

**University Institute of Engineering and Technology,  
Chandigarh**

**Sector 25, South Campus Panjab University Chandigarh  
TEQIP Cell contact No. 0172 2534995 Fax No. 0172 2547986**

**BID REFERENCE NO: TEQIP-II/CH/CH1G01/18**

**NATIONAL COMPETITIVE BIDDING**

**FOR**

**PROCUREMENT OF EQUIPMENT**

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

**(A WORLD BANK ASSISTED PROJECT)  
CREDIT NO. - CR. 4685-0 IN**

**NATIONAL COMPETITIVE BIDDING FOR**  
**THE SUPPLY OF Electric Trainer**

BID REFERENCE : **TEQIP-II/CH/CH1G01/18**

DATE OF COMMENCEMENT OF  
SALE OF BIDDING DOCUMENT : **DATE 06.08.2012 TIME: 09:00 Hrs**

LAST DATE FOR SALE OF  
BIDDING DOCUMENT : **DATE 07.09.2012 TIME: 11:00 Hrs**

LAST DATE AND TIME FOR  
RECEIPT OF BIDS : **DATE 07.09.2012  
TIME 11:00 Hrs**

TIME AND DATE OF OPENING  
OF BIDS : **DATE 07.09.2012  
TIME 11:30 Hrs**

PLACE OF OPENING OF BIDS : **UIET, Sector 25, South Campus, Panjab University,  
Chandigarh**

ADDRESS FOR COMMUNICATION : **UIET, Sector 25, South Campus, Panjab University,  
Chandigarh**

**SECTION I: INVITATION FOR BIDS (IFB)**

**NATIONAL COMPETITIVE BIDDING FOR**  
**THE SUPPLY OF Electric Trainer**

**SECTION I. INVITATION FOR BIDS (IFB)**

Date : 30.07.2012  
Credit No. : Cr. 4685-0 IN  
IFB No. : TEQIP-II/CH/CH1G01/18

1. The Government of India has received a Credit (Cr. 4685-0 IN) from the International Development Association in various currencies towards the cost of project\_Technical Education Quality Improvement Programme[TEQIP]-Phase II (TEQIP II) 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, University Institute of Engineering and Technology, Chandigarh** now invites sealed bids from eligible bidders for supply of **Electric Trainer** listed below:

<b><u>Sr.</u></b>	<b><u>Item Name</u></b>	<b><u>Quantity</u></b>
<b><u>1</u></b>	<b><u>Advance High performance Sensor experiment system</u></b>	<b><u>1</u></b>
<b><u>2</u></b>	<b><u>Advance PLC (Programmable Logic Control) with digital and Analog Input/ output, 9 nos. of modules</u></b>	<b><u>1</u></b>
<b><u>3</u></b>	<b><u>Brush Less DC Motor Traine</u></b>	<b><u>1</u></b>
<b><u>4</u></b>	<b><u>Control training system with Computer Interface</u></b>	<b><u>1</u></b>
<b><u>5</u></b>	<b><u>DSP 67xx development system with</u></b>	<b><u>2</u></b>
<b><u>6</u></b>	<b><u>Electrical Machine Trainer System</u></b>	<b><u>1</u></b>
<b><u>7</u></b>	<b><u>Power electronics trainer system with experimental panels</u></b>	<b><u>1</u></b>
<b><u>8</u></b>	<b><u>Power Engineering Trainer with Protection Relays-I</u></b>	<b><u>1</u></b>
<b><u>9</u></b>	<b><u>Power Engineering Trainer with Transmission Line</u></b>	<b><u>1</u></b>
<b><u>10</u></b>	<b><u>Process Control Trainer</u></b>	<b><u>1</u></b>

3. Interested eligible Bidders may obtain further information from and inspect the bidding documents at the office of the **Sector 25, South Campus Panjab University Chandigarh, 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 **The Director, UIET, payable at Chandigarh**.
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 **University Institute of Engineering and Technology, Chandigarh** during office hours namely, from **09:00 hrs to 17:00 hrs**, on all working days either in person or by post.
  - (a) Price of bidding document (non-refundable) : **500**
  - (b) Postal charges, inland : **100**
  - (c) Postal charges, overseas :
  - (d) Date of commencement of sale of bidding document : **Date 06.08.2012 TIME: 09:00 Hrs**

- (e) Last date for sale of bidding document : **Date 07.09.2012 TIME: 11:00 Hrs**
- (f) Last date and time for receipt of bids : **Date 07.09.2012  
Time 11:00 Hours**
- (g) Time and date of opening of bids : **Date 07.09.2012 Time  
11:30 Hours**
- (h) Place of opening of bids : **UIET, Sector 25, South Campus, Panjab University,  
Chandigarh**
- (i) Address for communication : **Sector 25, South Campus, Panjab University,  
Chandigarh**

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

### TABLE OF CLAUSES

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

## 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 II(TEQIP II)** 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: Procurement under IDA Credits*, May 2004, revised October 2006 hereinafter referred as the *IDA Guidelines for Procurement*, 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 *IDA Guidelines for Procurement* 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, University Institute of Engineering and Technology, Chandigarh**, hereinafter 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.

11.2 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, as applicable), including all duties and sales and other taxes already paid or payable:
  - a. on components and raw material used in the manufacture or assembly of goods quoted ex-works or ex-factory; or
  - b. on the previously imported goods of foreign origin quoted ex-showroom, ex-warehouse or off-the-shelf.
- (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
- (iv) 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.

*[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.]*

(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 proforma 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.

### **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.
- 15.3 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.
- 15.4 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.
- 15.5 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.
- 15.6 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 The bid security may be forfeited:
- (a) if a Bidder (i) withdraws its bid during the period of bid validity specified by the Bidder on the Bid Form; or (ii) does not accept the correction of errors pursuant to ITB Clause 24.2; or
  - (b) in case of a successful Bidder, if the Bidder fails:
    - (i) to sign the Contract in accordance with ITB Clause 34; or
    - (ii) to furnish performance security in accordance with ITB Clause 35.

