology,

Longowal – 148106 (Punjab) INDIA

	(b)	bear the Project Name, Technical Education Quality Improvement Programme [TEQIP]- Phase III the Invitation for Bids (IFB) title and number TEQIP-III/2019/SLIE/38 and a statement "Do not open before
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15:30Hrs on 26-Aug-2019."

	18.3	The inner envelopes shall also indicate the name and address of the Bidder to enable the bid to be returned unopened in case it is declared "late".
	18.4	If the outer envelope is not sealed and marked as required by ITB Clause 18.2, the Purchaser will assume no responsibility for the bid's misplacement or premature opening.
	18.5	Telex, cable or facsimile bids will be rejected.

19.	Deadline for Submission of Bids	
	19.1	Bids must be received by the Purchaser at the address specified under ITB Clause 18.2 (a) no later than the time and date specified in the Invitation for Bids (Section I). In the event of the specified date for the submission of Bids being declared a holiday for the Purchaser, the Bids will be received upto the appointed time on the next working day.
	19.2	The Purchaser may, at its discretion, extend this deadline for submission of bids by amending the bid documents in accordance with ITB Clause 7, in which case all rights and obligations of the Purchaser and Bidders previously subject to the deadline will thereafter be subject to the deadline as extended.

20.	Late Bids	
	20.1	Any bid received by the Purchaser after the deadline for submission of bids prescribed by the Purchaser, pursuant to ITB Clause 19, will be rejected and/or returned unopened to the Bidder.
21.	Modification and Withdrawal of Bids	
	21.1	The Bidder may modify or withdraw its bid after the bid's submission, provided that written notice of the modification or withdrawal is received by the Purchaser prior to the deadline prescribed for submission of bids.
	21.2	The Bidder's modification or withdrawal notice shall be prepared, sealed, marked and dispatched in accordance with the provisions of ITB Clause 18. A withdrawal notice may also be sent by telex or cable or fax but followed by a signed confirmation copy, post marked not later than the deadline for submission of bids.
	21.3	No bid may be modified subsequent to the deadline for submission of bids.
	21.4	No bid may be withdrawn in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the bid form. Withdrawal of a bid during this interval may result in the Bidder's forfeiture of its bid security, pursuant to ITB Clause 15.7.

E. Bid Opening and Evaluation of Bids

22.	Opening of Bids by the Purchaser	
	22.1	The Purchaser will open all bids, in the presence of Bidders' representatives who choose to attend, at 15:30 Hrs on 26-Aug-2019 and in the following location: Department of Electrical and Instrumentation Engineering, SLIET Longowal
		The Bidders' representatives who are present shall sign a register evidencing their attendance. In the event of the specified date of Bid opening being declared a holiday for the Purchaser, the Bids shall be opened at the appointed time and location on the next working day.

	22.2	The bidders' names, bid modifications or withdrawals, bid prices, discounts, and the presence or absence of requisite bid security and such other details as the Purchaser, at discretion, may consider appropriate, will be announced at the opening. No bid shall be rejected at bid opening, except for late bids, which shall be returned unopened to the Bidder pursuant to ITB Clause 20.
	22.3	Bids (and modifications sent pursuant to ITB Clause 21.2) that are not opened and read out at bid opening shall not be considered further for evaluation, irrespective of the circumstances.
	22.4	The Purchaser will prepare minutes of the bid opening.

23.	Clarification of Bids	
	23.1	During evaluation of bids, the Purchaser may, at its discretion, ask the Bidder for a clarification of its bid. The request for clarification and the response shall be in writing and no change in prices or substance of the bid shall be sought, offered or permitted.

24.	Preliminary Examination	
	24.1	The Purchaser will examine the bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the bids are generally in order. Bids from Agents, without proper authorization from the manufacturer as per Section XII, shall be treated as non-responsive.
	24.2	Where the Bidder has quoted for more than one schedule, if the bid security furnished

	is inadequate for all the schedules, the Purchaser shall take the price bid into account only to the extent the bid is secured. For this purpose, the extent to which the bid is secured shall be determined by evaluating the requirement of bid security to be furnished for the schedule included in the bid (offer) in the serial order of the Schedule of Requirements of the Bidding documents.
24.3	Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail, and the total price shall be corrected. If there is a discrepancy between words and figures, the amount in words will prevail. If the supplier does not accept the correction of errors, its bid will be rejected and its bid security may be forfeited.
24.4	The Purchaser may waive any minor informality or non-conformity or irregularity in a bid which does not constitute a material deviation, provided such a waiver does not prejudice or affect the relative ranking of any Bidder.
24.5	Prior to the detailed evaluation, pursuant to ITB Clause 26, the Purchaser will determine the substantial responsiveness of each bid to the bidding documents. For purposes of these Clauses, a substantially responsive bid is one which conforms to all the terms and conditions of the bidding documents without material deviations. Deviations from or objections or reservations to critical provisions such as those concerning Performance Security (GCC Clause 7). Warranty (GCC Clause 15), Force Majeure (GCC Clause 25), Limitation of liability (GCC Clause 29), Applicable law (GCC Clause 31), and Taxes & Duties (GCC Clause 33) will be deemed to be a material deviation. The Purchaser's determination of a bid's responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence.
24.6	If a bid is not substantially responsive, it will be rejected by the Purchaser and may not subsequently be made responsive by the Bidder by correction of the non-conformity.
25.	Deleted

26.	Evaluation and Comparison of Bids
26.1	The Purchaser will evaluate and compare the bids which have been determined to be substantially responsive, pursuant to ITB Clause 24 for each schedule separately. No bid

	will be considered if the complete requirements covered in the schedule is not included in the bid. However, as stated in Para 11, Bidders are allowed the option to bid for any one or more schedules and to offer discounts for combined schedules. These discounts will be taken into account in the evaluation of the bids so as to determine the bid or combination of bids offering the lowest evaluated cost for the Purchaser in deciding award(s) for each schedule.
26.2	The Purchaser's evaluation of a bid will exclude and not take into account:
(a)	in the case of goods manufactured in India or goods of foreign origin already located in India, sales and other similar taxes, which will be payable on the goods if a contract is awarded to the Bidder;
(b)	any allowance for price adjustment during the period of execution of the Contract, if provided in the bid.
26.3	Deleted.
26.4	The Purchaser's evaluation of a bid will take into account, in addition to the bid price (Ex-factory/ex-warehouse/off-the-shelf price of the goods offered from within India, such price to include all costs as well as duties and taxes paid or payable on components and raw material incorporated or to be incorporated in the goods, and Excise duty on the finished goods, if payable) and price of incidental services, the following factors, in the manner and to the extent indicated in ITB Clause 26.5 and in the Technical Specifications:
(a)	cost of inland transportation, insurance and other costs within India incidental to the delivery of the goods to their final destination;
(b)	delivery schedule offered in the bid;
(c)	deviations in payment schedule from that specified in the Special Conditions of Contract;
(d)	the cost of components, mandatory spare parts and service;
(e)	the availability in India of spare parts and after-sales services for the goods / equipment offered in the bid;
(f)	the projected operating and maintenance costs during the life of the equipment; and
(g)	the performance and productivity of the equipment offered.
26.5	Pursuant to ITB Clause 26.4, one or more of the following evaluation methods will be applied:
(a)	Inland Transportation, Insurance and Incidentals:
(i)	Inland transportation, insurance and other incidentals for delivery of goods to the final destination as stated in ITB Clause 11.2 (iii).

	The above costs will be added to the bid price.
(b)	Delivery Schedule:
(i)	The Purchaser requires that the goods under the Invitation for Bids shall be delivered at the time specified in the Schedule of Requirements. The estimated time of arrival of the goods at the project site should be calculated for each bid after allowing for reasonable transportation time. Treating the date as per schedule of requirements as the base, a delivery "adjustment" will be calculated for other bids at 2% of the ex-factory price including excise duty for each month of delay beyond the base and this will be added to the bid price for evaluation. No credit will be given to earlier deliveries and bids offering delivery beyond months of stipulated delivery period will be treated as unresponsive.
(c)	Deviation in Payment Schedule:
	Deleted
(d)	Cost of Spare Parts:
	Deleted
(e)	<i>Spare Parts and After Sales Service Facilities in India:</i> The cost to the Purchaser of establishing the minimum service facilities and parts inventories, as outlined elsewhere in the bidding documents, if quoted separately, shall be added to the bid price.
(f)	Operating and Maintenance Costs:
	Deleted
(g)	Performance and Productivity of the Equipment:
	Deleted

27.	Deleted.
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28.	Contacting the Purchaser
28.1	Subject to ITB Clause 23, no Bidder shall contact the Purchaser on any matter relating to its bid, from the time of the bid opening to the time the Contract is awarded. If the bidder wishes to bring additional information to the notice of the purchaser, it should do so in writing.
28.2	Any effort by a Bidder to influence the Purchaser in its decisions on bid evaluation, bid comparison or contract award may result in rejection of the Bidder's bid

F. Award of Contract

29.	Post qualification
29.1	In the absence of prequalification, the Purchaser will determine to its satisfaction whether the Bidder that is selected as having submitted the lowest evaluated responsive bid meets the criteria specified in ITB Clause 13.3 (b) and is qualified to perform the contract satisfactorily
29.2	The determination will take into account the Bidder's financial, technical and production capabilities. It will be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB Clause 13, as well as such other information as the Purchaser deems necessary and appropriate.
29.3	An affirmative determination will be a prerequisite for award of the Contract to the Bidder. A negative determination will result in rejection of the Bidder's bid, in which event the Purchaser will proceed to the next lowest evaluated bid to make a similar determination of that Bidder's capabilities to perform the contract satisfactorily.

30.	Award Criteria
30.1	Subject to ITB Clause 32, the Purchaser will award the Contract to the successful Bidder whose bid has been determined to be substantially responsive and has been determined as the lowest evaluated bid, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.

31.	Purchaser's right to vary Quantities at Time of Award
31.1	The Purchaser reserves the right at the time of Contract award to increase or decrease by up to 15 percent of the quantity of goods and services originally specified in the Schedule of Requirements without any change in unit price or other terms and conditions.

32.	Purchaser's Right to Accept Any Bid and to Reject Any or All Bids
32.1	The Purchaser reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to contract award, without thereby incurring any liability to the affected Bidder or bidders.
33.	Notification of Award
33.1	Prior to the expiration of the period of bid validity, the Purchaser will notify the successful bidder in writing by registered letter or by cable/telex or fax, to be confirmed in writing by registered letter, that its bid has been accepted.

33.2	The notification of award will constitute the formation of the Contract.
33.3	Upon the successful Bidder's furnishing of performance security pursuant to ITB Clause 35, the Purchaser will promptly notify the name of the winning bidder to each unsuccessful Bidder and will discharge its bid security, pursuant to ITB Clause 15.
33.4	If, after notification of award, a Bidder wishes to ascertain the grounds on which its bid was not selected, it should address its request to the Purchaser. The Purchaser will promptly respond in writing to the unsuccessful Bidder.

34.	Signing of Contract
34.1	At the same time as the Purchaser notifies the successful bidder that its bid has been accepted, the Purchaser will send the bidder the Contract Form provided in the bidding documents, incorporating all agreements between the parties.
34.2	Within 21 days of receipt of the Contract Form, the successful bidder shall sign and date the Contract and return it to the Purchaser.

35.	Performance Security
35.1	Performance Security 5 % of the Evaluated Cost (Basic + GST).
35.2	Within 21 days of the receipt of notification of award from the Purchaser, the successful Bidder shall furnish the performance security in accordance with the Conditions of Contract, in the Performance Security Form provided in the bidding documents or in another form acceptable to the Purchaser.
35.3	Failure of the successful bidder to comply with the requirement of ITB Clause 34.2 or ITB Clause 35.1 shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security, in which event the Purchaser may make the award to the next lowest evaluated bidder or call for new bids.
36.	Corrupt or Fraudulent Practices
36.1	It is the Bank's policy that Borrowers (including beneficiaries of Bank loans), as well as Bidders, Suppliers, and Contractors, and their agents (whether declared or not), personnel, subcontractors, sub-consultants, service providers and suppliers under Bank-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts [1]. In pursuance of this policy, the Bank:
(a)	defines, for the purposes of this provision, the terms set forth below as follows:
(i)	"corrupt practice" [2] means the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence the action of a public official in the procurement process or in contract execution;

(ii)	“fraudulent practice”[3] means a misrepresentation or omission of facts in order to influence a procurement process or the execution of a contract;
(iii)	“collusive practice” [4] means a scheme or arrangement between two or more Bidders, with or without the knowledge of the borrower, designed to establish bid prices at artificial, noncompetitive levels; and
(iv)	“coercive practice” [5] means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the procurement process or affect the execution of a contract;
(v)	“Obstructive practice” is
(aa)	deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and /or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or
(bb)	acts intended to materially impede the exercise of the Bank’s inspection and audit rights provided for under sub – clause 36.1 (e) below.
(b)	will reject a proposal for award if it determines that the Bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive or coercive practices in competing for the Contract in question;
(c)	will cancel the portion of the loan allocated to a contract if it determines at any time that representatives of the Borrower or of a beneficiary of the loan engaged in corrupt, fraudulent, collusive or coercive practices during the procurement or the execution of that contract, without the Borrower having taken timely and appropriate action satisfactory to the Bank to address such practices when they occur;
(d)	will sanction a firm or an individual, at any time, in accordance with prevailing Bank’s sanctions procedures[6], including by publically declaring such firm or individual ineligible, either indefinitely or for a stated period of time, (i) to be awarded a Bank-financed contract; and (ii) to be a nominated[7] subcontractor, consultant, manufacturer or supplier, or service provider of and otherwise eligible firm being awarded a Bank-financed contract; and
(e)	will have the right to require that a provision be included in Bidding Documents and in contracts financed by a Bank loan, requiring Bidders, Suppliers, and Contractors and their sub-contractors to permit the Bank to inspect their accounts and records and other documents relating to the bid submission and contract performance and to have them audited by auditors appointed by the Bank.
36.2	Furthermore, Bidders shall be aware of the provision stated in sub-clause 24.1 (c) of the General Conditions of Contract.

SECTION III: GENERAL CONDITIONS OF CONTRACT

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TABLE OF CLAUSES

Clause Number	Topic	Page No.
1	Definitions	28
2	Application	28
3	Country of Origin	28
4	Standards	29
5	Use of Contract Documents and Information	29
6	Patent Rights	29
7	Performance Security	29
8	Inspection and Tests	30
9	Packing	30
10	Delivery and Documents	31
11	Insurance	31
12	Transportation	31
13	Incidental Services	31
14	Spare Parts	32
15	Warranty	32
16	Payment	33
17	Prices	33
18	Change Orders	33
19	Contract Amendments	34
20	Assignment	34
21	Subcontracts	34
22	Delays in Supplier's Performance	34
23	Liquidated Damages	34
24	Termination for Default	35
25	Force Majeure	35
26	Termination for Insolvency	35
27	Termination for Convenience	36
28	Settlement of Disputes	36
29	Limitation of Liability	36
30	Governing Language	37
31	Applicable Law	37
32	Notices	37
33	Taxes and Duties	37
34	Fraud and Corruption	37

General Conditions of Contract

1. Definitions

1.1 In this Contract, the following terms shall be interpreted as indicated:

- (a) "The Contract" means the agreement entered into between the Purchaser and the Supplier, as recorded in the Contract Form signed by the parties, including all the attachments and appendices thereto and all documents incorporated by reference therein;
- (b) "The Contract Price" means the price payable to the Supplier under the Contract for the full and proper performance of its contractual obligations;
- (c) "The Goods" means all the equipment, machinery, and/or other materials which the Supplier is required to supply to the Purchaser under the Contract;
- (d) "Services" means services ancillary to the supply of the Goods, such as transportation and insurance, and any other incidental services, such as installation, commissioning, provision of technical assistance, training and other obligations of the Supplier covered under the Contract;
- (e) "GCC" means the General Conditions of Contract contained in this section.
- (f) "SCC" means the Special Conditions of Contract.
- (g) "The Purchaser" means the organization purchasing the Goods, as named in SCC.
- (h) "The Purchaser's country" is the country named in SCC.
- (i) "The Supplier" means the individual or firm supplying the Goods and Services under this Contract.
- (j) "The World Bank" means the International Bank for Reconstruction and Development (IBRD) or the international Development Association (IDA).
- (k) "The Project Site", where applicable, means the place or places named in SCC.
- (l) "Day" means calendar day.