## **16. Period of Validity of Bids**

- 16.1 Bids shall remain valid for 180 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 In exceptional circumstances, the Purchaser may solicit the Bidder's consent to an extension of the period of validity. The request and the responses thereto shall be made in writing (or by cable or telex or fax). The bid security provided under ITB Clause 15 shall also be suitably extended. A Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request will not be required nor permitted to modify its bid, except as provided in ITB Clause 16.3 hereinafter.
- 16.3 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 :

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.

16.4 Bid evaluation will be based on the bid prices without taking into consideration the above 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:

**Director, TEQIP  
Sector 25, South Campus, Panjab University,  
Chandigarh**

(b) bear the Project Name, **Technical Education Quality Improvement Programme[TEQIP]-Phase II** the Invitation for Bids(IFB) title and number **TEQIP-II/CH/CH1G01/18** , and a statement "Do not open before **11:30 Hrs on 07.09.2012.**"

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 **11:30 Hrs** on **07.09.2012** and in the following location:

**UIET,  
South Campus, Sector 25,  
Panjab University, Chandigarh.**

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 its 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.
- 24.1.1 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 document.

- 24.2 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.
- 24.3 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.
- 24.4 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.
- 24.5 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) *Spare Parts and After Sales Service Facilities in India:*

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.**

**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.



## **E. Award of Contract**

### **29. Postqualification**

- 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 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.
- 35.2 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<sup>1</sup>. 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"<sup>2</sup> 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"<sup>3</sup> means a misrepresentation or omission of facts in order to influence a procurement process or the execution of a contract;
- (iii) "collusive practice"<sup>4</sup> 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, non competitive levels; and
- (iv) "coercive practice"<sup>5</sup> 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.

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<sup>1</sup> 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.

<sup>2</sup> "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.

<sup>3</sup> "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.

<sup>4</sup> "Parties" refers to participants in the procurement process (including public officials) attempting to establish bid prices at artificial, non- competitive levels.

<sup>5</sup> "Party" refers to a participant in the procurement process or contract execution.

- (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<sup>6</sup>, 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<sup>7</sup> 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.

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<sup>6</sup> 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.

<sup>7</sup> 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.

**SECTION III: GENERAL CONDITIONS OF CONTRACT**

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**TABLE OF CLAUSES**

Clause Number	Topic	Page Number
1.	Definitions	22
2.	Application	22
3.	Country of Origin	22
4.	Standards	22
5.	Use of Contract Documents and Information	23
6.	Patent Rights	23
7.	Performance Security	23
8.	Inspection and Tests	23
9.	Packing	24
10.	Delivery and Documents	24
11.	Insurance	24
12.	Transportation	24
13.	Incidental Services	24
14.	Spare Parts	25
15.	Warranty	25
16.	Payment	25
17.	Prices	26
18.	Change Orders	26
19.	Contract Amendments	26
20.	Assignment	26
21.	Subcontracts	26
22.	Delays in Supplier's Performance	26
23.	Liquidated Damages	27
24.	Termination for Default	27
25.	Force Majeure	27
26.	Termination for Insolvency	27
27.	Termination for Convenience	27
28.	Settlement of Disputes	28
29.	Limitation of Liability	28
30.	Governing Language	28
31.	Applicable Law	28
32.	Notices	28
33.	Taxes and Duties	29
34.	Fraud and Corruption	29

## 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**

4.1 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 of 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.
- 7.3 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.
- 7.4 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 by the Purchaser in the Notification of Award. 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 of any warranty obligations under this Contract; and
  - (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 or 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 upon 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, its 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 its 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, as 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**

25.1 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.

25.2 For purposes of this Clause, "Force Majeure" means an event beyond the control of the Supplier and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but are not limited to, acts of the Purchaser either in its sovereign or contractual capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.

25.3 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 for 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 or 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
  - (f) 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<sup>8</sup>. 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"<sup>9</sup> 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"<sup>10</sup> means a misrepresentation or omission of facts in order to influence a procurement process or the execution of a contract;

(iii) "collusive practice"<sup>11</sup> 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, non competitive levels; and

(iv) "coercive practice"<sup>12</sup> 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 34.1 (e) below.

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<sup>8</sup> 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.

<sup>9</sup> "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.

<sup>10</sup> "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.

<sup>11</sup> "Parties" refers to participants in the procurement process (including public officials) attempting to establish bid prices at artificial, non- competitive levels.

<sup>12</sup> "Party" refers to a participant in the procurement process or contract execution.

- (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<sup>13</sup>, 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<sup>14</sup> 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.

34.2 Furthermore, Bidders shall be aware of the provision stated in sub-clause 24.1 (c) of the General Conditions of Contract.

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<sup>13</sup> 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.

<sup>14</sup> 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.

## **SECTION IV: SPECIAL CONDITIONS OF CONTRACT**

### **SECTION IV: SPECIAL CONDITIONS OF CONTRACT**

#### **TABLE OF CLAUSES**

<b><u>Item No.</u></b>	<b><u>Topic</u></b>	<b><u>Page Number</u></b>
1.	Definitions (GCC Clause 1)	32
2.	Country of Origin (GCC Clause 3)	32
3.	Performance Security (GCC Clause 7)	32
4.	Inspection and Tests (GCC Clause 8)	32
5.	Packing (GCC Clause 9)	33
6.	Delivery and Documents (GCC Clause 10)	33
7.	Insurance (GCC Clause 11)	33
8.	Incidental Services (GCC Clause 13)	33
9.	Spare Parts (GCC Clause 14)	34
10.	Warranty (GCC Clause 15)	34
11.	Payment (GCC Clause 16)	34
12.	Prices (GCC Clause 17)	35
13.	Sub-contracts (GCC Clause 21)	35
14.	Liquidated Damages (GCC Clause 23)	35
15.	Settlement of Disputes (GCC Clause 28)	35
16.	Notices (GCC Clause 32)	36
17.	Progress of Supply	36

## 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 **University Institute of Engineering and Technology, Chandigarh**
- (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 **University Institute of Engineering and Technology, Chandigarh [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 for 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 purchase 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) The acceptance test will be conducted by the purchaser/their consultant or any other person nominated by the purchaser, at its option. There shall not be any additional charges for carrying out acceptance tests. The supplier shall maintain necessary log in respect of the results of the tests to establish to the entire satisfaction of the purchaser, the successful completion of the test specified.