2. Application

2.1 These General Conditions shall apply to the extent that they are not superseded by provisions in other parts of the Contract.

3. Country of Origin

- 3.1 All Goods and Services supplied under the Contract shall have their origin in the member countries and territories eligible under the rules of the World Bank as further elaborated in SCC.
- 3.2 For purposes of this Clause "origin" means the place where the Goods are mined, grown

or produced, or from which the Services are supplied. Goods are produced when, through manufacturing, processing or substantial and major assembling of components, a commercially recognized new product results that is substantially different in basic characteristics or in purpose or utility from its components.

3.3 The origin of Goods and Services is distinct from the nationality of the Supplier.

4. Standards

The Goods supplied under this Contract shall conform to the standards mentioned in the Technical Specifications, and, when no applicable standard is mentioned, to the authoritative standard appropriate to the Goods' country of origin and such standards shall be the latest issued by the concerned institution.

5. Use of Contract Documents and Information

5.1 The Supplier shall not, without the Purchaser's prior written consent, disclose the Contract, or any provision thereof, or any specification, plan, drawing, pattern, sample or information furnished by or on behalf of the Purchaser in connection therewith, to any person other than a person employed by the Supplier in performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purposes of such performance.

5.2 The Supplier shall not, without the Purchaser's prior written consent, make use of any document or information enumerated in GCC Clause 5.1 except for purposes of performing the Contract.

5.3 Any document, other than the Contract itself, enumerated in GCC Clause 5.1 shall remain the property of the Purchaser and shall be returned (in all copies) to the Purchaser on completion of the Supplier's performance under the Contract if so required by the Purchaser.

6. Patent Rights

6.1 The Supplier shall indemnify the Purchaser against all third-party claims of infringement patent, trademark or industrial design rights arising from use of the Goods or any part thereof in India.

7. Performance Security

7.1 Within 21 days of receipt of the notification of contract award, the Supplier shall furnish performance security in the amount specified in SCC.

7.2 The proceeds of the performance security shall be payable to the Purchaser as compensation for any loss resulting from the Supplier's failure to complete its obligations under the Contract.

The Performance Security shall be denominated in Indian Rupees and shall be in one of the following forms:

- (a) A Bank guarantee or irrevocable Letter of Credit, issued by a nationalized/scheduled bank located in India or a bank located abroad acceptable to the Purchaser, in the form provided in the bidding documents or another form acceptable to the Purchaser; or
- (b) A cashier's check, certified check, or demand draft.

7.3 The performance security will be discharged by the Purchaser and returned to the Supplier not later than 30 days following the date of completion of the Supplier's performance obligations, including any warranty obligations, unless specified otherwise in SCC.

8. Inspections and Tests

8.1 The Purchaser or its representative shall have the right to inspect and/or to test the Goods to confirm their conformity to the Contract specifications at no extra cost to the Purchaser. SCC and the Technical Specifications shall specify what inspections and tests the Purchaser requires and where they are to be conducted. The Purchaser shall notify the Supplier in writing in a timely manner of the identity of any representatives retained for these purposes.

8.2 The inspections and tests may be conducted on the premises of the Supplier or its subcontractor(s), at point of delivery and/or at the Goods final destination. If conducted on the premises of the Supplier or its subcontractor(s), all reasonable facilities and assistance, including access to drawings and production data - shall be furnished to the inspectors at no charge to the Purchaser.

8.3 Should any inspected or tested Goods fail to conform to the specifications, the Purchaser may reject the goods and the Supplier shall either replace the rejected Goods or make alterations necessary to meet specification requirements free of cost to the Purchaser.

8.4 The Purchaser's right to inspect, test and, where necessary, reject the Goods after the Goods' arrival at Project Site shall in no way be limited or waived by reason of the Goods having previously been inspected, tested and passed by the Purchaser or its representative prior to the Goods shipment.

8.5 Nothing in GCC Clause 8 shall in any way release the Supplier from any warranty or other obligations under this Contract.

9. Packing

9.1 The Supplier shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination as indicated in the Contract. The

packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the Goods' final destination and the absence of heavy handling facilities at all points in transit.

- 9.2 The packing, marking and documentation within and outside the packages shall comply strictly with such special requirements as shall be provided for in the Contract including additional requirements, if any, specified in SCC and in any subsequent instructions ordered by the Purchaser.

10. Delivery and Documents

- 10.1 Delivery of the Goods shall be made by the Supplier in accordance with the terms specified in the Contract and the details of shipping and/or other documents to be furnished by the supplier are specified in SCC.

11. Insurance

- 11.1 The Goods supplied under the Contract shall be fully insured in Indian Rupees against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery in the manner specified in SCC.

12. Transportation

- 12.1 Deleted.
- 12.2 Deleted.
- 12.3 Where the Supplier is required under the Contract to transport the Goods to a specified place of destination within India defined as Project site, transport to such place of destination in India including insurance, as shall be specified in the Contract, shall be arranged by the Supplier, and the related cost shall be included in the Contract Price.
- 12.4 Deleted

13. Incidental Services

- 13.1 The supplier may be required to provide any or all of the following services, including additional services, if any, specified in SCC:
- (a) performance or supervision of the on-site assembly and/or start-up of the supplied Goods;
 - (b) furnishing of tools required for assembly and/or maintenance of the supplied Goods;
 - (c) furnishing of detailed operations and maintenance manual for each appropriate unit of supplied Goods;
 - (d) performance or supervision or maintenance and/or repair of the supplied Goods, for a

period of time agreed by the parties, provided that this service shall not relieve the Supplier any warranty obligations under this Contract; an

- (e) training of the Purchaser's personnel, at the Supplier's plant and/or on-site, in assembly, start-up, operation, maintenance and/or repair of the supplied Goods.

13.2 Prices charged by the Supplier for incidental services, if not included in the Contract Price for the Goods, shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged to other parties by the Supplier for similar services.

14. Spare Parts

14.1 As specified in the SCC, the Supplier may be required to provide any or all of the following materials, notifications, and information pertaining to spare parts manufactured or distributed by the Supplier:

- (a) such spare parts as the Purchaser may elect to purchase from the Supplier, providing that this election shall not relieve the Supplier of any warranty obligations under the Contract; and
- (b) In the event of termination of production of the spare parts:
 - (i) advance notification to the Purchaser of the pending termination, in sufficient time to permit the Purchaser to procure needed requirements; and
 - (ii) following such termination, furnishing at no cost to the Purchaser, the blueprints, drawings and specifications of the spare parts, if requested.

15. Warranty

15.1 The Supplier warrants that the Goods supplied under this Contract are new, unused, of the most recent or current models and that they incorporate all recent improvements in design and materials unless provided otherwise in the Contract. The Supplier further warrants that all Goods supplied under this Contract shall have no defect arising from design, materials workmanship (except when the design and/or material is required by the Purchaser's Specifications) or from any act or omission of the Supplier, that may develop under normal use of the supplied Goods in the conditions prevailing in the country of final destination.

15.2 This warranty shall remain valid for 12 months after the Goods or any portion thereof as the case may be, have been delivered to and accepted at the final destination indicated in the Contract, or for 18 months after the date of shipment from the place of loading whichever period concludes earlier, unless specified otherwise in the SCC.

15.3 The Purchaser shall promptly notify the Supplier in writing of any claims arising under this warranty.

15.4 Upon receipt of such notice, the Supplier shall, within the period specified in SCC and with

all reasonable speed, repair or replace the defective Goods or parts thereof, without cost to the Purchaser other than, where applicable, the cost of inland delivery of the repaired or replaced Goods or parts from ex-works or ex-factory or ex-showroom to the final destination.

- 15.5 If the Supplier, having been notified, fails to remedy the defect(s) within the period specified in SCC, the Purchaser may proceed to take such remedial action as may be necessary, at the Supplier's risk and expense and without prejudice to any other rights which the Purchaser may have against the Supplier under the Contract.

16. Payment

- 16.1 The method and conditions of payment to be made to the Supplier under this Contract shall be specified in the SCC.
- 16.2 The Supplier's request(s) for payment shall be made to the Purchaser in writing, accompanied by an invoice describing, as appropriate, the Goods delivered and the Services performed, and by documents, submitted pursuant to GCC Clause 10, and up on fulfillment of other obligations stipulated in the contract.
- 16.3 Payments shall be made promptly by the Purchaser but in no case later than sixty (60) days after submission of the invoice or claim by the Supplier.
- 16.4 Payment shall be made in Indian Rupees.

17. Prices

- 17.1 Prices charged by the Supplier for Goods delivered and Services performed under the Contract shall not vary from the prices quoted by the Supplier in its bid, with the exception of any price adjustments authorized in SCC or in the Purchaser's request for bid validity extension, as the case may be.

18. Change Orders

- 18.1 The Purchaser may at any time, by written order given to the Supplier pursuant to GCC Clause 31, make changes within the general scope of the Contract in any one or more of the following:
- (a) drawings, designs, or specifications, where Goods to be furnished under the Contract are to be specifically manufactured for the Purchaser;
 - (b) the method of shipping or packing;
 - (c) the place of delivery; and/or
 - (d) the Services to be provided by the Supplier.
- 18.2 If any such change causes an increase or decrease in the cost of, or the time required for, the Supplier's performance of any provisions under the Contract, an equitable adjustment shall be made in the Contract Price or delivery schedule, or both, and the Contract

shall accordingly be amended. Any claims by the Supplier for adjustment under this clause must be asserted within thirty (30) days from the date of the Supplier's receipt of the Purchaser's change order.

19. Contract Amendments

19.1 Subject to GCC Clause 18, no variation in or modification of the terms of the Contract shall be made except by written amendment signed by the parties.

20. Assignment

20.1 The Supplier shall not assign, in whole or in part, its obligations to perform under the Contract, except with the Purchaser's prior written consent.

21. Subcontracts

21.1 The Supplier shall notify the Purchaser in writing of all subcontracts awarded under this Contract if not already specified in the bid. Such notification, in his original bid or later, shall not relieve the Supplier from any liability or obligation under the Contract.

21.2 Subcontracts must comply with the provisions of GCC Clause 3.

22. Delays in the Supplier's Performance

22.1 Delivery of the Goods and performance of the Services shall be made by the Supplier in accordance with the time schedule specified by the Purchaser in the Schedule of Requirements.

22.2 If at any time during performance of the Contract, the Supplier or its sub-contractor(s) should encounter conditions impeding timely delivery of the Goods and performance of Services, the Supplier shall promptly notify the Purchaser in writing of the fact of the delay, likely duration and its cause(s). As soon as practicable after receipt of the Supplier's notice, the Purchaser shall evaluate the situation and may, at its discretion, extend the Supplier's time for performance with or without liquidated damages, in which case the extension shall be ratified by the parties by amendment of the Contract.

22.3 Except as provided under GCC Clause 25, a delay by the Supplier in the performance of delivery obligations shall render the Supplier liable to the imposition of liquidated damages pursuant to GCC Clause 23, unless an extension of time is agreed upon pursuant to GCC Clause 22.2 without the application of liquidated damages.

23. Liquidated Damages

23.1 Subject to GCC Clause 25, if the Supplier fails to deliver any or all of the Goods or to perform the Services within the period(s) specified in the Contract, the Purchaser shall,

without prejudice to its other remedies under the Contract, deduct from the Contract Price, liquidated damages, a sum equivalent to the percentage specified in SCC of the delivered price of the delayed Goods or unperformed Services for each week or part thereof of delay until actual delivery or performance, up to a maximum deduction of the Percentage specified in SCC. Once the maximum is reached, the Purchaser may consider termination of the Contract pursuant to GCC Clause 24.

24. Termination for Default

- 24.1 The Purchaser may, without prejudice to any other remedy for breach of contract, by written notice of default sent to the Supplier, terminate the Contract in whole or part:
- (a) if the Supplier fails to deliver any or all of the Goods within the period(s) specified in the Contract, or within any extension thereof granted by the Purchaser pursuant to GCC Clause 22; or
 - (b) if the Supplier fails to perform any other obligation(s) under the Contract
 - (c) if the Supplier, in the judgment of the Purchaser has engaged in fraud and corruption, as defined in GCC Clause 34, in competing for or in executing the Contract.
- 24.2 In the event the Purchaser terminates the Contract in whole or in part, pursuant to GCC Clause **24.1** the Purchaser may procure, upon such terms and in such manner as it deems appropriate, Goods or Services similar to those undelivered, and the Supplier shall be liable to the Purchaser for any excess costs for such similar Goods or Services. However, the Supplier shall continue the performance of the Contract to the extent not terminated.

25. Force Majeure

- 24.1 Notwithstanding the provisions of GCC Clauses 22, 23, 24, the Supplier shall not be liable for forfeiture of its performance security, liquidated damages or termination for default, if and to the extent that, its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.
- 24.2 If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such conditions and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means of performance not prevented by the Force Majeure event.

26. Termination for Insolvency

- 26.1 The Purchaser may at any time terminate the Contract by giving written notice to the Supplier, if the Supplier becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the Supplier, provided that such termination will not prejudice

affect any right of action or remedy which has accrued or will accrue thereafter to the Purchaser.

27. Termination for Convenience

- 27.1 The Purchaser, by written notice sent to the Supplier, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Purchaser's convenience, the extent to which performance of the Supplier under the Contract is terminated, and the date upon which such termination becomes effective.
- 27.2 The Goods that are complete and ready for shipment within 30 days after the Supplier's receipt of notice of termination shall be accepted by the Purchaser at the Contract terms and prices. For the remaining Goods, the Purchaser may elect:
- (a) to have any portion completed and delivered at the Contract terms and prices; and/or
 - (b) to cancel the remainder and pay to the Supplier an agreed amount for partially completed Goods and for materials and parts previously procured by the Supplier.

28. Settlement of Disputes

- 28.1 The Purchaser and the supplier shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.
- 28.2 If, after thirty (30) days, the parties have failed to resolve their dispute or difference by such mutual consultation, then either the Purchaser or the Supplier may give notice to the other party of its intention to commence arbitration, as hereinafter provided, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given
- 28.2.1 Any dispute or difference in respect of which a notice of intention to commence arbitration has been given in accordance with this Clause shall be finally settled by arbitration. Arbitration may be commenced prior to or after delivery of the Goods under the Contract.
- 28.2.2 Arbitration proceedings shall be conducted in accordance with the rules of procedure Specified in the SCC.
- 28.3 Notwithstanding any reference to arbitration herein,
- (a) the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree; and
 - (b) the Purchaser shall pay the Supplier any monies due the Supplier.

29. Limitation of Liability

- 29.1 Except in cases of criminal negligence or willful misconduct, and in the case of infringement pursuant to Clause 6,

- (a) the Supplier shall not be liable to the Purchaser, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Supplier to pay liquidated damages to the Purchaser; and
- (b) the aggregate liability of the Supplier to the Purchaser, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment.

30. Governing Language

- 30.1 The contract shall be written in English language. Subject to GCC Clause 30, English language version of the Contract shall govern its interpretation. All correspondence and other documents pertaining to the Contract which are exchanged by the parties shall be written in the same language.

31. Applicable Law

- 31.1 The Contract shall be interpreted in accordance with the laws of the Union of India.

32. Notices

- 32.1 Any notice given by one party to the other pursuant to this Contract shall be sent to other party in writing or by cable, telex or facsimile and confirmed in writing to the other Party's address specified in SCC.
- 32.2 A notice shall be effective when delivered or on the notice's effective date, whichever is later.

33. Taxes and Duties

- 33.1 Deleted.
- 33.2 Suppliers shall be entirely responsible for all taxes, duties, license fees, octroi, road permits, etc., incurred until delivery of the contracted Goods to the Purchaser.

34. Fraud and Corruption

- 34.1 It is the Bank's policy that Borrowers (including beneficiaries of Bank loans), as well as Bidders, Suppliers, and Contractors, and their agents (whether declared or not), personnel, subcontractors, sub-consultants, service providers and suppliers under Bank-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts[8]. In pursuance of this policy, the Bank:
 - (a) defines, for the purposes of this provision, the terms set forth below as follows:
 - (i) "corrupt practice"[9] means the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence the action of a public official in the procurement process or in contract execution;

- (ii) “fraudulent practice”[10] means a misrepresentation or omission of facts in order influence a procurement process or the execution of a contract;
 - (iii) “collusive practice” [11] means a scheme or arrangement between two or more Bidders, with or without the knowledge of the borrower, designed to establish bid prices at artificial, noncompetitive levels; and
 - (iv) “coercive practice” [12] means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the procurement process or affect the execution of a contract;
 - (v) “Obstructive practice” is
 - (aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge matters relevant to the investigation or from pursuing the investigation, or
 - (bb) acts intended to materially impede the exercise of the Bank’s inspection and audit rights provided for under sub – clause 34.1 (e) below.
 - (b) will reject a proposal for award if it determines that the Bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive or coercive practices in competing for the Contract in question;
 - (a) will cancel the portion of the loan allocated to a contract if it determines at any time that representatives of the Borrower or of a beneficiary of the loan engaged in corrupt, fraudulent, collusive or coercive practices during the procurement or the execution of that contract, without the Borrower having taken timely and appropriate action satisfactory to the Bank to address such practices when they occur;
 - (b) will sanction a firm or an individual, at any time, in accordance with prevailing Bank’s sanctions procedures [13], including by publicly declaring such firm or individual ineligible, either indefinitely or for a stated period of time, (i) to be awarded a Bank-financed contract; and (ii) to be a nominated [14] subcontractor, consultant, manufacturer or supplier, or service provider of and otherwise eligible firm being awarded a Bank-financed contract; and
 - (c) will have the right to require that a provision be included in Bidding Documents and in contracts financed by a Bank loan, requiring Bidders, Suppliers, and Contractors and their sub-contractors to permit the Bank to inspect their accounts and records and other documents relating to the bid submission and contract performance and to have them audited by auditors appointed by the Bank.
- 34.2 Furthermore, Bidders shall be aware of the provision stated in sub-clause 24.1 (c) of the General Conditions of Contract.

SECTION IV: SPECIAL CONDITIONS OF CONTRACT

SECTION IV: SPECIAL CONDITIONS OF CONTRACT

TABLE OF CLAUSES

Item No.	Topic	Page Number
1.	Definitions (GCC Clause 1)	41
2.	Country of Origin (GCC Clause 3)	41
3.	Performance Security (GCC Clause 7)	41
4.	Inspection and Tests (GCC Clause 8)	42
5.	Packing (GCC Clause 9)	42
6.	Delivery and Documents (GCC Clause 10)	42
7.	Insurance (GCC Clause 11)	43
8.	Incidental Services (GCC Clause 13)	43
9.	Spare Parts (GCC Clause 14)	43
10.	Warranty (GCC Clause 15)	44
11.	Payment (GCC Clause 16)	44
12.	Prices (GCC Clause 17)	45
13.	Sub-contracts (GCC Clause 21)	45
14.	Liquidated Damages (GCC Clause 23)	45
15.	Settlement of Disputes (GCC Clause 28)	45
16.	Notices (GCC Clause 32)	46
17.	Progress of Supply	46

Special Conditions of Contract

The following Special Conditions of Contract shall supplement the General Conditions of Contract. Whenever there is a conflict, the provisions herein shall prevail over those in the General Conditions of Contract. The corresponding clause number of the General Conditions is indicated in parentheses.

1. Definitions (GCC Clause 1)

- (a) The Purchaser is **Director, Sant Longowal Institute of Engineering and Technology, Longowal**
- (b) The Supplier is :

2. Country of Origin (GCC Clause 3)

All countries and territories as indicated in Section XIV of the bidding documents, “Eligibility for the Provisions of Goods, Works, and Services in Bank-Financed Procurement”.

3. Performance Security (GCC Clause 7)

- 3.1 Within 21 days after the Supplier’s receipt of Notification of Award, the Supplier shall furnish Performance Security to the Purchaser for an amount of 5% of the contract value, valid upto 60 days after the date of completion of performance obligations including warranty obligations.

In the event of any correction of defects or replacement of defective material during the warranty period, the warranty for the corrected/replaced material shall be extended to a further period of 12 months and the Performance Bank Guarantee for proportionate value shall be extended 60 days over and above the extended warranty period.

- 3.2 Substitute Clause 7.3 (b) of the GCC by the following:

A cashier’s cheque or banker’s certified cheque or crossed demand draft or pay order drawn in favour of **Director, Sant Longowal Institute of Engineering and Technology, Longowal** [Purchaser].

- 3.3 Substitute Clause 7.4 of the GCC by the following:

The Performance Security will be discharged by the Purchaser and returned to the Supplier **not later than 60 days** following the date of completion of the Supplier’s performance obligations, including the warranty obligation, under the contract.

- 3.4 Add as Clause 7.5 to the GCC the following:

In the event of any contract amendment, the Supplier shall, within 21 days of receipt of such amendment, furnish the amendment to the Performance Security, rendering the same valid for the duration of the Contract, as amended for 60 days after the completion of performance obligations including warranty obligations.

4. Inspection and Tests (GCC Clause 8)

The following inspection procedures and tests are required by the Purchaser:

- (i) The inspection of the Goods shall be carried out to check whether the Goods are in conformity with the technical specifications attached to the contract and shall be in line with the inspection/test procedures laid down in the Technical Specifications and the General Conditions of contract. Following broad test procedure will generally be followed in inspection and testing of machine.

The supplier will dispatch the goods to the ultimate consignee after internal inspection testing along with the supplier's inspection report and manufacturer's warranty certificate.

The purchaser will test the equipment after completion of the installation and commissioning at the site of the installation.

For site preparation, the supplier should furnish all details to the purchaser sufficiently in advance so as to get the works completed before receipt of the equipment.

Complete items/ accessories as specified in Section V should be supplied, installed and commissioned properly by the supplier prior to commencement of performance test.

- (ii) In the event of the equipment's failing to pass the acceptance test, a period not exceeding four weeks will be given to rectify the defects and clear the acceptance test, failing which the purchaser reserves the rights to get the equipment replaced by the supplier at no extra cost to the purchaser.

5. Packing (GCC Clause 9)

Add as Clause 9.3 of the GCC the following:

Packing Instructions: The Supplier will be required to make separate packages for each Consignee. Each package will be marked on three sides with proper paint/indelible ink, the following:

- (i) Project
- (ii) Contract No.
- (iii) Country of Origin of Goods
- (iv) Supplier's Name, and
- (v) Packing list reference number.

6. Delivery and Documents (GCC Clause 10)

Upon delivery of the Goods, the supplier shall notify the purchaser and the insurance company by cable/telex/fax the full details of the shipment including contract number, railway receipt number and date, description of goods, quantity, name of the consignee etc. The supplier shall mail the following documents to the purchaser with a copy to the insurance company:

- (i) 4 Copies of the Supplier invoice showing contract number, goods' description, quantity, unit

- price, total amount;
- (ii) Railway receipt/acknowledgment of receipt of goods from the consignee(s);
 - (iii) 4 Copies of packing list identifying the contents of each package;
 - (iv) Insurance Certificate ;
 - (v) Manufacturer's/Supplier's warranty certificate;
 - (iv) Inspection Certificate issued by the nominated inspection agency, and the Supplier's factory inspection report; and
 - (iV) Certificate of Origin.

The above documents shall be received by the Purchaser before arrival of the Goods (except where the Goods have been delivered directly to the Consignee with all documents) and, if not received, the Supplier will be responsible for any consequent expenses.

7. Insurance (GCC Clause 11)

For delivery of goods at site, the insurance shall be obtained by the Supplier in an amount equal to 110% of the value of the goods from "warehouse to warehouse" (final destinations) on "All Risks" basis including War Risks and Strikes.

8. Incidental Services (GCC Clause 13)

The following services covered under Clause 13 shall be furnished and the cost shall be included in the contract price:

- a. Performance of the onsite assembly, commissioning and start-up of the equipment.
- b. Furnishing the detailed operation and maintenance manuals for each items of the supply at each location.
- C. Training the purchaser personnel at the suppliers office or other facility, in the installation and operation of the equipment.
- d. Maintenance and repair of the equipment at each location during the warranty period including supply of all spares. This shall not relieve the supplier of any warranty obligation under this contract.
- e. Maintenance and/or repairs of the supplied goods for a period of three years after the end warranty period. The bidder should indicate the spares and their costs, if any, which are not indicated in the maintenance contracts.

9. Spare Parts (GCC Clause 14)

Add as Clause 14.2 to the GCC the following:

Supplier shall carry sufficient inventories to assure ex-stock supply of consumable spares for the Goods, such as gaskets, plugs, washers, belts etc. Other spare parts and components shall be supplied as promptly as possible but in any case within six months of placement of order.

10. Warranty (GCC Clause 15)

(i) G.C.C. Clause 15.2:

In partial modification of the provisions, the warranty period shall behours of operation or : months from date of acceptance of Goods or months from the dates of Shipment, whichever occurs earlier. The Supplier shall, in addition, comply with the performance and/or consumption guarantees specified under the contract. If for reasons attributable to the Supplier, these guarantees are not attained in whole or in part, the Supplier shall at its discretion either:

- (a) make such changes, modifications, and/or additions to the Goods or any part thereof as may be necessary in order to attain the contractual guarantees specified in the Contract at its own cost and expense and to carry out further performance tests in accordance with SCC 4 ;

(ii) Substitute Clause 15.4 of the GCC by the following:

“Upon receipt of such notice, the Supplier shall, within the period specified in SCC and with reasonable speed, repair or replace the defective goods or parts thereof, free of cost at the ultimate destination. The Supplier shall take over the replaced parts/goods at the time of their replacement. No claim whatsoever, shall lie on the Purchaser for the replaced parts/ goods thereafter.

In the event of any correction of defects or replacement of defective material during the warranty period, the warranty for the corrected/replaced material shall be extended to a further period of 12 months.”

(iii) GCC Clauses 15.4 and 15.5:

The period for correction of defects in the warranty period is 20 days.

11. Payment (GCC Clause 16)

Payment for Goods and Services shall be made in Indian Rupees as follows:

Satisfactory Acceptance:	100% of total cost
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Edit the above Payment Terms as per below sample.

- (i) *Advance Payment*: No advance payment.
- (ii) *On Delivery*: No payment; and
- (iii) *On Final Acceptance*: 100% of total cost shall be paid to the supplier within 30 days after the date the acceptance certificate issued by the Purchaser's representative for the respective delivery.

12. Prices (GCC Clause 17)

12.1 Prices payable to the supplier as stated in the contract shall be firm during the performance of the contract.

13. Sub-contracts (GCC Clause 21)

Add at the end of GCC sub-clause 21.1 the following:

Sub-contract shall be only for bought-out items and sub-assemblies

14. Liquidated Damages (GCC Clause 23)

14.1 For delays :

GCC Clause 23.1 -- The applicable rate is 0.01 % per week and the maximum deduction is 10 % of the contract price.

15. Settlement of Disputes (Clause 28)

The dispute settlement mechanism to be applied pursuant to GCC Clause 28.2.2 shall be as follows:

- (a) In case of Dispute or difference arising between the Purchaser and a domestic supplier relating to any matter arising out of or connected with this agreement, such disputes or difference shall be settled in accordance with the Arbitration and Conciliation Act, 1996. The arbitral tribunal shall consist of 3 arbitrators one each to be appointed by the Purchaser and the Supplier. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the Parties and shall act as Presiding arbitrator. In case of failure of the two arbitrators appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the arbitrator appointed subsequently, the Presiding Arbitrator shall be appointed by the Indian Council of Arbitration.
- (b) In the case of a dispute with a Foreign Supplier, the dispute shall be settled in accordance with provisions of UNCITRAL (United Nations Commission on International Trade Law) Arbitration Rules. The Arbitral Tribunal shall consist of three Arbitrators one each to be appointed by the Purchaser and the Supplier. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the Parties, and shall act as presiding arbitrator. In case of failure of the two arbitrators appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the arbitrator appointed subsequently, the Presiding Arbitrator shall be appointed by the Indian Council of Arbitration.
- (c) If one of the parties fails to appoint its arbitrator in pursuance of sub-clause (a) and (b) above, within 30 days after receipt of the notice of the appointment of its arbitrator by the other party, then the Indian Council of Arbitration both in cases of the Foreign supplier as well as Indian supplier, shall appoint the arbitrator. A certified copy of the order of the Indian

- Council of Arbitration making such an appointment shall be furnished to each of the parties.
- (d) Arbitration proceedings shall be held at India, and the language of the arbitration proceedings and that of all documents and communications between the parties shall be English.
 - (e) The decision of the majority of arbitrators shall be final and binding upon both parties. The cost and expenses of Arbitration proceedings will be paid as determined by the arbitral tribunal. However, the expenses incurred by each party in connection with the preparation, presentation etc. of its proceedings as also the fees and expenses paid to the arbitrator appointed by such party or on its behalf shall be borne by each party itself.
 - (f) Where the value of the contract is Rs. 10 million and below, the disputes or differences arising shall be referred to the Sole Arbitrator. The Sole Arbitrator should be appointed by agreement between the parties; failing such agreement, by the appointing authority namely the Indian Council of Arbitration.

16. Notices (Clause 32)

For the purpose of all notices, the following shall be the address of the Purchaser and Supplier.

Purchaser: Director, Sant Longowal Institute of Engineering and Technology, Longowal

Supplier: (To be filled in at the time of Contract signature)

.....
.....

17. Supplier shall regularly intimate progress of supply, in writing, to the Purchaser as under:

- a. Quantity offered for inspection and date;
 - b. Quantity accepted/rejected by inspecting agency and date;
 - c. Quantity dispatched/delivered to consignees and date;
 - d. Quantity where incidental services have been satisfactorily completed with date;
 - e. Quantity where rectification/repair/replacement effected/completed on receipt of any communication from;
 - f. Consignee/Purchaser with date
 - g. Date of completion of entire Contract including incidental services, if any; and
 - h. Date of receipt of entire payments under the Contract
- (in case of stage-wise inspection, details required may also be specified).