(iii) In the event of the equipments 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;
- (vi) Inspection Certificate issued by the nominated inspection agency, and the Supplier's factory inspection report; and
- (vii) 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 of 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 be .....hours of operation or **12** 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 all 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:

**\* On Final Acceptance 100**

**\* 100 percent of the Contract Price shall be paid on the successful completion and acceptance of On Final Acceptance**

*Edit the above Payment Terms as per below sample.*

- (i) *Advance Payment*: No advance payment.
- (ii) *On Delivery*: Eighty percent of the contract price shall be paid on receipt of Goods and upon submission of the documents specified in SCC Clause 6 above; and
- (iii) *On Final Acceptance*: The remaining twenty percent of the Contract Price shall be paid to the supplier within 30 days after the date of the acceptance certificate issued by the Purchaser's representative for the respective delivery.

## 12. Prices (GCC Clause 17)

- 17.1 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 0.07% 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 **UIET** 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 : **The Director,**

**Sector 25, South Campus Panjab University  
Chandigarh**

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:**

- Quantity offered for inspection and date;
  - Quantity accepted/rejected by inspecting agency and date;
  - Quantity despatched/delivered to consignees and date;
  - Quantity where incidental services have been satisfactorily completed with date;
  - Quantity where rectification/repair/replacement effected/completed on receipt of any communication from;  
consignee/Purchaser with date
  - Date of completion of entire Contract including incidental services, if any; and
  - 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**

<b><u>S. No.</u></b>	<b><u>Brief Description</u></b>	<b><u>Unit Price</u></b>	<b><u>Quantity</u></b>	<b><u>Delivery Schedule</u></b>	<b><u>Bid Security In Rupees</u></b>
1.	<b><u>Electrical Machine Trainer System</u></b>		<b><u>1</u></b>		
2.	<b><u>Brush Less DC Motor Trainer</u></b>		<b><u>1</u></b>		
3.	<b><u>Advance High performance Sensor experiment system</u></b>		<b><u>1</u></b>		
4.	<b><u>Advance PLC (Programmable Logic Control) with digital and Analog Input/ output, 9 nos. of modules</u></b>		<b><u>1</u></b>		
5.	<b><u>Power electronics trainer system with experimental panels</u></b>		<b><u>1</u></b>		
6.	<b><u>Power Engineering Trainer with Transmission Line</u></b>		<b><u>1</u></b>		
7.	<b><u>Power Engineering Trainer with Protection Relays-I</u></b>		<b><u>1</u></b>		
8.	<b><u>Process Control Trainer</u></b>		<b><u>1</u></b>		
9.	<b><u>Control training system with Computer Interface</u></b>		<b><u>1</u></b>		
10.	<b><u>DSP 67xx development system with</u></b>		<b><u>2</u></b>		

**SECTION VI: TECHNICAL SPECIFICATIONS**

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## 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.

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.



**SECTION VI - TECHNICAL SPECIFICATIONS**

[Text of Technical specifications to be inserted in the Bidding Documents by the Purchaser, as applicable]

**Electrical Engineering Department, Electrical Trainer, UIET, Panjab  
University, Chandigarh  
Tender Item to be purchased under TEQIP**

S. No	ITEM NAME	SPECIFICATIONS	Qty	Amount (In Rs.)
1.	<b>Advance High performance Sensor experiment system</b>	<p>Salient Features: Should have Master unit carrying useful experimental resources like Power supplies, DPMs, Computer Interface, Bar graph LED indicator Function Generator etc. while the central slot will carry replaceable experimental enclosure which has colorful screw less overlay showing circuit &amp; its connection tag numbers for easy connectivity. Should provide set of student workbook &amp; instructor guide with tables filled.</p> <p><b>Specification of Master Unit:</b></p> <p>DC supply +/- 12V, 500mA, Variable 7V to 14V @ 3Amp. Built in function generator O/p waveform- sine, triangle &amp; square, TTL O/p freq.- 1Hz to 200KHz in ranges with amplitude &amp; freq. control pots, o/p voltage 10Vpp.</p> <p><b>On board measurement:</b> DC volt -2V/20V1no. &amp; LED BAR graph with 10 LED indicator to display 0-2.5V or 0-4V input. Computer Interface Adapter: 4 ADC Channel, 1 DAC channel &amp; V to I function block, with lab view software based instrument panels on PC screen suitable for various sensor panels.. Operating voltage: 230V +/- 10%, 50Hz</p> <p><b>Specifications for following sensor experiment panels:</b></p> <p><b>1) Strain gauge Transducers</b></p> <p>Piezo resistive transducer for strain measurement Micrometer 0-20mm (Accuracy 0.01mm) for strain generation Strain gauges in half &amp; full Wheatstone bridge arrangement. Zero &amp; span adjustment for calibration with instrumentation amplifier. Experiments on Gauge factor determination, <math>\mu</math>Strain indicator, Displacement measurement using Strain gauges &amp; cantilever.</p> <p><b>Provision to connect external strain gauge based application set ups as follows.</b></p> <p>a) Piezo resistive transducer for pressure measurement (0-15psi/20psi), Pressure sensor (0-15/20psi), gage type, Pressure generating hand pump connected using T connector to the sensor &amp; Bourden pressure gauge for measurement &amp; calibration b) Piezo electric transducer for impact measurement with attenuator &amp; peak detector.</p>	01	

c) Force / Weight measurement using piezo transducer (0-20 kg weighing scale sensor).  
 d) Level measurement by measuring water column height using pressure sensor by bubbler method in 400mm calibrated acrylic water tank, water pump, vibratory air pressure pump, manual bypass valve mounted on a compact (190mm x 1000mm) panel.  
 e) Torque measurement setup consisting of trunnion mounted 1/4HP single phase 230Vac universal motor, piezo resistive force / torque sensor, loading pulley with 5kg spring balance (2Nos.).