SECTION V: SCHEDULE OF REQUIREMENTS

SCHEDULE OF REQUIREMENTS

Brief Description	Quantity	Delivery schedule
Centre for Training and Research in Automation	Details at Annexure-I	

SECTION VI: TECHNICAL SPECIFICATIONS

Sr. No	Item Name	Specifications
1	Centre for Training and Research in Automation	Attached as Annexure-I

Notes for Preparing the Technical Specifications

A set of precise and clear specifications is a pre-requisite for bidders to respond realistically and competitively to the requirements of the Purchaser without qualifying their bids. In the context of National Competitive Bidding (NCB), the specifications must be drafted to permit the widest possible competition and, at the same time, present a clear statement of the required standards of workmanship, materials, and performance of the goods and services to be procured. Only if this is done will the objectives of economy, efficiency, and fairness in procurement be realized, responsiveness of bids be ensured, and the subsequent task of bid evaluation facilitated. Their specifications should require that all goods and materials to be incorporated in the goods be new, unused, and of the most recent or current models, and that they incorporate all recent improvements in design and materials unless provided for otherwise in the contract.

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Samples of specifications from previous similar procurements are useful in this respect. The use of metric units is encouraged by the Bank. Depending on the complexity of the goods and the repetitiveness of the type of procurement, it may be advantageous to standardize the General Technical Specifications and incorporate them in a separate sub-section. The General Technical Specifications should cover all classes of workmanship, materials, and equipment commonly involved in manufacturing similar goods, although not necessarily to be used in a particular procurement. Deletions or addenda should then adapt the General Technical Specifications to the particular procurement.

Care must be taken in drafting specifications to ensure that they are not restrictive. In the specification of standards for equipment, materials, and workmanship, recognized international standards should be used as much as possible. Where other particular standards are used, whether national standards or other standards, the specifications should state that equipment, materials, and workmanship that meet other authoritative standards, and which ensure at least a substantially equal quality than the standards

mentioned, will also be acceptable. The following clause may be inserted in the Special Conditions of Contract or the Technical Specifications.

Sample Clause :Equivalency of Standards and Codes

Where reference is made in the Technical Specifications to specific standards and codes to be met by the goods and materials to be furnished or tested, the provisions of the latest current edition or revision of the relevant standards or codes in effect shall apply, unless otherwise expressly stated in the Contract. Where such standards and codes are national or relate to a particular country or region, other authoritative standards that ensure substantial equivalence to the standards and codes specified will be acceptable.

Reference to brand name and catalogue number should be avoided as far as possible; where unavoidable they should always be followed by the words “or at least equivalent”.

Where appropriate, drawings including site plans as required, may be furnished by the Purchaser with the bidding documents. Similarly, the Supplier may be requested to provide drawings with its bid for prior review by the Purchaser during contract execution.

TENDER SPECIFICATIONS FOR **Establishing a Centre for Training and Research in Automation**

Project Overview and Objectives

The idea of setting up of Industry Linked Centre of Excellence/Advanced Lab in Automation originated from the need to align the engineering education with the latest industry trends and practices, better vocational training/ interaction with industry, upgradation of tools, laboratories and faculty skills as well as the inclusion of latest engineering concepts into the academic curriculum structure. Automation covers applications ranging from a household thermostat controlling a boiler, to a large industrial control system with tens of thousands of input measurements and output control signals. In control complexity, it can range from simple on-off control to multi-variable high-level algorithms. In the simplest type of an automatic control loop, a controller compares a measured value of a process with a desired set value, and processes the resulting error signal to change some input to the process, in such a way that the process stays at its set point despite disturbances. This closed-loop control is an application of negative feedback to a system. Automation has been achieved by various means including mechanical, hydraulic, pneumatic, electrical, electronic devices and computers, usually in combination. Complicated systems, such as modern factories, airplanes and ships typically use all these combined techniques. The benefit of automation include labor savings, savings in electricity costs, savings in material costs, and improvements to quality, accuracy and precision. The World Bank's World Development Report 2019 shows evidence that the new industries and jobs in the technological sector outweigh the economic effects of workers being displaced by automation. From the beginning of the industrial revolution robotics and automation becomes the most important part of manufacturing. Robotic arms, which are able to perform multiple tasks such as welding, cutting, lifting, sorting and bending, are used in industries. Keeping in view the recent advances in automation and need for professionals to get training in such recent trends in automation, a Centre for Training and Research in Automation is proposed with the following objectives.

Objectives:

- Bridge the gap between Industry needs and the available set of skills through Industry oriented learning.
- Enable SLIET, Longowal to improve the quality of technical education & training in the region.
- Provide state-of-the-art tools to match industry standards.
- Student Training on live projects from the Industry.
- Availability of learning modules with learner centric study material.
- Reduce investment of time, effort and money by the industry in the training of the students.
- Improve student employability.
- Improve industry competitiveness globally.

Expected Outcomes:

- Establish a state-of-art Centre for Training and Research in Automation at SLIET, Longowal.
- A complete learning solution that will build specific skills set and equip students with employable skills in manufacturing and allied sectors.
- Improved faculty & staff competency at SLIET.
- Promote Industry-academia partnership.
- Updated technical education curriculum that is more aligned with industry needs.
- Improved employability, which is mutually beneficial to the students proposed to be trained as well as the industry.
- Vocational training for skill enhancement of the youth of the region.

Scope of Engagement

(a) Scope of Engagement under Skill Development

1. Setting up of Centre for Training and Research in Automation.
2. Training of Trainers (deputed by SLIET) by bidder for one year through Master Trainers to make them fully competent to independently run the Centre.
3. Full responsibility for running the operations of Centre initially, followed by 3 year of handholding.
4. Maintenance of software and hardware and provision of software upgrades for at least the period of one years from the successful commissioning of the Centre. However, software upgrades and support will be provided even after the period of 1 years.
5. Opportunity to SLIET to impart paid training to its clients in the region.

(b) Scope of Work under Learning Program

1. Provision of training modules & providing IT enabled course material.
2. Providing need based Master trainers / faculty and skilled labor to run the training programs in the Centre for a period of 3 years.
3. Joint Certification of the candidates upon successful completion of training.
4. Conducting Seminars, Conferences, Workshops, Industry Conclaves, Industry Surveys, Industry meetings, Creating awareness or organizing placement activities.
5. Entrepreneurship development, supporting start up ecosystem, prototypes development, Assistance in R&D activities.

(c) Scope of work under SLIET

1. Physical Infrastructure to be provided by SLIET, Longowal.
 - Space for Labs including related civil works as required.
 - Flooring, Furniture and Fixtures
 - Air Conditioning
 - LAN connectivity
 - Power supply (including Backup)
 - Generator/ UPS Backup
 - Water
 - Running expenses for utilities
 - Security
2. Providing nodal person for the Centre and requisite faculty/staff for the laboratories.

NOTE: The requirements for above work, however, need to be specified by the successful bidder.

Lab equipment shall be purchased as a single unit including the following components:

S. No.	Brief Description and Specifications
1.	<p>BASIC + ADVANCED PNEUMATIC + ELECTRO PNEUMATIC TRAINING KIT (5Nos) consisting of <u>Pneumatic Trainer work bench : Qty - 5 Nos.</u> Work bench should be designed in such a way that allows two groups of students to work at the same time of the panel. The pneumatic and the electro-pneumatic components with which the students will work should be able to fit the panel. This should be further facilitated by the drawer units in order to ensure quick and easy access of the components to the students. It will be designed for electrical power supply and compressed air connections. -4 wheel support , with brake and high loading output</p>
	<p><u>Components for basic and advanced pneumatics ad electro-pneumatics Trainer Qty.- 5 sets</u> All of the components must be industrial. Each component must be mounted on a mild steel plate, which will include holding clips to be able to insert the components in the work panel. The mild steel plates should bear a label identifying the component in question, including its reference number and ISO symbols. All of the components will include silencers and one-touch fittings for 4mm tubing. The electric and/or electro pneumatic components will include all of the necessary cables with instant connections for 2mm-diameter power jacks. All of the pneumatic components must be lubricated, which must last throughout their service life without the need for lubricators. The basic & advanced pneumatic trainer should be capable to demonstrate the design, construction and application of pneumatics components and circuits. The kit shall be capable of being used to demonstrate:</p> <ul style="list-style-type: none"> • Design and function of a pneumatic system • Function and identification of pneumatic components and their symbols • Design of controls (logic, Memory, time & pressure dependent, intermediate position etc • Logic AND / OR function to start signals • Application and fault findings of pneumatic controls • Functional diagrams • Reading complex circuit with step diagram • Signal overlapping and methods of signal cut-off • Sequential design and supplementary conditions • Systematic fault finding in complex pneumatic control systems and correction • Pneumatic safety. <p><u>Pneumatic Trainer Kit Equipment Set:</u> Each set shall comprise of the following components / systems Storage drawer block for rolling table with lock : Qty - 2 Nos Compact drawer block with slide guides to house the trays of components Lockable with key Power Supply : Qty - 2 Nos. Input Voltage: 220V/110V Output: 24V/2,5A Protection against short circuits Input switch and LED display Supply cable included Air Cleaning unit with distribution valve : Qty - 2 Nos.</p>

	<p>Port size 1/4 inch</p> <p>Maximum Flow rate: 800 l/min</p> <p>Maximum operating pressure: 10 bar</p> <p>Filtration – 05 microns</p> <p>Connection for tube 6 dia input and 4 dia output</p> <p>it will include Filter, a Regulator with 1 Mpa Pressure Gauge, 3/2 discharge valve with silencer for connection and disconnection of the rest of the circuit.</p> <p>Possibility of vertical and horizontal positioning</p> <p>Mounting – Turn to lock / Unlock mechanism with slot stone indicator knob.</p> <p>Distribution block with distribution valve: Qty - 2 Nos.</p> <p>It will include 8-outlet distribution block, one touch fittings and non return system.</p> <p>Direct coupling to the air cleaning unit</p> <p>4mm Dia od for input and output</p> <p>Maximum pressure - 10 bar</p> <p>Double 3/2 NC valve, operated by push button : Qty - 6 Nos.</p> <p>Type – 3/2 Normally closed position spring return</p> <p>Push button colour Red and Black</p> <p>Push button – Flush head type</p> <p>Design – Spool type</p> <p>Size – 04mm outer dia. tube connection</p> <p>Working pressure range : 7 bar</p> <p>Mounting – Turn to lock / Unlock mechanism with slot stone indicator knob.</p> <p>3/2 NC valve, operated by roller lever : Qty - 12 Nos.</p> <p>Type – Mechanical roller action, spring return</p> <p>Size – 04mm outer dia tube connection</p> <p>Maximum pressure – 7 bar</p> <p>Mounting – Turn to lock / Unlock mechanism with slot stone indicator knob</p> <p>3/2 NC switch-operated double valve : Qty - 2 Nos.</p> <p>Type – 3/2port valve with locking system</p> <p>Size – 04mm outer dia tube connection</p> <p>Maximum pressure – 7 bar</p> <p>Mounting – Turn to lock / Unlock mechanism with slot stone indicator knob</p> <p>5/2 valve with 2-position selector : Qty - 2 Nos.</p> <p>Power-assisted valve driven by a locking switch with silencer</p> <p>Size – 04mm outer dia tube connection</p> <p>Maximum pressure – 7 bar</p> <p>Mounting – Turn to lock / Unlock mechanism with slot stone indicator knob</p> <p>3/2 NC/NO, air operated single valve : Qty - 3 Nos.</p> <p>It will include 3/2 valve which convert NO to NC as required.</p> <p>Spring return, manually action facility</p> <p>Size – 04mm outer dia tube connection</p> <p>Maximum pressure – 7 bar</p> <p>Mounting – Push to lock /Unlock mechanism</p> <p>3/2 NC convertible valve : Qty - 1 No.</p> <p>It will include Basic timer , convertible from NC to NO</p> <p>Timing range 0 – 5s</p> <p>Spring return</p> <p>It will include silencer & speed controller</p> <p>Size – 4mm outer dia tube connection</p> <p>Minimum & Maximum pressure – 2 6 bar</p> <p>Mounting – Push to lock /Unlock mechanism</p>
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<p>Air operated 5/2 single valve : Qty - 3 Nos. Spring return pneumatic pilot Manual operation facility It will include with silencer Size – 04mm outer dia tube connection Design – Spool type spring return Pressure range – 0.15 – 7 bar Mounting – Push to lock /Unlock mechanism Air operated 5/2 double valve double piloting with memory function & possibility of manual operation : Qty - 10 Nos. Size – 04mm outer dia tube connection Design – Spool type spring return Pressure range – 0.15 – 7 bar It will include silencer Mounting – Push to lock /Unlock mechanism Double "OR" valve : Qty - 5 Nos. It will include double circuit selector with logic function "OR" Mounting – Push to lock /Unlock mechanism AND function : Qty - 5 Nos. It will Includes a doublesimultaneous valve with a logic function "AND" Mounting – Push to lock /Unlock mechanism Single direction speed controller (double) : Qty - 10 Nos. It will Include two single direction speed controllers, operate manually Size – 4mm dia tube Type – Inline Pressure range – 1 to 10 bar Quick exhaust valve : Qty - 2 Nos. It will Includes a free exhaust valve with silencer Size – 4mm dia tube Pressure range – 1 to 10 bar Mounting – Push to lock /Unlock mechanism Single acting cylinder : Qty - 1 No. Rod normally retracted Material – stainless steel construction End cushioning: Rubber cushioning Bore –20 dia (min) Stroke – 50 mm (min) Type – Miniature cylinder Maximum pressure – 10 bar Mounting – Turn to lock / Unlock mechanism with slot stone indicator knob. Double acting cylinder: Qty - 7 Nos. Material – Stainless steel construction Bore– 20 dia (min) Stroke – 100 mm (min) Size - 4 mm dia tube Type – Miniature cylinder (Magnetic with Reed Switch) Maximum pressure – 10 bar End cushioning: Rubber cushioning Mounting – Turn to lock / Unlock mechanism with slot stone indicator knob. Polyurethane tube 10 mtr. each colour set of 4 mm exterior diameter for connections on pneumatic circuits. : Qty - 3 Sets. Maximum pressure – 10 bar</p>

	<p>Colour : Blue , Black. Red. Green</p> <p>TEE fittings : Qty - 3 Sets.</p> <p>Union T fitting : – Set of 10 one-touch fittings</p> <p>Size – 4mm outer dia. tube</p> <p>Material – Plastic body</p> <p>Maximum pressure – 10 bar</p> <p>Set of 10 x 4mm plastic plugs: Qty - 2 Sets.</p> <p>Tool for plugging pressure outlets in 4mm tube</p> <p>Material – Plastic body</p> <p>Maximum pressure – 10 bar</p> <p>Pressure Indicator</p> <p>It will include a green optical gauge with a display angle of 180deg</p> <p>Size : 4mm dia tube</p> <p>Mounting – Turn to lock / Unlock mechanism with slot stone indicator knob.</p> <p>Tube Cutte tool : Qty - 1 No.</p>
	<p><u>Electro Pneumatic trainer kit - Quantity - 5Nos.</u></p> <p>Add on basic & advanced electro pneumatic trainer should be capable to demonstrate the design, construction and application of pneumatics components and circuits.</p> <p>The kit shall be capable of being used to demonstrate:</p> <ul style="list-style-type: none"> • Application and function of 3/2 and 5/2 valves • latching circuits • Relay Logic operations: AND /OR /NOT • Combining logic operations • Function and application of electrical limit switches • End position monitoring • Realising oscillating movement • Electrical safety requirements • Economic and technical aspects of using electro pneumatic components • Trouble shooting of simple electro pneumatic circuits • Sequence Controls with opposing signal • Special circuit for industrial applications <p><u>Add on components for basic & advanced electro pneumatic trainer:</u></p> <p>Quick exhaust valve : Qty - 2 Nos.</p> <p>It will Includes a free exhaust valve with silencer</p> <p>Size – 4mm dia tube</p> <p>Pressure range – 1 to 10 bar</p> <p>Mounting – push to lock / Unlock mechanism</p> <p>Single direction speed controller (double) : Qty - 10 Nos.</p> <p>It will include two single direction speed controllers, operated manually.</p> <p>Size – 4mm dia tube</p> <p>Type – Inline</p> <p>Pressure range – 1 to 10 bar</p> <p>Single acting cylinder : Qty - 1 No.</p> <p>Rod normally retracted</p> <p>Material – Stainless steel construction</p> <p>End cushioning: Rubber cushioning</p> <p>Bore –20 dia (min)</p> <p>Stroke – 50 mm (min)</p> <p>Type – Miniature cylinder</p> <p>Maximum pressure – 10 bar</p>

<p>Mounting – Turn to lock / Unlock mechanism with slot stone indicator knob.</p> <p>Double acting cylinder adjustable air cushion with builtin rail for magnetic detection : Qty - 7 Nos.</p> <p>Material – Stainless steel construction</p> <p>Bore – 20 dia (min)</p> <p>Stroke – 100 mm (min)</p> <p>Size - 4mm dia tube</p> <p>Type – Miniature cylinder (Magnetic with Reed Switch)</p> <p>Maximum pressure – 10 bar</p> <p>End cushioning: Rubber cushioning</p> <p>Mounting – Turn to lock / Unlock mechanism with slot stone indicator knob.</p> <p>5/2 Single solenoid valve : Qty - 2 Nos.</p> <p>Low consumption 0, 55 W</p> <p>LED display and surge absorber</p> <p>Design – Spring and air reset</p> <p>Power-assisted system</p> <p>Includes silencer & fittings 4mm od</p> <p>4mm banana plugs for electric connections</p> <p>5/2 Double solenoid valve Low consumption , LED display and surge absorber : Qty - 6 Nos.</p> <p>Low consumption 0, 55 W</p> <p>LED display and surge absorber</p> <p>Design – Spring and air reset</p> <p>Power-assisted system</p> <p>Includes silencer & fittings 4mm od</p> <p>4mm banana plugs for electric connections</p> <p>Button pad with three push buttons : Qty - 4 Sets.</p> <p>4mm safety terminals for use with connections wiring</p> <p>Two push-buttons and a locking pushbutton.</p> <p>Independent light indicator.</p> <p>Two push-button switch contacts</p> <p>Push button colour – Red, Green, Blue.</p> <p>Mounting - Push to lock/unlock mechanism</p> <p>Set of 3 relays with active LED : Qty - 5 Sets.</p> <p>It will include three relays with 24V coil and 4 switchable contacts</p> <p>Relay-active LED</p> <p>4mm safety terminals for use with connections wiring</p> <p>Mounting - Push to lock/unlock mechanism</p> <p>Indicator (Pilots , buzzer) 8 pilot lights and a buzzer : Qty - 2 Nos.</p> <p>Supplementary Terminals for power distribution</p> <p>4mm safety terminals for use with connections wiring</p> <p>Mounting - Push to lock/unlock mechanism</p> <p>Electrical end of stroke : Qty - 8 Nos.</p> <p>It will include Roller-driven end of stroke with switchable electric contact.</p> <p>4mm safety terminals for use with connections wiring.</p> <p>Mounting – Turn to lock / Unlock mechanism with slot stone indicator knob.</p> <p>Set of connection cables : Qty - 2 Sets.</p> <p>It will include 50x 2mm (diameter) snap connection cables with different colours and lengths.</p> <p>Cable colours – Red, black & Blue</p> <p>Connector type – 4mm banana plug</p> <p>Set of 2-Timer : Qty - 1 No.</p>
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	<p>It will include two timer relays, one for connection and the other for disconnection 24V Coil, with switch contact LED display of timer status Time programmable between 0.1 s and 1 h Connection type 4mm banana plug Mounting - Push to lock/unlock mechanism 4mm safety terminal for use with connections wiring Electric counter : Qty - 1 No. It will include inputs for counting and discounting Power supply: 24VDC Electromechanical preselection Manual or electrical reset Switch contact Connection type 4mm banana plug Display : 6 digits LCD display Mounting – Push to Lock/ Unlock mechanism 4mm safety terminals for use with connections wiring Photoelectric Detector : Qty - 2 Nos. It will M18 reflection photoelectric detector Detection Distance : 100 mm Sensor Display –LED Operating Voltage: 24V. Connector Type : quick connection cable QD connector Mounting – Push to Lock/ Unlock mechanism Programmable digital vacuum pressure switch. Analog / digital outputs : Qty - 1 No. Operating Voltage: 24V. Consumption: 45mA Pr. Range: 1 to 0.1 mpa 3 numerical digit PNP output with snap connection cables Size – 4mm dia tube. Polyurethane tube 10 mtr. each colour set of 4 mm exterior diameter for connections on pneumatic circuits. : Qty - 3 Sets. Maximum pressure – 10 bar Colour : Blue , Black. Red. Green TEE fittings : Qty - 2 Sets. Union T fitting : – Set of 10 one-touch fittings Size – 4mm outer dia tube Material – Plastic body Maximum pressure – 10 bar Set of 10 x 4mm plastic plugs : Qty - 2 Sets. Tool for plugging pressure outlets in 4mm tube. Material – Plastic body Maximum pressure – 10 bar</p>
2.	<p>Training Kit PLC- Module : Qty-2 sets Add on Supplementary equipment set to perform experiments related to automation with PLC. This module will help to cover following activities</p> <ul style="list-style-type: none"> • Benefits of PLC compared to conventional solutions • Functions of systems components of PLC • Commissioning of PLC

	<ul style="list-style-type: none"> • Sequence control and parallel logic • Systematic programming of a PLC <p>Each unit will consist of following components Brand: Mitsubishi PLC, Ac 100240V 12 Inputs & 8 outputs With programming cable and software Should be able to mount on profile plate of basic pneumatics kit Operating voltage – 24V DC PLC Type – PLC with 12DI, 8DO Connection type – 4mm banana plug, Mounting - Push to Lock / Unlock</p>
3.	<p><u>PICK AND PLACE DEMO KIT : Qty - 1 Set.</u></p> <p>The equipment should be capable to demonstrate concept of automation in pick and place of components in industry. All of the components used to build the Pick and Place demo kit must be industrial.</p> <p>The equipment should include:</p> <p>Control Panel:</p> <ul style="list-style-type: none"> - Power On OFF button - Selector switch to select auto or manual operation - Green start button - Red stop button - Reset button - Emergency stop button <p>Air treatment unit:</p> <ul style="list-style-type: none"> - The equipment should include an air treatment unit comprising a 5 µm filter with a pressure regulator, 10 bar pressure gauge, manual 3/2 stop valve, drain valve and silencer. <p>Documentation:</p> <p>The equipment will come with a set of hardcopy documentation, consisting of:</p> <ul style="list-style-type: none"> - Technical system description. - Pneumatic drawings. - Electrical drawings. - Mechanical assembly drawings. - Specifications for all of the industrial components. <p>Pick and Place Demo Kit will be provided fully assembled, programmed and tested.</p> <p>Operation:</p> <p>In auto mode: Complete cycle will be repeated until barrel is unloaded.</p> <p>In manual mode: Only one cycle will be run by pressing the start button.</p> <p>The function of the equipment will consist of:</p> <p>Manual loading a part in barrel.</p> <p>Use of proximity sensor to sense the work piece</p> <p>Pushing work piece to demonstrate movement with linear cylinder, sensing final position of linear cylinder by proximity sensor and retraction of linear cylinder.</p> <p>Movement of vertical guide cylinder and gripping the work piece with gripper for demonstration of pick up operation.</p> <p>Retraction of guide cylinder to lift the work piece.</p> <p>Rotate the work piece with gripper and rotary actuator at 90deg to place the work piece in required location.</p> <p>Release the work piece from gripper fingers to place at required location.</p> <p>The equipment will be mounted on a anodized aluminium desktop base. The following modules will be fitted on this base:</p> <p>Barrel & pusher module:</p>

	<p>This module will have a gravity feeder in which the anodised aluminium parts will be stored on top of each other, so that when the part at the bottom of the pile is feed the rest fall down due to gravity. The part at the bottom of the pile will be removed using a pneumatic cylinder The components in this module will have the following characteristics:</p> <ul style="list-style-type: none"> - Barrel block storage capacity: minimum 08 parts. <p>Actuators:</p> <ul style="list-style-type: none"> - 1 double acting pneumatic pusher cylinder, Ø16 and 100mm stroke, with speed controllers and initial and final position switches and controlled by a double 5/2 solenoid valve. <p>Sensors:</p> <ul style="list-style-type: none"> - 2 auto switches, PNP Reed type <p>Pick and place module</p> <p>Actuators:</p> <ul style="list-style-type: none"> - 1 Pneumatic guide cylinder, Ø12and 30mm stroke, with speed controllers and final position switches and controlled by a double 5/2 solenoid valve. - 1 Pneumatic gripper, Ø16mm, with speed controllers and final position switches and controlled by a double 5/2 solenoid valve. - 1 Rotary actuator, Ø10mm, with speed controllers and final position switches and controlled by a double 5/2 solenoid valve. <p>Sensors:</p> <ul style="list-style-type: none"> - 2 auto switches, PNP Reed type. - 2 Proximity Sensor <p>Electrical control panel:</p> <p>PLC</p> <p>Wired and programmed control PLC for automatic/manual operation. This PLC will have at least 16 digital inputs including push buttons, and 10 digital outputs, 24VDC implemented, i.e. connected to the hardware.</p> <p>All of the pneumatic tubing and wiring must be properly identified and labelled at both ends</p>
4.	<p><u>SORTING DEMO KIT : Qty - 1 Set.</u></p> <p>The equipment should be capable to demonstrate concept of automation in sorting of components in industry. All of the components used to build the Sorting demo kit must be industrial.</p> <p>The equipment should include:</p> <p>Control panel:</p> <ul style="list-style-type: none"> - Power On off button - Selector switch to select auto or manual operation - Green start button - Red stop button - Reset button - Emergency stop button <p>Air treatment unit:</p> <p>The equipment should include an air treatment unit comprising a 5 µm filter with a pressure regulator, 10 bar pressure gauge, manual 3/2 stop valve ,drain valve and silencer.</p> <p>Documentation:</p> <p>The equipment will come with a set of hardcopy documentation, consisting of:</p> <ul style="list-style-type: none"> - Technical system description. - Pneumatic drawings. - Electrical drawings. - Mechanical assembly drawings. - Specifications for all of the industrial components. <p>Sorting Demo Kit will be provided fully assembled, programmed and tested.</p> <p>Operation:</p>

	<p>In auto mode: Complete cycle will be repeated until barrel is unloaded.</p> <p>In manual mode: Only one cycle will be run by pressing the start button.</p> <p>The function of the equipment will consist of:</p> <p>Manual loading a part in barrel.</p> <p>Use of proximity sensor to sense the work piece</p> <p>Pushing work piece to demonstrate movement with linear cylinder, sensing final position of linear cylinder by reed switch and retraction of linear cylinder.</p> <p>Another proximity sensor will sense part is metallic or non-metallic.</p> <p>If part is metallic linear cylinders will push the metallic part for collection in bin 2.</p> <p>If part is non-metallic linear cylinder will not extend and let the non-metallic part pass for collection in another bin 1.</p> <p>The equipment will be mounted on anodized aluminium desktop base. The following modules will be fitted on this base:</p> <p>Barrel module:</p> <p>This module will have a gravity feeder in which the anodised aluminium parts will be filled on top of each other, so that when the part at the bottom of the pile is fed the rest fall down due to gravity. The part at the bottom of the pile will be removed using a pneumatic cylinder. The components in this module will have the following characteristics:</p> <ul style="list-style-type: none"> - Storage capacity: minimum 08 parts. <p>Actuators:</p> <ul style="list-style-type: none"> - 1 double acting pneumatic pusher cylinder, Ø16 and 50mm stroke, with speed controllers and initial and final position switches and controlled by a double 5/2 solenoid valve. <p>Sensors:</p> <ul style="list-style-type: none"> - 2 auto switches, PNP Reed type. <p>Sorting module</p> <p>Actuators:</p> <ul style="list-style-type: none"> - 1 double acting pneumatic cylinder, Ø16 and 75mm stroke, with speed controllers and final position switches and controlled by a double 5/2 solenoid valve. <p>Sensors:</p> <ul style="list-style-type: none"> - 2 auto switch, PNP Reed type. - 2 Proximity sensor – one to sense the component & second to sense the metal part. <p>Separate bins to store sorted components.</p> <p>Electrical control panel:</p> <p>Wired and programmed control PLC for automatic/manual operation. This PLC will have at least 16 digital inputs including push buttons, and 10 digital outputs implemented, i.e. connected to the hardware.</p> <p>All of the pneumatic tubing and wiring must be properly identified and labelled at both ends.</p>
5.	<p><u>STAMPING DEMO KIT : Qty - 1 Set.</u></p> <p>The equipment should be capable to demonstrate concept of automation in stamping of components in industry. All of the components used to build the stamping demo kit must be industrial.</p> <p>The equipment should include:</p> <p>Control panel:</p> <ul style="list-style-type: none"> - Power on off button - Selector switch to select auto or manual operation - Green start button - Red stop button - Reset button - Emergency stop button