**2) Displacement Sensing Transducers**

Micrometer 0-20mm/(Accuracy 0.01mm)  
 Zero & span adjustment for calibration of following transducers  
 Resistive linear transducer (0 -20mm), Capacitive linear transducer (0 -20mm), Capacitive angular transducer (0 – 90 degree C), Inductive linear transducer (0 - 20mm), LVDT transducer (0 -20mm or -10mm to +10mm)  
 Provision to connect external capacitance based level application sensor as follows:  
 Level measurement by capacitance transducer using 600mm calibrated acrylic water tank, water pump, Manual flow valve mounted on compact light weight (190x1000mm) panel.  
 Level measurement by rotary pot transducer using 600mm calibrated acrylic water tank, water pump, manual flow valve mounted on compact light weight (190x1000mm) panel.  
 Mounted resistive rotary transducer attachment 0 – 180°Span  
 Humidity measurement demonstrator using polymer hybrid sensor.

**3) Speed Sensing Transducers**

12V DC motor with speed varying from 0-4000rpm & rotating slotted wheel having 8 slots,  
 Speed transducers: Magnetic pickup, Photo reflective, Photo interruptive, Inductive pickup with envelop detector, Stroboscope, Hall sensor  
 Provision to connect external flow sensor as follows:  
 Flow measurement - Compact, lightweight arrangement of size (190mm X 700mm) with small water pump, turbine flow sensor (200LPH) & rotameter (200LPH).

**4) Sound Sensing Transducers**

40KHz gated oscillator to generate Ultrasonic sound waves.  
 Sound Sensors: Ultrasonic Distance measurement, Dynamic microphone as Sound / Audio sensor.

**5) Light Sensing Transducers**

Incandescent lamp with variable intensity

		<p>Light sensors: Photodiode with I to V converter, Phototransistor with I to V converter, Photo resistor/LDR with R to V converter using constant current source, Photovoltaic cell / Solar cell, Opto coupler, Laser diode, Infrared LED, Red LED</p> <p>Provision to connect external fiber optics application sensor as follows</p> <p>Elementary Fiber Optics : 3 nos of transmitter diodes (RED (660nm) / BLUE / IR (950nm),1 no detector (photo transistor),1m PMMA Cable Step Index Type (CRI=1.492, NA=0.5) with SMA Connector I/P's- TTL&amp;AC Coupled (0.4Vp-p), O/P's- AC, DC Coupled &amp; TTL O/P, Band Width : Analog =10Khz, Digital = 50Khz</p> <p>Experiments performed: Setting up ANALOG LINK (Study DC Characteristics &amp; frequency response of different transmitter diodes), Setting up DIGITAL LINK (observe effect of varying square wave frequency on receiver output). Needs external FG.</p> <p><b>6) Temperature Sensing Transducers</b></p> <p>Built in heat bar / mini oven driven by Power amplifier of sufficient wattage</p> <p>Temp. selection upto 95 degree C in 5 ranges with ON / OFF closed loop control.</p> <p>Temperature sensors: Thermocouple J with room temperature calibration pot ii) Thermocouple K with room temperature calibration pot, Thermister (100K), PT100, IC sensor (AD 590), Bimetallic switch.</p>		
2.	<p><b>Advance PLC (Programmable Logic Control) with digital and Analog Input/output, 9 nos. of modules</b></p>	<p>Allen Bradley Micrologix PLC. configurable to both 24v dc &amp; 230vac,</p> <p>Built in 24 V DC power supply, Optically isolated I/Os, Digital inputs &amp; outputs,</p> <p>Analog input/outputs, outputs relays and MOSFETS, 14 inputs, 10 outputs Isolated, I/O LED indication on front line panel, 64 Kbytes memory, I/O simulating devices (switches, Proximities, pushbuttons),program authorization by start and stop push buttons</p> <p>proximity switches both capacitive and inductive. Inputs and outputs should be available on self-oriented latching MS connectors for all inputs and outputs for user interface.</p> <p>Provision to interface PLC module with customized system and for student project interface. Industrial grade ms s. gray powder painted enclosure. Mains socket with self illuminated switch and dual fuse protection. Provision to hold spare fuse.</p> <p>RS-232 is a PC to PLC programming cable and Evaluation s/w key</p> <p>Simulation card(Basic input output study) . Through simulation card we connect input (switches) and output (and output Facility for GSM based alarm monitoring of Conditions , Facility of Stepper motor control system , with Powers supply . Facility for proximity / capacitive Based Control, and counting. (LED/ Motor) to the PLC</p> <p>Mimic application modules with LED / switches as Indicators &amp; I/Ps</p>	01	

		Sequential motor starter interface Star /delta starter interface DOL Starter Water level controller Reaction vessel interface Resistance welding interface Traffic Light interface Car parking interface Piston cylinder interface		
3.	<b>Brush Less DC Motor Trainer</b>	Brush Less DC Motor Trainer Powder coated sturdy Aluminum flat panel (table top) system, carrying various voltage components housed in plastic enclosures(panel).Instrumentation Power supply cum Multichannel DPM panel +5V, 300mA Multi channel DPM for digital display for speed <b>Panel 1:</b> 24VDC/3A power supply for BLDC motor] Speed display DPM <b>Panel 2:</b> BLDC controller circuit. BLDC motor. Tacho output <b>Panel 3:</b> Forward/reverse switch. Brake switch. Test points for PWM outputs Speed control Pot. <b>Panel 4:</b> Voltage: 24VDC Wattage:200W Max Speed: 2500RPM. Frame: 34, panel mounted Bidirectional Braking system	01	
4.	<b>Control training system with Computer Interface</b>	<b>PID CONTROL TRAINER &amp; PROCESSES</b> Should have facility to work with Analog as well as Digital PID. Should have facility to monitor behavior of the PID output & process variable on PC screen. User settable PID controller parameters for P, PI, PD & PID operations. Should have facility of graph printing for laboratory journal entries. Electronic desk should carry useful experimental resources like Power supplies, DPMs, Computer Interface, Analog PID controller with central slot to hold various replaceable experiment panels. Connection through sturdy 4mm Banana sockets & Patch cords. Set of Students workbook & Instructor's Guide should be provided. PC is not in scope of supply but P4/XP with parallel port needed.DC supply +/- 12V,500mA.1 $\phi$ sine reference for cosine firing 30Vpp max.17Vdc 500mA unregulated for driving pulse transformer A) DPM – 2nos. a) For temp upto 100°C & intensity in Lux (2000), b) For temp upto 500°C B) Analog Meter – 2nos. a) Center zero for display of process error (+9V), b) For MV/SP (0-2.5V) Operating voltage: selectable 220-240Vac +10% 50Hz Operating modes: Online monitoring / Data acquisition / PID Software should be provided.	01	