	<p>Air treatment unit: The equipment should include an air treatment unit comprising a 5 µm filter with a pressure regulator, 10 bar pressure gauge, manual 3/2 stop valve, drain valve and silencer.</p> <p>Documentation: The equipment will come with a set of hardcopy documentation, consisting of:</p> <ul style="list-style-type: none"> - Technical system description. - Pneumatic drawings. - Electrical drawings. - Mechanical assembly drawings. - Practice activities. - Specifications for all of the industrial components. <p>Stamping Demo Kit will be provided fully assembled, programmed and tested.</p> <p>Operation: In auto mode: Complete cycle will be repeated until barrel is unloaded. In manual mode: Only one cycle will be run by pressing the start button. The function of the equipment will consist of : Manual loading a part in barrel. Use of proximity sensor to sense the work piece on barrel. Pushing work piece to demonstrate movement with linear cylinder, sensing final position of linear cylinder by reed switch and retraction of linear cylinder. Movement of vertical linear cylinder for demonstration of stamping operation and retract and position sensing by reed switch. Pushing the work piece with linear cylinder after stamping and cylinder position will be confirmed by reed switch & PLC get signal. Proximity sensor – sense the component at stamping position. The equipment will be mounted on an anodized aluminium desktop base. The following modules will be fitted on this base:</p> <p>Barrel module: This module will have a gravity feeder in which the anodised aluminium parts will be filled on top of each other, so that when the part at the bottom of the pile is fed the rest fall down due to gravity. The part at the bottom of the pile will be removed using a pneumatic cylinder The components in this module will have the following characteristics:</p> <ul style="list-style-type: none"> - Storage capacity: minimum 08 parts. <p>Actuators:</p> <ul style="list-style-type: none"> - 1 double acting pneumatic pusher cylinder, Ø16 and 100mm stroke, with speed controllers and initial and final position switches and controlled by a double 5/2 solenoid valve. <p>Sensors:</p> <ul style="list-style-type: none"> - 2 auto switches, PNP Reed type. - 1 Proximity sensor – Sense the component <p>Stamping module</p> <p>Actuators:</p> <ul style="list-style-type: none"> - 1 double acting pneumatic cylinder, Ø32 and 50mm stroke, with speed controllers and final position switches and controlled by a double 5/2 solenoid valve. <p>Sensors:</p> <ul style="list-style-type: none"> - 2 auto switch, PNP Reed type. - 1 Proximity sensor – before stamping confirm the component <p>Displacement module Once the stamping operation has been carried out, this module will displace the part to an unloading area. The part will be displaced by a pneumatic cylinder that will push stamped anodised aluminium part. The components in this module will have the following characteristics:</p>
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	<p>Actuators:</p> <ul style="list-style-type: none"> - 1 rectangular pneumatic pusher cylinder, Ø16 and 50mm stroke, with speed controllers and final position switches and controlled by a double 5/2 solenoid valve. <p>Sensors: - 2 auto switch, PNP Reed type.</p> <p>Electrical control panel:</p> <p>Wired and programmed control PLC for automatic/manual operation. This PLC will have at least 16 digital inputs including push buttons, and 10 digital outputs implemented, i.e. connected to the hardware.</p> <p>All of the pneumatic tubing and wiring must be properly identified and labelled at both ends.</p>
6.	<p><u>VACUUM TECHNOLOGY : Qty - 1 Set.</u></p> <p>All of the components must be industrial.</p> <p>All of the components will include silencers and fittings with instant connections for 6mm tubing.</p> <p>This kit shall be capable to demonstrate the following:</p> <ul style="list-style-type: none"> • Development of skills related to vacuum technology • Sizing and setting up of vacuum system • Function and use of vacuum ejectors • Selection of vacuum pad • Understanding different pad material suitable for different applications • Selection of vacuum ejectors • Sizing ejectors to work in systems where leakage is present between vacuum pad and work piece. • Using vacuum switch to monitor vacuum level • Designing, analysis of circuits using vacuum and trouble shooting. <p>SYSTEM COMPONENT SPECIFICATIONS</p> <p>The system will consist of two stratified panels, panels A and B, and a set of vacuum pads and components The components included on panels A and B will be held in place on the work panel by clips and will bear ISO symbols identifying them.</p> <p>The panel fixing system for the panels described below must be compatible with an extruded aluminium panel with 8.5mm slots.</p> <p>PANEL A: QUANTITY: 1.</p> <p>It will include:</p> <ul style="list-style-type: none"> • Foot mounted reservoir with non-return fittings - Quantity 1 No. • Solid state compact vacuum pressure switches -Quantity 2 Nos. • Digital vacuum pressure switch with fault prediction function- Quantity 1 No. • 24 VDC timer - Quantity 1 No. • Programmable digital vacuum pressure switches Quantity 2 Nos. • Pressure gauge with electrical contact switch for vacuum 1 Quantity 1 No. <p>PANEL B: QUANTITY: 1.</p> <p>It will include:</p> <ul style="list-style-type: none"> • Multiphase vacuum ejector Quantity 1 No. • Vacuum unit with ejector, valves, vacuum pressure switch and filter Quantity 1 No. • Compact vacuum ejector Quantity 1 No. • 3/2 elastic runner solenoid valve Quantity 1 No. • Vacuum module with ejector, valves, vacuum pressure switch and filter Quantity 1 No. • Vacuum unit with ejector, timed valves, vacuum pressure switch and filter Quantity 1 No. • Vacuum Regulator with pressure gauge Quantity 1 No. • Air suction filter for vacuum Quantity 1 No.

	<p>SET OF VACUUM PADS: QUANTITY: 1. COMPRISING:</p> <ul style="list-style-type: none"> · Flat NBR vacuum pad with ridges. Quantity 1 No. · Silicone vacuum pad with gaiter. Quantity 1 No. · Urethane rubber vacuum pad with gaiter. Quantity 1 No. · Fluorine rubber vacuum pad with gaiter. Quantity 1 No. · Flat NBR vacuum pad with joint. Quantity 1 No. · Flat NBR vacuum pad with telescope. Quantity 1 No. · Deep/concave NBR vacuum pad with telescope. Quantity 1 No <p>Other Elements:</p> <p>Tube cutter tool Quantity 1 No</p>
7.	<p><u>TRANSPARENT HYDRAULICS / ELECTROHYDRAULICS TRAINER : Qty - 2 Set.</u></p> <p>Work benches should be designed in such a way that allows two groups of students to work at the same time on either side of the panel. The system will consist of an extruded aluminium panel with slots on both sides, which will allow two groups of students to work at the same time on either side of the panel. The hydraulic and electrohydraulic components with which the students will work will be fitted on the panel.</p> <p>This should be further facilitated by two drawer units in order to ensure quick and easy access of components to students.</p> <p>It will be designed for electrical power supply and compressed air connections.</p> <p>4-wheel support, with brake and high loading output.</p> <p>All of the components will be formed by a prismatic body made of transparent methacrylate with metal industrial parts on the inside. Each component must be mounted on a plate, which will include holding clips to be able to insert the components in the work panel. The plates will bear a metal label identifying the component in question, including its reference number and ISO symbols.</p> <p>Hydraulic trainer should be capable to demonstrate following:</p> <p>Design and function of a Hydraulic System, Electro hydraulic system</p> <p>Design and Function of manual operated valves and solenoid valve</p> <p>Symbols according to international standards.</p> <p>Basic Circuit Diagrams on practical applications</p> <p>Basic Circuit Diagrams on practical applications, Hydraulic energy, Electrical logics AND/OR</p> <p>Reading and understanding technical data</p> <p>Interpretation of measurement results</p> <p>Trouble shooting</p> <p>Interpretation of measurement results</p> <p>Analytical fault finding</p> <p>Control technology with position, sequence and pressure control</p> <p>Hydraulic controls with pilot operated valves</p> <p>Hydraulic reservoirs, flow distributors</p> <p>Basic principles of analogue processing</p> <p>SYSTEM COMPONENT SPECIFICATIONS</p> <p>Work bench with twin-post : Qty - 1 No.</p> <ul style="list-style-type: none"> - The system will consist of an extruded aluminium panel with slots to fix the components. - The entire rolling frame may be disassembled for transportation. - It will be designed for electrical power supply and compressed air connections. - 4-wheel support, with brake and high loading output. <p>Storage drawer block for rolling table with lock : Qty - 1 No.</p> <ul style="list-style-type: none"> - Compact 4-drawer block with slide guides to house the trays of components. - Postformed material with ergonomically-designed pull devices

<ul style="list-style-type: none"> - Lockable with key. <p>Portable hydraulic pump for transparent hydraulic : Qty - 1 No.</p> <ul style="list-style-type: none"> - Transparent tank holding 6 litres. - Single-phase motor 0.12 Kw, 220v, 50Hz. - Gear pump. Q= 1 l/min. - Start - stop switch. - Filling lid and filter. - Pressure relief valve, Pmax: 10 bar. - Pressure gauge with diameter 40 mm, with scale from 0 to 16 bar. - 3 quick connector couplings (P + 2T) - Power supply cable, length of 3 metres, with single-phase plug. - Air bubble insertion system in the circulation oil. - Does not include oil drum <p>Oil with special red colouring : Qty - 1 No.</p> <ul style="list-style-type: none"> - Specially coloured oil for using with transparent elements. - Quantity required for portable hydraulic pump <p>BATCH OF COMPONENTS AND ACCESSORIES:</p> <p>TRANSPARENT HYDRAULICS COMPOSITION – LEVEL I : Qty - 1 No.</p> <p>General features:</p> <ul style="list-style-type: none"> - All the hydraulic components will use anti-leakage quick NW4 plugs self-sealing 1/8". - All the components that should have, will be mounted on a base plate. - Each of these components will include a fixing system to the assembly panel, with a specific design based on POM material (state-of-the-art polymer with self-lubricating properties, resistant to deformation, wear and ageing). - All of the components will be formed by a prismatic body made of transparent methacrylate with metal industrial parts on the inside. <p><u>COMPRISING THE FOLLOWING COMPONENTS AND QUANTITIES:</u></p> <p>Double acting cylinder : Qty - 1 No.</p> <ul style="list-style-type: none"> - Double acting cylinder D20/D10 x 58mm of stroke. - Pmax: 10 bar - In a prismatic body made of transparent methacrylate and with metal industrial parts on the inside. - On a base plate with two NW4 plugs self-sealing 1/8". <p>4/2 Directional control valve, manually operated : Qty - 1 No.</p> <ul style="list-style-type: none"> - Manually-operated and spring return. - Pmax: 10 bar. - In a prismatic body made of transparent methacrylate with metal industrial parts on the inside. - On a base plate with four NW4 plugs self-sealing 1/8". <p>Pressure relief valve, direct control : Qty - 1 No.</p> <ul style="list-style-type: none"> - Pressure relief valve (ball), direct control. - Manual adjustment using the twist handle. - Pmax: 10 bar. - In a prismatic body made of transparent methacrylate with metal industrial parts on the inside. - On a base plate with two NW4 plugs self-sealing 1/8". <p>One way restrictor : Qty - 1 No.</p> <ul style="list-style-type: none"> - Pmax: 10 bar. - It enables the oil to flow on one direction only. - In a prismatic body made of transparent methacrylate with metal industrial parts on the inside. - On a base plate with three NW4 plugs self-sealing 1/8". <p>Two way flow control valve : Qty - 1 No.</p>	
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<ul style="list-style-type: none"> - Two-way flow control valve, with two ports, needle. - Manual adjustment by rotary knob. - Pmax: 10 bar. - It enables the oil flow in both direction to be adjusted. - In a prismatic body made of transparent methacrylate with metal industrial parts on the inside. - On a base plate with two NW4 plugs self-sealing 1/8". <p>Set of 10 hoses : Qty - 1 Set.</p> <ul style="list-style-type: none"> - Set of 10 transparent polyurethane tubes. - Pmax: 10 bar. - 520 mm length: 6 units - 350 mm length: 4 units - With two NW4 socket 1/8". <p>6 connection distributor on manifold : Qty - 1 No.</p> <ul style="list-style-type: none"> - Pmax: 10 bar. - In a prismatic body made of transparent methacrylate. - On a base plate with six NW4 plugs self-sealing 1/8". <p>Cross distributor with pressure gauge : Qty - 1 No.</p> <ul style="list-style-type: none"> - Distributor with 3 connections with 2-self sealing plugs and 1 socket. - Pressure gauge from 0 to 16 bar. - In a prismatic body made of transparent methacrylate. - On a base plate with two self-sealing NW4 plugs and 1 NW4 socket 1/8". <p>User's and exercise manual. English.</p> <ul style="list-style-type: none"> - It will include dossiers with hydraulics - electrohydraulic activities proposed and solutions <p>TRANSPARENT HYDRAULICS COMPOSITION – LEVEL II : Qty - 1 No.</p> <p>General features:</p> <ul style="list-style-type: none"> - All the hydraulic components will use anti-leakage quick NW4 plugs self-sealing 1/8". - All the components that should have, will be mounted on a base plate. - Each of these components will include a fixing system to the assembly panel, with a specific design based on POM material (state-of-the-art polymer with self-lubricating properties, resistant to deformation, wear and ageing). - All of the components will be formed by a prismatic body made of transparent methacrylate with metal industrial parts on the inside. <p>COMPRISING THE FOLLOWING COMPONENTS AND QUANTITIES:</p> <p>Single acting cylinder : Qty - 1 No.</p> <ul style="list-style-type: none"> - Single acting cylinder D20/D10 x 40mm of stroke. Spring return. - Pmax: 10 bar. - In a prismatic body made of transparent methacrylate with metal industrial parts on the inside. - On a base plate with one NW4 plug self-sealing 1/8". <p>3 way pressure relief valve with damping : Qty - 1 No.</p> <ul style="list-style-type: none"> - Spool-type pressure relief valve, direct control. - Manual adjustment by rotary knob. - Pmax: 10 bar. - Opens the oil flow when the pre-set Pr. Value is reached at the input. - In a prismatic body made of transparent methacrylate with metal industrial parts on the inside. - On a base plate with three NW4 plugs self-sealing 1/8". <p>Pressure reducing valve, 3 way. Direct control : Qty - 1 No.</p> <ul style="list-style-type: none"> - Manual adjustment by rotary knob. - Pmax: 10 bar. - It enables the pr. Value at the output, at A to be adjusted.
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	<ul style="list-style-type: none"> - In a prismatic body made of transparent methacrylate with metal industrial parts on the inside. - On a base plate with three NW4 plugs self-sealing 1/8". <p>Manual shut-off valve, 2 way : Qty - 1 No.</p> <ul style="list-style-type: none"> - 2-port shut-off valve. - Manual rotary actuation. - Pmax: 10 bar. - Open/close the oil flow with an activation lever. - In a prismatic body made of transparent methacrylate with metal industrial parts on the inside. - On a base plate with two NW4 plugs self-sealing 1/8". <p>Piloted check valve : Qty - 1 No.</p> <ul style="list-style-type: none"> - Pmax: 10 bar. - Normally it allows the oil to pass in one direction only, but it does it in both directions when there is pressure in the pilot connection. - In a prismatic body made of transparent methacrylate with metal industrial parts on the inside. - On a base plate with three NW4 plugs self-sealing 1/8". <p>One way flow control valve : Qty - 1 No.</p> <ul style="list-style-type: none"> - Flow control valve with non-return, one-way. - Manual adjustment by rotary knob. - Pmax: 10 bar. - It enables the oil flow in one direction to be adjusted and flow to be unrestricted in the opposite direction. - In a prismatic body made of transparent methacrylate with metal industrial parts on the inside. - On a base plate with two NW4 plugs self-sealing 1/8". <p>Flow control valve with Pr. compensation : Qty - 1 No.</p> <ul style="list-style-type: none"> - Flow control valve with hydrostatic compensation. - Manual regulation by rotary knob. - Pmax: 10 bar. - It enables the flow to be adjusted regardless of the pressure values at the input and output. - In a prismatic body made of transparent methacrylate with metal industrial parts on the inside. - On a base plate with two NW4 plugs self-sealing 1/8". <p>Set of 5 hoses : Qty - 1 Set.</p> <ul style="list-style-type: none"> - Set of 5 transparent polyurethane tubes. - Pmax: 10 bar. - 520 mm length. - With two NW4 socket 1/8". <p>4 connection divider : Qty - 1 No.</p> <ul style="list-style-type: none"> - Pmax: 10 bar. - In a prismatic body made of transparent methacrylate. - On a base plate with three self-sealing NW4 plugs and 1 NW4 socket 1/8". <p>User's and exercise manual. English : Qty - 1 No.</p> <ul style="list-style-type: none"> - It will include dossiers with hydraulics - electrohydraulics activities proposed and solutions. <p>TRANSPARENT ELECTROHYDRAULICS COMPOSITION : Qty - 1 No.</p> <p>General features:</p> <ul style="list-style-type: none"> - All the hydraulic components will use anti-leakage quick NW4 plugs self-sealing 1/8". - All the electrical connectors will include 4 mm security terminals. - All the components that should have, will be mounted on a base plate. - Each of these components will include a fixing system to the assembly panel, with a specific design based on POM material (state-of-the-art polymer with self-lubricating properties,
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	<p>resistant to deformation, wear and ageing).</p> <ul style="list-style-type: none"> - All of the components will be formed by a prismatic body made of transparent methacrylate with metal industrial parts on the inside. <p><u>COMPRISING THE FOLLOWING COMPONENTS AND QUANTITIES:</u></p> <p>4/2 Solenoid valve, spring return : Qty - 1 No.</p> <ul style="list-style-type: none"> - Coil-operated with low consumption of 24Vcc 12w and spring return. - Pmax: 10 bar. - In a prismatic body made of transparent methacrylate with metal industrial parts on the inside. - On a base plate with four NW4 plugs self-sealing 1/8". <p>4/3 Solenoid valve with closed mid-position : Qty - 1 No.</p> <ul style="list-style-type: none"> - Coil-operated with low consumption of 24Vcc 12w on both sides and spring centered. - Pmax: 10 bar. - In a prismatic body made of transparent methacrylate with metal industrial parts on the inside. - On a base plate with four NW4 plugs self-sealing 1/8". <p>Power supply : Qty - 1 No.</p> <ul style="list-style-type: none"> - Input: 110 - 240 VAC - Output: 24 VDC/5A. - Protection against short circuit and overload. Input switch and LED display. - Supply cable included. - 4 mm female electrical safety connectors. - Insulating box with screen printed lid <p>Set of push-buttons : Qty - 1 No.</p> <ul style="list-style-type: none"> - 2 Push buttons: 1 green, 1 red, with 2 open contacts +2 closed contacts - 1 Selector with 2 open contacts + 2 closed contacts. - 4 mm female electrical safety connectors. - Insulating box with screen printed lid <p>Set of three relays : Qty - 1 No.</p> <ul style="list-style-type: none"> - 3 relays with 24VDC coil and 4 switchable contacts. - Relay-active LED. - 4 mm terminals for snap connection cables. - Insulating box with screen printed lid <p>Electric end of stroke (right) : Qty - 1 No.</p> <ul style="list-style-type: none"> - 1 contact NC and 1 contact NO. - 4 mm female safety connectors. - Transparent body and roller with reversible position. - Mounted on base plate and fixing system to the assembly panel. <p>Electrical end of stroke (left) : Qty - 1 No.</p> <ul style="list-style-type: none"> - 1 contact NC and 1 contact NO. - With cables and 4 mm security terminals. - Mounted on base plate and fixing system to the assembly panel. <p>Set of connectors for solenoids. 2 grey + 1 black : Qty - 1 No.</p> <ul style="list-style-type: none"> - Connector (2 grey and 1 black colour) + LED + cable 1.5m + 4 mm terminals (1 red and 1 blue colour). - Ready to connect in solenoid valve coils. <p>Set of electrical connectors : Qty - 1 No.</p> <ul style="list-style-type: none"> - Comprising 25 cables of different colours with 4 mm electrical connectors. - 5 Red cable – length: 1.5m - 5 Black cable – length: 1m - 10 Yellow cable – length: 0.5m - 5 Blue cable – length: 0.25m <p>User's and exercise manual. English. : Qty - 1 No.</p>
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	- It will include dossiers with hydraulics - electrohydraulic activities proposed and solutions.
8.	<p><u>SENSOR TRAINING KIT (it should not be add on kit, it should be a separate kit) : Qty - 1 No</u></p> <p>Compact and user friendly trainer to provide a modern, portable, comprehensive and practical way to learn Technology of sensors. Trainer should be provided with detailed learning material which covers objectives, step by step procedure to conduct the experiment and other useful information on Fiber optic, inductive, capacitive, optical and magnetic sensors.</p> <p>Equipment should be supplied with:</p> <p>Equipment user manual. Theoretical-practical activities proposal for the student. Solutions to the proposed activities for the instructor.</p> <p>Integral parts:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Working table: mechanical part and electrical modules. It includes: <input type="checkbox"/> Linear guide with spindle and wheel. <input type="checkbox"/> Graduated support for sensors. <input type="checkbox"/> Materials for detection and positioning. <input type="checkbox"/> Power supply: 24 VDC. <input type="checkbox"/> Emergency push button. <input type="checkbox"/> On/off switch. <input type="checkbox"/> LED indicators for detection of sensor activation. <input type="checkbox"/> Buzzer for audio indication of sensor activation. <input type="checkbox"/> Auxiliary relay. <p>Sensor trainer kit should be capable of helpful in study following practical activities:</p> <p><u>PRACTICAL ACTIVITIES</u></p> <p>P1: Characteristics of the inductive switch</p> <ul style="list-style-type: none"> . To analyse the characteristics of the inductive switch. . To describe the concepts: connection point, disconnection point and hysteresis of a proximity switch. . To identify the influence of the diameter of the sensor on the switching distance. <p>Description of the element required to complete activity.</p> <ul style="list-style-type: none"> - Omron M12 inductive switch - Omron M18 inductive switch - Switch mount. - Test piece - Connecting plate 1: Power supply source & displays - <p>P2: Use of the inductive switch to detect different materials</p> <p>To determine the influence that the material of the part which is to be detected has on the switching distance.</p> <p>Description of the element required to complete activity.</p> <ul style="list-style-type: none"> - M18 inductive switch - Piece of mild steel - Piece of stainless steel - piece of aluminium - Piece of brass - Switch mount - Connecting plate 1: Power supply source & displays. <p>P3: Influence of the object's dimensions on the inductive switch</p> <ul style="list-style-type: none"> . To determine the influence that the dimensions of the object which is to be detected have on