		<p>a) Simulator Mode, b) Process Monitoring Mode, c) PID controller Mode</p> <p>Built in function generator:  O/p waveform selectable sine, triangular &amp; square, O/p freq. range from 0.016Hz to 166Hz, 4 steps &amp; frequency control pot, Variable amplitude using potentiometer from <math>\pm 9V</math> max.</p> <p>Computer Interface Adapter: 4 ADC Channel, 1 DAC channel &amp; V to I function block</p> <p>Controller selection P, PI, PD, PID with slide switch</p> <p>Parameter settings: Integral Time <math>T_i</math> (0.5-25Sec), Derivative Time <math>T_d</math> (0-2Sec),</p> <p>Proportional Band <math>P_b</math> (5-200%), Set point (-9V- +9V)</p> <p>Modular Experimental Panels as follows are needed.</p> <p>Process Simulator Panel</p> <p>Functional blocks for Lag (3No.), Integrator (3No.), Transport Lag (1No.), Summer (2No.), Gain (1No.), Inverter (2No.) for constructing simulated Type 0,1,2,3 &amp; 1st, 2nd, 3rd Order processes to work under PID.</p> <p>Experiments with Lead / Lag / Lead - Lag compensators to control behaviors of matching processes using above function blocks</p> <p>Auto Tuning explained using ziegler Nicolas method I &amp; II.</p> <p>Drawing Bode plot &amp; Nyquist plots, transfer function determination.</p> <p>Level shifters (2No) 9V to 0-2.5V &amp; 0-2.5V to 9V</p> <p>2) Real life process control panel</p> <p>Thyristor Actuator panel</p> <p>Thyristor bridge based 0-200V/3A cosine firing circuit. Supports signal conditioning of RTD (PT100), Thermocouple K type &amp; Photodiode to output 0-2.5Vdc (FS). Should facilitates closed loop control experiments based on temperature, light intensity, speed measurement using built in P/PI controller as well as external Analog / Digital PID controller. Should have following real life process</p> <p>Process Temp/Light</p> <p>Process box contains 3 high wattage (60W) bulbs under aluminum plate heater.</p> <p>Built in fan, lamp as disturbance generator.</p> <p>Sensor RTD for temperature control upto 100 degree C with built in CAL facility, Photodiode for light intensity control upto 2000lux.</p> <p>High Temp</p> <p>Electric Bunsen burner (300W) with 500 degree C heating volume.</p> <p>Sensor: K type stainless tube encapsulated TC for temp control upto 500 degree C.</p> <p>B) Servo Interface panel</p> <p>Control Interface circuit for AC &amp; DC servo motor, signal conditioning circuit for speed sensor to</p>		
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		<p>output 0 - 2.5V dc (2500RPM) with speed direction. Level shifter 0 - 2.5V to <math>\pm 9V</math> (2nos). Hysteresis, Dead band &amp; Relay control circuit (2term &amp; 3 term), process block for 2Nos. of 1<sup>st</sup> order lag / integral + transport lag, error and gain block for process simulation. Should have following real life process DC servo position Control</p> <p>PMDC motor 12Vdc, 40W, ND RPM 2000RPM with gear box (Ratio 30:1) Loading: Servo amplifier with built in 12V / 3A Power Supply. Sensor: Photo reflective speed sensor with dir detects using 2 nos. of photodiodes. Servo pot as position feedback, position, speed, cascade control. AC servo position control</p> <p>AC geared (50:1) servo motor. Main winding 230VAC, control winding 6VAC/3A O/P shaft RPM 25 (D), ND RPM 2500. Loading: Using PMDC motor 12VDC, 40W, 2000RPM. Servo amplifier with built in 12V/3A Power Supply. Sensor: Servo pot as position feedback for position control.</p> <p>C) Stepper Motor demonstrator experiment panel</p> <p>Direction, speed, auto, manual operations of Stepper Motor, Position control by step operation, Position control by continuous operation, Angle control by step operation, Speed control by control switch, Angle control by software, Dynamic current / torque characteristics, Closed loop experiment with servo pot for PID experiments.</p>		
5.	<p><b>DSP 67xx development system with Video interface module Analog to digital converter modules</b></p>	<p>DSP Starter kit with TMS320C 6713 Development Board The C67xx DSK includes SDSMB of on-Board SDRAM and an emulation header with a MCASP, HPI And 12C interfaces. Other feature includes. 512K of no-volatile FLASH memory. 16 – Bit stereo codec Four 3.5-mm audio jacks. Standard JTAG interface with 8-pin connecto5r Plug-and-play JTAG support via USB Expansion port connectors for plug-in modules.+5-volt universal power supply - code Composer Studio IDE, <b>version latest with manual and example source codes (hard copy).</b> <b>High Speed Analog to digital converters Module</b> facility for daughter boards for four analog input channels and two analog output channels, performing analog-to-digital conversion at 6MSPS and digital-to-analog conversion at 165MSPS. THS1206 High-Speed 6MSPS ADCx1. 12-bit, 4 Single-Ended Analog Input. 5V Analog Single Supply Operation . 3V or 5V Digital Interface Compatible. Glueless DSP Interface . Integrated FIFO. Analog Input Range: -1~+1V DAC902 165M SPS DACx2 12-bit. 2 Single-Ended Analog Output. Single 3V or 5V Operation. Internal Reference. Analog</p>	02 each	

		<p>Output Range: -1~+1V</p> <p><b>Video Interface module</b></p> <p>The TFT LCD Video hardware module, compatible with TI 6X DSP processors ,For developing video processing algorithm, based on TMS320C6000TM DSP. Facility to acquires NTSC/PAL analog video signal and displays digital video data on TFT LCD display</p> <p>Input: NTSC/PAL, 30/25 fps ,Output: RGB565 ,Resolution: 320x240 16bit/pixel</p> <p>Must be supplied with TFT LCD video Modules, with CD (Manual, Example code, Datasheets)(<b>hardcopies</b>)</p>		
6.	<p><b>Electrical Machine Trainer System With</b></p> <p>3 phase AC integrated 300W m/c chasis mounted.</p> <p>3 phase salient pole synchronous Generator. Universal Motor AC/DC Integrated, 300W, Chasis mounted. Repulsion motor chasis mounted.</p>	<p>3 phase AC integrated 300W m/c chasis mounted.</p> <p>3 phase salient pole synchronous Generator. Universal Motor AC/DC Integrated, 300W, Chasis mounted. Repulsion motor chasis mounted.</p> <p><b>Powder Coated Sturdy Aluminium Flat Panel (table top) System, carrying various high voltage components housed in plastic enclosures (panel) to minimize shock possibility.</b></p> <p>Input 3 Phase DOL Starter panel:</p> <p>Pole MCB of 415 V/1A</p> <p>DOL 9A Contactor with 230V/50 Hz/11 VA COIL</p> <p>Bimetallic thermal O/L relay with range 1.4A-2.3A.</p> <p>Integrated AC ( 3/1 Phase) measurement panel:</p> <p>Consist of 2 nos of (48x96mm) Digital meters one each for 3φ &amp; 1φ Measures V, I, PF (0.2 lag-unity - 0.2 lead) Hz. Hence separate analog wattmeters (3φ, 1φ) are not needed.Current specs for 3φ meter = 1.5A (Balanced load) and 1A/5A for 1φ meter (170-250V).</p> <p>FWD/REV, Star-Delta Starter panel:</p> <p>FWD/REV, 3 pole 3 way switch with centre OFF,6A/440V</p> <p>Star/Delta switch 3 pole 3 way with centre OFF,6A/440V.</p> <p>3 Phase wound Rotor &amp; Sync. Motor panel :</p> <p>Rotor resistors of 30E/5A with 3 taps of 0E, 15E, 21E, 30E each - --- 3 nos.</p> <p>Rotor resistor selector switch, 3 pole 6 way 6A/440V</p> <p>DC Rotor excitation over current relay (3 Amp).</p> <p>1φ Motor, Alternator &amp; Sync. Motor panel:</p> <p>:</p> <p>1φ MCBs of 4A/1.6A - 2 nos.</p> <p>2no 2P2W selector switches to run as 1φ alternator then as synchronous motor</p> <p>8A pushbutton switch to simulate as centrifugal switch.</p> <p>DC voltmeter and DC ammeter panel:</p> <p>DC voltmeter (0-300V) b) DC Ammeter ,Field failure relay to control Armature supply. Both 6A/6B needed simultaneously.</p> <p>SCR Actuator (variable DC) cum sensor signal conditioning panel :</p> <p>Half bridge SCR based 0V-195V / 5 Amp cosine firing with linear characteristics. Supports signal conditioning circuit for speed, torque in kg wt to output 0-2.5Vdc (FS)3 Nos. of these supplies</p>	01	

required for DC Armature, DC motor field and AC generator field.  
Instrumentation Power supply cum Multichannel DPM panel:

+/- 12v, 500 mA (b) + 5v, 300 mA (c) Unregulated 17V dc/750 mA (d) line synchronizing signal.(e) 13V / 3 Amp. (f) Multi channel DPM for digital display of torque, speed etc.

Lamp Load, Resistor Load:

230V / 15/40/60/100W x 3 bulbs with individual ON/OFF using 6A toggle switch --- 4 nos. panels.AC Resistors = 10K/200Wx3 phases / 6 taps (2) DC Resistors = 750E/400W/6 taps.

LC Load 15A panel:

Inductive Load = 0.75H/3H/300mAX3 Nos. (B) Captivities Load = 1.25μ/2.5μ/5μ/415VX3 Nos.

**3 phase AC integrated 300W m/c chasis mounted:**

Voltage: 415VAC, 50Hz

Capacity/RPM /Terminals: 300W / 4 Pole m/c / 1500RPM

Rotor Construction: Star connected, four terminals

including star point brought out on 4 slip rings mounted on shaft

Stator Construction: Six terminals to be brought out to start the machine using STAR - DELTA starter.

Frame /Mounting Shaft dia: 100 Frame, Chasis mounted

19mm dia. with easily, swappable gear coupling

**3 phase salient pole synchronous Generator.**

Voltage: 415VAC, 50Hz

Capacity/RPM /Terminals: 300W / 4 Pole m/c / 1500RPM

Rotor Construction: Star connected, four terminals

including star point brought out on 4 slip rings mounted on shaft

Stator Construction: Separately excited field winding with laminated

solid yoke, 4 pole brought out on 2 terminals

Frame /Mounting Shaft dia: 100 Frame, Chasis mounted

19mm dia. with easily, swappable gear coupling

**Universal Motor AC/DC Integrated, 300W, Chasis mounted.**

Voltage: 230VAC, 50Hz/ 150 Vdc

Capacity/RPM /Terminals: 300W / 4 Pole m/c / 1600RPM/ 1500RPM 4 terminal.

Rotor Construction: Standard commutator brush arrangement brought out on 2 terminals

Stator Construction: Stator brought out on 2 terminals, to facilitate AC/ DC operation &

direction change. Built in compensating winding to minimize AR & sparking.

Frame /Mounting Shaft dia: 100 Frame, Chasis mounted

19mm dia. with easily, swappable gear coupling

**Repulsion motor chasis mounted.**

Voltage: 230VAC, 50Hz

Capacity/RPM /Terminals: 300W / 4 Pole m/c / 1500RPM/ 2 terminal.