	<p>the switching distance.</p> <p>Description of the element required to complete activity.</p> <ul style="list-style-type: none"> - Omron M18 inductive switch - 3 Pieces of stainless steel of different size - Switch mount - Connecting plate 1: Power supply source & displays- <p>P4: Characteristics of capacitive switches</p> <ul style="list-style-type: none"> · To analyse the switching characteristics of a capacitive proximity switch. <p>Description of the element required to complete activity.</p> <ul style="list-style-type: none"> - Omron M18 capacitive switch - Piece of Cardboard - Piece of Methacrylate - Piece of Mild steel - Switch mount - Connecting plate 1: Power supply source & displays <p>P5: Use of the capacitive switch to detect different thicknesses</p> <ul style="list-style-type: none"> · To identify the influence that the thickness of the object which is to be detected has on the switching distance of a capacitive proximity switch. · To detect plastic objects with a capacitive proximity switch. <p>Description of the element required to complete activity.</p> <ul style="list-style-type: none"> - Omron M18 capacitive switch - Piece of Cardboard - Piece of Methacrylate - Piece of Mild steel - Switch mount - Connecting plate 1: Power supply source & displays <p>P6: Lateral approach with capacitive proximity switches</p> <ul style="list-style-type: none"> · To analyse and plot the switching characteristics of a capacitive proximity switch with a lateral approach. <p>Description of the element required to complete activity.</p> <ul style="list-style-type: none"> - Omron M18 capacitive switch - Test object Mild steel - Switch mount - Connecting plate 1: Power supply source & displays <p>P7: Object reflex photo electric switch</p> <ul style="list-style-type: none"> · To identify desirable and undesirable objects using a direct reflection sensor. · To analyse the technical and switching features of a direct reflection sensor. <p>Description of the element required to complete activity.</p> <ul style="list-style-type: none"> - Omron M18 Photo electric switch Reflex on object. - Piece of Stainless steel - Piece of Aluminium - Piece of Methacrylate - Piece of Black plastic - Switch mount. - Connecting plate 1: Power supply source & displays. <p>P8: Retroreflective photo electric switch</p>
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	<ul style="list-style-type: none"> · To analyse the features of a retroreflective switch. · To assemble the switch and the reflector correctly. <p>Description of the element required to complete activity.</p> <ul style="list-style-type: none"> - Omron M18 Photo electric switch Reflex on object. - Piece of Red plastic - Piece of Brass - Piece of Methacrylate - Piece of Aluminium - Switch mount - Connecting plate 1: Power supply source & displays <p>P9: Fibre optic object reflex sensor</p> <ul style="list-style-type: none"> · To identify the changes in the detection distance according to the sensitivity to which the sensor is adjusted. · To determine the characteristics of a photo electric reflex object sensor with fibre optics. <p>Description of the element required to complete activity.</p> <ul style="list-style-type: none"> - Omron Photo electric sensor with digital adjustment - Object reflex fibre optic cable - Piece of black plastic - Switch mount - Connecting plate 1: Power supply source & displays <p>P10: Using fibre optic to detect different colours</p> <ul style="list-style-type: none"> • To determine the characteristics of an object reflex sensor with fibre optic cables according to the materials to be detected. • To detect objects of different colours by playing with the sensitivity. • To assemble a sensor with fibre optic cables. <p>Description of the element required to complete activity.</p> <ul style="list-style-type: none"> - Photo electric sensor with digital adjustment - Object reflex fibre optic cable - Piece of black plastic - Piece of red plastic - Switch mount - Connecting plate 1: Power supply source & displays <p>P11: Use of a fibre optic barrier sensor</p> <ul style="list-style-type: none"> · To determine the characteristics of a photo electric barrier sensor with fibre optic cables. · To detect a transparent object with an optical barrier sensor with fibre optic. <p>Description of the element required to complete activity.</p> <ul style="list-style-type: none"> - Photo electric sensor with digital adjustment - Fibre optic transmitter cable - Fibre optic receiver cable - Piece of methacrylate - Switch mount - Connecting plate 1: Power supply source & displays <p>P12: Magnetic proximity switches</p>
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	<ul style="list-style-type: none"> · To identify the characteristics of a reed-type magnetic proximity switch according to the position and alignment of the magnet. <p>Description of the element required to complete activity.</p> <ul style="list-style-type: none"> - Magnetic switch - Test pieces with permanent magnets - Switch mount - Connecting plate 1: Power supply source & displays
9.	<p><u>Necessary Softwares : Qty - 1 No.</u></p> <p>Basic Pneumatics Training Software with animation covering below mentioned study material.</p> <ul style="list-style-type: none"> · Properties of compressed air and its area of application. · Basic pneumatic system and compressed air theory. · Description of different types of pneumatic compressor <p>Compressed air production, purification and distribution.</p> <ul style="list-style-type: none"> · Explanation of different air filtering, regulation, and lubrication techniques. · Construction, principle of operation, sizing and mounting of actuators and Directional Control Valves. · Familiarization with pneumatic symbols-ISO 1219/5599. · Ancillary pneumatic equipment · Reading/designing of control schematics · Practical exercises with troubleshooting <p>Basic Electro - Pneumatics Training Software with animation covering below mentioned study material.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Basic Electric Theory. <input type="checkbox"/> Construction and principle of operation of basic electrical components <input type="checkbox"/> Theory of Electromagnetism <input type="checkbox"/> Construction and principle of operation of Electro Pneumatic Components. <input type="checkbox"/> Construction and principle of operation of electrical logic components <input type="checkbox"/> Symbols – ISO 1219/5599. <input type="checkbox"/> Construction of Ladder diagram. <input type="checkbox"/> Reading/Design of control Schematics. <input type="checkbox"/> EP1 Practical exercises with troubleshooting.
10.	<p><u>Set of Training cut sections – consisting of Qty 1 each</u></p> <p>Cut section (dissection view) of various pneumatics product as below for study purpose to understand the working & construction of the product in a more refined way:</p> <ul style="list-style-type: none"> - Cut section for air filter - Cut section for air regulator - Cut section for air filter regulator - Cut section for double acting air cylinder - Cut section for single acting air cylinder - Cut section for solenoid valve - Cut section for rotary actuator
11.	<p><u>Pneumatic magnetic board symbols for training purpose – QTY 02 each</u></p> <p>Magnetic symbols of various pneumatics product for study purpose to understand the circuit designing in pneumatic system.</p>

12.	<p>Poster set (set of 10 posters) on pneumatic products which should include:</p> <ul style="list-style-type: none"> - Heavy duty auto drain - Single acting cylinder - Rack and pinion type rotary actuator - Membrane Air dryer - Air Gripper - Rodless cylinder - Solenoid valve - Vacuum pad - Check valve and shuttle valve - Air filter regulator
13.	<p>NECESSARY TRAINING TEXT BOOKS-QTY 5 Nos</p> <p>Basic & Advanced pneumatics, Covering following:</p> <ul style="list-style-type: none"> - Introduction of Pneumatics - Basic Pneumatic system - Compressed air theory - Details on Air compression, preparation and distribution - Air treatment - Piping - Air line equipment - Directional control valves - Actuators - Symbols <p>Basic Pneumatic Circuits</p> <ul style="list-style-type: none"> - Servicing and safety notes <p>Basic & Advanced Electro Pneumatics Basic Electric theory</p> <ul style="list-style-type: none"> - Electro pneumatic Components - Sensors timers and counters - Compressed air basics - Control Systems - Various Control Circuits - Introduction to sequence control - Sequence control with opposing Signal - Sequence control with supplementary conditions - Circuit design for industrial applications - Electrical Safety <p>PLC, Covering following</p> <ul style="list-style-type: none"> - Introduction of PLC - PLC Hardware components - Types of PLCs - Number, codes and little logic - Concept of PLC programming - Basic Programming instructions - PLC specifications - Simple ladder logic diagrams - PLC program case studies - PLC installation commissioning and trouble shooting <p>Vacuum, Covering following</p> <ul style="list-style-type: none"> - Industrial vacuum technology - Units of measure - Vacuum generation

	<ul style="list-style-type: none"> - Vacuum Systems - Glossary of low and high vacuum terms - Vacuum pad selection - Vacuum ejector selection - Vacuum pump Systems - Peripheral vacuum components
14.	E-Learning License for 1 User for 1Year
15.	AUTOSIM-200 Educational License for 1User for1 Year
16.	Booklets on Problems of industrial circuit design with solutions on Pneumatics & Electropneumatics-Qty-5

General Terms and Conditions:

- Proposals must be received well within given time frame in, Sant Longowal Institute of Engineering and technology, Longowal-148106, Punjab, India.
- In order to be considered for the award, all packages must be received at the appropriate location by the required time. Any package not received on time at the noted location may be rejected.
- Vendor(s) shall include a complete description of all products and services offered in their Proposal.
- All products shall be new and of first quality.
- All Vendors must provide any/all warranty information whether it is expressed or implied for specific products at the time of delivery.
- Training: Comprehensive ordering system training programs and packages shall be provided at no additional cost to the institute by the Vendor and made available as needed to ensure that all the nominated institute personnel are properly trained.
- All products shall be shipped FOB Destination, at the awarded Vendor's expense. All items shall be at the Vendor's risk until they have been delivered and accepted by the receiving entity. All items shall be subject to inspection on delivery. Hidden damage will remain the responsibility of the Prospective Bidder to remedy without cost to the University; regardless of when the hidden damage is discovered.
- Prospective Bidders are responsible for filing and expediting all freight claims with the carrier.
- Delivery costs are the responsibility of the awarded vendor.
- If special delivery or handling charges are applicable, they shall be pre-approved by the order initiator.
- The vendor will arrange for the return of all erroneously ordered or shipped items at no cost to the institute. There will be no restocking fee for return of items that are damaged or shipped by the vendor in error.
- The institute reserves the right to terminate the awarded vendor's services for cause at any time during the term of the contract.
- The awarded vendor may not assign, sell or sub-contract its obligations under the contract to any third party without prior written approval of the institute.
- In the event that the contract is terminated either by contract expiration or by voluntary termination by the institute, the vendor must continue all services until new services become completely operational.
- All equipments must be delivered, installed and commissioned within a maximum period of 45 days from the date of placement of order.

SECTION VI-A : QUALIFICATION CRITERIA
(Referred to in Clause 13.3 (b) of ITB)

Sr. No	Questions
1	(a) The legal status (b) Place of registration (c) Principal place of business of the company or firm or partnership and (d) Must have been in business at least for the last 5 years (Attach attested copies of appropriate documents)
2	TIN, GST Number and PAN. (Provide Income Tax return for the last 2 Years)
3	Provide details of similar / relevant activities for at least last 3 years. Must have carried out minimum two sets of installations and successful commissioning of similar facilities in R&D / academic institutes of higher learning globally (preferably one installation in India) (Provide PO and installation certificate)
4	Minimum turnover of 50 crores per year for the last 3 consecutive years. (Attested copies of financial statement shall be submitted with the bid)
5	Must be an OEM and must have experience for Automation support of large global companies like Maruti-Suzuki, Fanuc, Mitsubishi, Fujitsu, GE, ABB, Panasonic or any other reputed company. (Provide necessary certificate)
6	Must possess Intellectual Property Rights or shall be authorized for software learning material, digital Content etc. wherever applicable. (Provide necessary document)
7	Must have handholding team and trained Master trainers. (Provide necessary document)
8	Must be capable of undertaking installations of all the labs as a turnkey project, partial offer for selective labs will not be accepted.
9	The bill of materials contained in the bid should be equivalent or at par with components used by global companies mentioned above.

The bids shall be processed in three parts:

Part A	Fulfilment of qualification criteria by the bidders as stipulated above.
Part B	The committee constituted by SLIET shall evaluate the detailed project report submitted by the bidders. The prospective authorized bidders may be invited to make presentation before the committee.
Part C	The bidders who are declared eligible shall be entitled for opening of their financial bid(s). The lowest bidder's bid shall be awarded the project

SECTION VII: BID FORM AND PRICE SCHEDULE

SECTION VII: BID FORM

Date :.....

Credit/Loan No :.....

IFB No :.....

TO: (Name and address of purchaser)

Gentlemen and/or Ladies :

Having examined the Bidding Documents including Addenda Nos..... *[insert numbers]*, the receipt of which is hereby duly acknowledged, we, the undersigned, offer to supply and deliver..... *(Description of Goods and Services)* in conformity with the said bidding documents for the sum of *(Total bid amount in words and figures)* or such other sums as may be ascertained in accordance with the Schedule of Prices attached herewith and made part of this bid.

We undertake, if our bid is accepted, to deliver the goods in accordance with the delivery schedule specified in the Schedule of Requirements.

If our bid is accepted, we will obtain the guarantee of a bank in a sum equivalent to percent of the Contract Price for the due performance of the Contract, in the form prescribed by the Purchaser.

We agree to abide by this bid for the Bid validity period specified in Clause 16.1 of the Bid Data Sheet and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

Commissions or gratuities, if any, paid or to be paid by us to agents relating to this Bid, and to contract execution if we are awarded the contract, are listed below :

Amount Rupees

Name and address of agent

Purpose of Commission or gratuity

(if none, state "none").

Until a formal contract is prepared and executed, this bid, together with your written acceptance thereof and your notification of award, shall constitute a binding Contract between us.

We undertake that, in competing for (and, if the award is made to us, in executing) the above contract, we will strictly observe the laws against fraud and corruption in force in India namely "Prevention of Corruption Act 1988".

We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in bribery.

We understand that you are not bound to accept the lowest or any bid you may receive.

We clarify/confirm that we comply with the eligibility requirements as per ITB Clause 2 of the bidding documents.

Dated this day of 19

(signature)

(in the capacity of)

Duly authorized to sign Bid for and on behalf of

PRICE SCHEDULE

SECTION VIII: BID SECURITY FORM

SECTION VIII: BID SECURITY FORM

Whereas¹ (*hereinafter called "the Bidder"*) has submitted its bid dated (*date of submission of bid*) for the supply of (*name and/or description of the goods*) (*hereinafter called "the Bid"*).

KNOW ALL PEOPLE by these presents that WE (*name of bank*) of (*name of country*), having our registered office at (*address of bank*) (*hereinafter called "the Bank"*), are bound unto (*name of Purchaser*) (*hereinafter called "the Purchaser"*) in the sum of _____ for which payment well and truly to be made to the said Purchaser, the Bank binds itself, its successors, and assigns by these presents. Sealed with the Common Seal of the said Bank this ____ day of _____ 20__.

THE CONDITIONS of this obligation are:

1. If the Bidder
 - (a) withdraws its Bid during the period of bid validity specified by the Bidder on the Bid Form; or
 - (b) does not accept the correction of errors in accordance with the ITB; or
2. If the Bidder, having been notified of the acceptance of its bid by the Purchaser during the period of bid validity:
 - (a) fails or refuses to execute the Contract Form if required; or
 - (b) fails or refuses to furnish the performance security, in accordance with the Instruction to Bidders; we undertake to pay the Purchaser up to the above amount upon receipt of its first written demand, without the Purchaser having to substantiate its demand, provided that in its demand the Purchaser will note that the amount claimed by it is due to it, owing to the occurrence of one or both of the two conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to and including forty five (45) days after the period of the bid validity, and any demand in respect thereof should reach the Bank not later than the above date.

.....
(Signature of the Bank)

_____ ¹ *Name of Bidder*

SECTION IX: CONTRACT FORM

SECTION IX: CONTRACT FORM

THIS AGREEMENT made theday of....., 20... Between (*Name of purchaser*) of (*Country of Purchaser*) (hereinafter called "the Purchaser") of the one part and (*Name of Supplier*) of (*City and Country of Supplier*) (hereinafter called "the Supplier") of the other part :

WHEREAS the Purchaser is desirous that certain Goods and ancillary services viz., (*Brief Description of Goods and Services*) and has accepted a bid by the Supplier for the supply of those goods and services in the sum of (*Contract Price in Words and Figures*) (hereinafter called "the Contract Price").

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz.:
 - (a) the Bid Form and the Price Schedule submitted by the Bidder;
 - (b) the Schedule of Requirements;
 - (c) the Technical Specifications;
 - (d) the General Conditions of Contract;
 - (e) the Special Conditions of Contract; and
 - (f) the Purchaser's Notification of Award.
3. In consideration of the payments to be made by the Purchaser to the Supplier as hereinafter mentioned, the Supplier hereby covenants with the Purchaser to provide the goods and services and to remedy defects therein in conformity in all respects with the provisions of the Contract.
4. The Purchaser hereby covenants to pay the Supplier in consideration of the provision of the goods and services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

Brief particulars of the goods and services which shall be supplied/provided by the Supplier are as under:

SL. NO.	BRIEF DESCRIPTION OF GOODS & SERVICES	QUANTITY TO UNIT BE SUPPLIED	Total PRICE	DELIVERY TERMS
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TOTAL VALUE:

DELIVERY SCHEDULE:

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with their respective laws the day and year first above written.

Signed, Sealed and Delivered by the

said (For the Purchaser)

in the presence of:.....

said (For the Supplier)

in the presence of:.....

SECTION X: PERFORMANCE SECURITY FORM

SECTION X: PERFORMANCE SECURITY FORM

To:

.....(Name of Purchaser)

WHEREAS(Name of Supplier)

hereinafter called "the Supplier" has undertaken , in pursuance of Contract (Notification of Award)

No..... dated,..... 20... to supply.....(Description of Goods and Services) hereinafter called "the Contract".

AND WHEREAS it has been stipulated by you in the said Contract that the Supplier shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with the Supplier's performance obligations in accordance with the Contract.

AND WHEREAS we have agreed to give the Supplier a Guarantee:

THEREFORE WE hereby affirm that we are Guarantors and responsible to you, on behalf of the Supplier, up to a total of (Amount of the Guarantee in Words and Figures) and we undertake to pay you, upon your first written demand declaring the Supplier to be in default under the Contract and without cavil or argument, any sum or sums within the limit of (Amount of Guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This guarantee is valid until theday of.....20.....

Signature and Seal of Guarantors

.....

Date.....20....

Address:.....

SECTION XI: PERFORMANCE STATEMENT

Please attach “Proforma for Performance Statement”

SECTION XII

(Please see Clause 13.3(a) of Instructions to Bidders)

MANUFACTURERS' AUTHORIZATION FORM*

No. dated

To

Dear Sir:

IFB No.

We_____ who are established and reputable manufacturers of
(*name and description of goods offered*) having factories at (*address of factory*) do hereby authorize M/s
_____(*Name and address of Agent*) to submit a bid, and sign the contract with you for the goods
manufactured by us against the above IFB.

No company or firm or individual other than M/s are authorized to bid, and conclude the contract for the
above goods manufactured by us, against this specific IFB. (*This para should be deleted in simple items
where manufacturers sell the product through different Stockiests.*)

We hereby extend our full guarantee and warranty as per Clause 15 of the General Conditions of Contract
and Clause 10 of the Special Conditions of Contract for the goods and services offered for supply by the
above firm against this IFB.

Yours faithfully

(Name)

(Name of manufacturers)

Note:

This letter of authority should be on the letterhead of the manufacturer and should be signed by a
person competent and having the power of attorney to legally bind the manufacturer. It should be
included by the Bidder in its bid.

* Modify this format suitably in case where manufacturer's warranty and guarantee are not applicable
for the items for which bids are invited.

SECTION XIII

SAMPLE FORM

BANK GUARANTEE FOR ADVANCE PAYMENT

To. _____ (*name of Purchaser*)
_____ (*address of Purchaser*)
_____ (*name of Contract*)

Gentlemen:

In accordance with the provisions of the Special Conditions of Contract which amends Clause 16 of the General Conditions of Contract (*name and address of Supplier*) (hereinafter called "the supplier") shall deposit with (*name of Purchaser*) a bank guarantee to guarantee his proper and faithful performance under the said Clause of the Contract in an amount of (*amount of guarantee*)* (*in words*).

We, the (*bank or financial institution*), as instructed by the Supplier, agree unconditionally and irrevocably guarantee as primary obligator and not as Surety merely, the payment to (*name of Purchaser*) on his first demand without whatsoever right of objection on our part and without his first claim to the Supplier, in the amount not exceeding (*amount of guarantee*)* (*in words*).

We further agree that no change or addition to or other modification of the terms of the Contract to be performed thereunder or of any of the Contract documents which may be made between (*name of Purchaser*) and the Supplier, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall remain valid and in full effect from the date of the advance payment received by the Supplier under the contract until _____

Yours truly,

Signature and seal :

Name of bank :

financial institution :

Address :

Date :

* An amount is to be inserted by the bank representing the amount of the Advance Payment.

SECTION XIV

Eligibility for the Provision of Goods, Works and Services in Bank-Financed Procurement.

As of March 2000¹

For the information of Borrowers and Bidders, and with reference to paragraph 1.6, footnote 9, of the *Guidelines: Procurement under IBRD Loans and IDA Credits*, dated January 1995 (revised January and August 1996 and September 1997, and January 1999), set forth below is a list of countries from which Bidders, Goods and Services are not eligible to participate in procurement financed by the World Bank or IDA².

- Andorra
- Cuba
- Democratic People's Republic of Korea (North Korea)
- Liechtenstein
- Monaco
- Nauru
- Tuvalu

In addition, Bidders, Goods and Services from other countries or territories may be declared ineligible by a provision in the Bidding. Documents if the borrower's country has excluded them by a law, an official regulation, or an act of compliance meeting the requirements of paragraph 1.8 (a) of the *Guidelines: Procurement under IBRD Loans and IDA Credits*.

The Loan/Credit Agreement also prohibits a withdrawal from the Loan / Credit Account for the purpose of any payment to persons or entities, or for any import of goods, if such payment or import, to the knowledge of the Bank, is prohibited by a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations. At the present time, this prohibition applies to no country.

Notes:

1. The most current listing of eligible countries can be viewed on the Public Information Center's Web page at: <http://www.worldbank.org/html/pic/PROCURE.html>. A list of firms debarred from participating in World Bank projects is available at: [HYPERLINK](#)

"<http://www.worldbank.org/html/pic/PROCURE.html>" <http://www.worldbank.org/html/opr/procure/debarr.html>.

2. Any questions regarding this list should be addressed to the Senior Manager, Procurement Policy and Services Group, Operational Core Services Network, The World Bank

ANNEXURE XV

PROFORMA FOR EQUIPMENT AND QUALITY CONTROL EMPLOYED BY THE MANUFACTURER

BID NO.

DATE OF OPENING:.....

NAME OF THE BIDDER :

(Note : All details should relate to the manufacturer for the items offered for supply)

1. Name & full address of the Manufacturer
2. (a) Telephone & Fax No Office/Factory/Works
(b) Telex No. Office/Factory/Works
(c) Telegraphic address :
3. Location of the manufacturing factory.
4. Details of Industrial License, wherever required as per statutory regulations.
5. Details of important Plant & Machinery functioning in each dept. (Monographs & description pamphlets be supplied if available).
6. Details of the process of manufacture in the factory.
7. Details & stocks of raw materials held.
8. Production capacity of item(s) quoted for, with the existing Plant & Machinery
 - 8.1 Normal
 - 8.2 Maximum
9. Details of arrangement for quality control of products such as laboratory, testing equipment etc.
10. Details of staff:
 - 10.1 Details of technical supervisory staff in charge of production & quality control.
 - 10.2 Skilled labour employed.
 - 10.3 Unskilled labour employed.
 - 10.4 Maximum No. of workers (skilled & unskilled) employed on any day during the 18 months preceding the date of Tender.
11. Whether Goods are tested to any standard specification? If so, copies of original test certificates should be submitted in triplicate.
12. Are you registered with the Directorate General of Supplies and Disposals, New Delhi 110 001, India? If so, furnish full particulars of registration, period of currency etc. with a copy of the certificate of registration.

.....

Signature and seal of the Manufacturer

- [1] In this context, any action taken by a bidder, supplier, contractor, or any of its personnel, agents, subcontractors, sub-consultants, service providers, suppliers and/or their employees to influence the procurement process or contract execution for undue advantage is improper.
- [2] “Another party” refers to a public official acting in relation to the procurement process or contract execution. In this context, “public official” includes World Bank staff and employees of other organizations taking or reviewing procurement decisions.
- [3] “Party” refers to a public official; the terms “benefit” and “obligation” relate to the procurement process or contract execution; and the “act or omission” is intended to influence the procurement process or contract execution.
- [4] “Parties” refers to participants in the procurement process (including public officials) attempting to establish bid prices at artificial, non- competitive levels.
- [5] “Party” refers to a participant in the procurement process or contract execution.
- [6] A firm or an individual may be declared ineligible to be awarded a Bank-financed contract upon completion of the Bank’s sanctions proceedings as per its sanctions procedures, including inter alia: (i) temporary suspension in connection with an ongoing sanctions proceeding; (ii) cross-debarment as agreed with other International Financial Institutions, including Multilateral Development Banks; and (iii) the World Bank Group corporate administrative procurement sanctions procedures for fraud and corruption.
- [7] A nominated sub-contractor, consultant, manufacturer or supplier, or service provider (different names are used depending on the particular bidding document) is one which either has been: (i) included by the bidder in its pre-qualification application or bid because it brings specific and critical experience and know-how that are accounted for in the evaluation of the bidder’s pre-qualification application or the bid; or (ii) appointed by the Borrower.
- [8] In this context, any action taken by a bidder, supplier, contractor, or any of its personnel, agents, subcontractors, sub-consultants, service providers, suppliers and/or their employees to influence the procurement process or contract execution for undue advantage is improper.
- [9] “Another party” refers to a public official acting in relation to the procurement process or contract execution. In this context, “public official” includes World Bank staff and employees of other organizations taking or reviewing procurement decisions.
- [10] “Party” refers to a public official; the terms “benefit” and “obligation” relate to the procurement process or contract execution; and the “act or omission” is intended to influence the procurement process or contract execution.
- [11] “Parties” refers to participants in the procurement process (including public officials) attempting to establish bid prices at artificial, non- competitive levels.
- [12] “Party” refers to a participant in the procurement process or contract execution.
- [13] A firm or an individual may be declared ineligible to be awarded a Bank-financed contract upon completion of the Bank’s sanctions proceedings as per its sanctions procedures, including inter alia: (i) temporary suspension in connection with an ongoing sanctions proceeding; (ii) cross-debarment as agreed with other International Financial Institutions, including Multilateral Development Banks; and (iii) the World Bank Group corporate administrative procurement sanctions procedures for fraud and corruption.
- [14] A nominated sub-contractor, consultant, manufacturer or supplier, or service provider (different names are used depending on the particular bidding document) is one which either has been: (i) included by the bidder in its pre-qualification application or bid because it brings specific and critical experience and know-how that are accounted for in the evaluation of the bidder’s pre-qualification application or the bid; or (ii) appointed by the Borrower.