Rotor Construction: Standard Commutator brush but short circuited

Stator Construction: Stator brought out on 2 terminals,



		settale handle to rotate brush position w.r.t. neutral axis. Frame /Mounting Shaft dia: 100 Frame, Chasis mounted 19mm dia. With gear coupling.		
7.	<b>Power electronics trainer system with experimental panels</b>	<p>Power Electronics Trainer System Should have Master unit carrying useful experiment resources like line Synchronised firing circuits, Power supplies, lamp load, RLC loads, Battery charging supply etc. while the central slot will hold replaceable experiment panels. Each multi experiment panel must be secured in an ABS molded plastic sturdy enclosure, and must have colorful screw less overlay showing circuit &amp; Connection through Sturdy 4mm Banana Sockets &amp; Patch Chords. DC supply : +/- 12V, 500mA, Unreg Power supply 17V / 750mA, Regulated 13.5V/3A O/P mustbe provided as 12V Battery charging supply. In absence of battery, same may be used as simulated battery source to run experiments on inverters etc. Isolated DC supply +12V/ 300mA with isolated common. On board Inverter transformer of Primary : 230V &amp; Secondaries 12-11-0-11-12/3A On board Lamp load of 15W (100W) should be provided. AC supply : 230V AC line voltage must be made available on two banana 4mm sockets. LSPT Panel consisting of Must have Two pulse transformers of 1:1:1 are provided for isolation &amp; supplying firing pulses along with required DC Power supply to experiment panel under test through 15 pin female 'D' connector. R-L-C Load Panel Must have Load resistor of 10W / 40W Must have Centre tapped 3A choke 4mH/ 16mH Must have Commutation capacitors of 10mF/100V Must have AC Paper capacitor of 4mF/440V Power scope + CT : Dual channel power scope (differential ) module, off the ground measurement, 1M impedance on any I/P. Range: X 1000. Modular experiment panels offered Semiconductor &amp; Power Semiconductor Devices Experiment Panel Must have high voltage (100-200Vdc supply for VI characteristics of SCR / TRIAC]. Silicon diode, Semiconductor Testing using Multimeter, Germanium diode, zener diode, LED, diac, bipolar transistor, Field Effect Transistor (FET), MOSFET, UJT, Silicon Controlled Rectifier (SCR), Triac, IGBT. 2) Power Semiconductor Application Experiment panel</p> <p>Shuold have Triac lamp dimmer, AC fan regulator, SCR operated light sensitive switch using LDR, SCR operated temperature sensitive switch using thermistor, UJT relaxation oscillator, Half</p>	01	

		<p>and full wave ( Phase shift controlled ) rectifier using SCR, Timer using SCR &amp; UJT. Built in Lamp load.</p> <p>3) Power Semiconductor Application Experiment Panel</p> <p>Should have SCR phase shift controlled converter using IC555 through opto isolator ( Potentiometric), Triac AC power control using IC 555 ( Potentiometric) (optoisolated), Triac AC power control using UJT ( Potentiometric), SCR/Triac temperature control using thermister, SCR/Triac intensity control using LDR, Opto isolated DC switch &amp; Photo relay</p> <p>4) CON / INV Panel</p> <p>SCR Converters must be Provided with sturdy 800V/12A SCRs (4nos) with uncommitted snubbers, 6A diodes (2nos) commutation switch, 47m/450V cap, Ramp cosine firing circuit. However actual working currents are limited to 3A (max) for safety. Must have facility to study Advanced firing Schemes, SCR forced Commutation Techniques, SCR based Inverters , Cycloconverter, SCR based Chopper.</p> <p>5) Triggering circuit / dv/dt Protection panel</p> <p>Must have facility to study SCR Triggering Schemes / turn ON methods.</p> <p>Traic Triggering Schemes / turn ON methods dv/dt behaviour of SCR</p> <p>6) SCR Application Panel</p> <p>must be able to Study Zero Voltage Line switching &amp; Integral cycle control using SCR.</p> <p>Study of SCR based Ring Counter for sequential switching.</p> <p>AC voltage control using SCR based transformer tap changer.</p> <p>SCR based AC flasher / DC flasher.</p> <p>7) IGBT / MOSFET Inverter Panel</p> <p>Should be able to study MOSFET / IGBT based step down Chopper.</p> <p>MOSFET / IGBT push pull inverter 200H/2000Hz.</p>		
8.	<p><b>Power Engineering Trainer with Protection Relays-I</b></p>	<p>Power Engineering Trainer with Protection Relays-I</p> <p>Specification:</p> <p>1 <math>\phi</math> motor , Alternator &amp; Sync. Motor panel</p> <p>1 MCBs of 4 A/ 1.6 A (2 no.) 2P2W selector switches to run as 1 <math>\phi</math> alternator then as synchronous motor.8A pushbutton switch to simulate as centrifugal switch.</p> <p>Variable Voltage &amp; current injector panel</p> <p>Consist of 1 phase mimmer 230 VAC/ 1A.</p> <p>Short circuit transformer with primary 230 VAC / 1A, secondary 1 V/ 20 A</p> <p>Over current &amp; elapsed time measurement panel</p> <p>Sonsists of AC ammeter of 20 A</p> <p>Elapsed time counter range 999.001 msec, resoulation 1 msec.</p> <p>Intefrated AC 1 Phase measurement panel</p> <p>Consist of 96x 96mm Digital meter one each for 1 <math>\phi</math> measures V, I, PF (0.2 lag unity 0.2 lead), Hz. Hence separate analog wattmeters (3 <math>\phi</math>, 1 <math>\phi</math>)are not needed</p>	01	

9.	<b>Power Engineering Trainer with Transmission Line</b>	<b>Specification:</b> <b>Input 3 Phase DOL Starter Panel</b> 4 pole MCB of 415 V/ 4A DOL 9 A contactor with 230 V/ 50Hz / 11VA COIL Bimetallic Thermal O/L relay with range 1.4A- 2.3 A. <b>Integrated AC (3/1 Phase ) Measurement panel</b> Digital Meter for measurement of 3 phase & 1 phase parameters. Voltage line to line & to neutral. Current for all 3 phase up to 5 A. Power Factor , Frequency , watts, VAR, VA & energy in KW/hr. <b>Transmission line panel</b> Simulated model for short transmission line using R & L components. Simulated model for medium length transmission line for II model. Simulated model for medium length Transmission line for T model. <b>Resistors Load</b> AC Resistors 10K/5K /3.5 K/2.5 K /2 K /1.5 K / off 200 WX3 phases/ 6 taps DC Resistors 750 E /600 E /300 E /212 E /162 E /125 E /112 E /100E /400 E /8 taps off <b>LC Load</b> Inductive Load 0.75 H/3 H/300mAX3 Nos. Capacitive load 1.2µF/ 2.5µF/5 µF /415 VX 3 Nos.	01	
10.	<b>Process Control Trainer PC based control of flow and level using PID as well as ratio, cascaded and feed forward Control schemes with pc of latest configuration</b>	1. Process Control Trainer (Flow, Level & control valve characteristics) should consist following specification: - A) Electrical specifications: Computer Interface panel Connects to PC (P4/XP) parallel port through 25 pin M to F cable / 1.5mtr. 4 ADC channels I/P : 0 to 2.5V FS with 1no input simulation pot. 1 DAC channel O/P 2.5V FS. V to I function block : I/P 0 to 2.5V & O/P 0-20 or 4-20mA (100Ω load) switch settable. I to V function block : I/P 4 to 20mA & O/P 0 - 2.5V Instrumentation Power supply cum Multichannel DPM panel +/-12V/500 mA , +5V/300mA, Unregulated 17V dc/750 mA, line synchronizing signal, 13V / 3 Amp., Multi channel DPM for digital display of process parameters. 20 pin FRC power bus to supply power to neighbouring panels. Thyristor Actuator cum signal conditioning panel (TAP) / CE2 x 2Nos. Optional s : Thyristor bridge based 0-200V/3A using cosine firing circuit, I/P 0 to 2.5Vdc. Supports signal conditioning for RTD, Pressure sensor with Instrumentation Amplifier & flow sensor (water / air) with F to V convertor to generate 0-2.5Vdc (FS). 2No.panels may be needed to cover signal conditioning needs of the selected process. PC (P4/XP/ FAT32) based PID controller (PC not in scope of supply. But P4/XP with parallel port needed.)Online monitoring /	01	

		<p>Data acquisition / PID Software</p> <p>Self extracting package (CD) works under 98, 2K, XP (PC is not in scope of supply).</p> <p>Operating modes</p> <p>Simulator Mode : Tests data stored in files (*.txt) &amp; Draw graph for all P,PI,PD &amp; PID modes. b) Process Monitoring Mode : Draw graphs of analog data presented at CH 0 &amp; CH 1 of CIP. Cursors for X &amp; Y axis for measurement &amp; online graphs saving for reproduction.</p> <p>PID controller Mode</p> <p>PID controller with parameter like Integral Time <math>T_i</math> (1-64000) , Sampling Time <math>T_s</math>(0.1- 99.9) ,Derivative Time <math>T_d</math>(0.1-99.9) ,Proportional Band <math>P_b</math>(1-999), Derivative Gain <math>K_d</math>(1-999) , Set Value <math>R_n</math>(0-99.9), PID output Upper Limit <math>U_h</math>(0-99.9), PID output Lower Limit <math>U_l</math> (0-99.9), Settable PWM output Cycle Time <math>C_t</math> (0.1-999).Facility to set units for output viz. (%), V, mm, LPH, kg/cm<sup>2</sup>, °C. Optionally experiments with advance process control scheme viz; Ratio, Cascade, feedforward with Aux PID, Ratio station &amp; FF transfer function calculator, Alarm setting, ON/OFF control, square root extractor, PWM output, etc.</p> <p>Process specifications:</p> <p>Control medium used for this unit should be water.</p> <p>Storage tank should be plastic PVC with 50Ltr tank.</p> <p>Process tank should be plastic PVC with 20Ltr tank &amp; it is mounted vertically.</p> <p>Sensor for flow should be Turbine Flow Sensors 1 no. + 1 no. Orifice plate with Differential pressure transmitter/sensor, (0-5 PSI).</p> <p>O/P should vary from 0 to 2.5V &amp; range should be 0-200LPH.</p> <p>Sensor for Level should be WC pressure sensor 0 to 500mm.Bubbler method should be used for level measurement.</p> <p>O/P should vary from 0 to 2.5V.</p> <p>Control valve should be Pneumatically operated air to close, linear type, 1/2" size Diaphragm operated, CV = 0.4 with I to P. Converter I/P 4 to 20mA O/P 3 to 15 psi.</p> <p>2 nos., Acrylic body 1/2"size 0 to 200LPH Rotameter should be used.</p> <p>Generation &amp; Distribution pump should be 1 no. 0.062KW, 1/12HP, 2800RPM, 1/2" outlet, 500 LPH. Head 9 meters, with brass impeller.4 Nos.(0 to 2 bars = 3 nos., 0 to 500mm of water column= 1no.) Bourdon Pressure Gauge should be used.Manual SS valve should be used 1/2" size =6 nos., 1/4" size = 3 nos.Piping material should be Stainless steel with size 1/2" for water, 1/4" for air.</p> <p>Air Filter &amp; Regulator should be 2 nos, 0 to 10 bars, size 1/4", Oil catcher (1/4" size max. pressure = 10 bars) – 1No.</p>		
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**SECTION VI-A : QUALIFICATION CRITERIA**

(Referred to in Clause 13.3(b) of ITB)

<b><u>Qualification Criteria</u></b>
<b><u>Is Minimum Financial Turnover met in at least once of the last three years excluding current financial year?</u></b>
<b><u>Satisfactory delivery of similar goods/items of value not less than 80% of estimated contract value in less than 3 years.</u></b>
<b><u>VAT Number</u></b>

**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	Purpose of Commission or gratuity
Name and address of agent		

\_\_\_\_\_  
(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**

Whereas .....<sup>1</sup> (*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)

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<sup>1</sup> *Name of Bidder*

**SECTION IX: CONTRACT FORM**

**SECTION IX: CONTRACT FORM**

THIS AGREEMENT made the .....day 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:

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SL. NO.	BRIEF DESCRIPTION OF GOODS & SERVICES	QUANTITY TO BE SUPPLIED	QUANTITY TO PRICE	UNIT	Total Price	DELIVERY TER
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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:.....

Signed, Sealed and Delivered by the

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 the .....day 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 stockists.)*

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 to 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 2000<sup>1</sup>

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 IDA<sup>2</sup>.

- 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:

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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: <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