UNIVERSITY OF ENGINEERING AND TECHNOLOGY MARDAN

KHYBER PAKHTUNKHWA

STANDARD BIDDING DOCUMENTS

FOR

SUPPLY OF LAB EQUIPMENT FOR MECHANICALENGINEERING DEPARTMENT UNDER THE PROJECT TITLED "ESTABLISHMENT AND UPGRADING OF CORE ENGINEERING DEPARTMENTS AT UET MARDAN"

PROCUREMENT REF. NO. 06/HEC/2021

Last Date/Time for Submission:	26th May, 2021 at 10:00 AM
Bid Opening Date/Time:	26th May, 2021 at 10:30 AM
Venue:	Conference room, UET Mardan
Email:	po@uetmardan.edu.pk

Price: 2500/-

TABLE OF CONTENTS

1. Invitation for Bids

Date: _____

Bid Reference No.: _____

1. The University of Engineering and Technology Mardan, KPK has received an allocation from the Public Fund in PKR/Foreign Currency towards the cost of the project titled "Establishment and Upgrading of Core Engineering Departments at UET Mardan". It is intended that part of the proceeds of this allocated fund will be applied to eligible payments under the contract for supply and installation of lab equipment/apparatus.

2. The University of Engineering and Technology Mardan, KPK, invites sealed bids from eligible firms or company registered with relevant govt. authority. A foreign bidder is entitled to bid only in a joint venture with a Pakistani supplier/agent in accordance with the provisions of PEC bye-laws. Bidders may obtain further information from, inspect at and acquire the Bidding Documents from the Purchase Section, UET Mardan from 10.00 am to 02.00 pm.

3. A complete set of Bidding Documents may be purchased by an interested bidder on submission of a written application to the above office and upon payment of a non-refundable fee of Rs.2500.

4. The provisions in the Instructions to Bidders and in the General Conditions of Contract are the provisions of the Khyber Pakhtunkhwa Public Procurement Act and its Rules made thereunder which also conform to the requirements of the World Bank Standard Bidding Documents: Procurement of Goods for National Competitive Bidding, Pakistan, Part One.

5. All bids must be accompanied by a Bid Security equal to 2% of the Bid amount and must be delivered to Procurement Officer, Purchase Section, UET Mardan from 10.00 am to 02.00 pm on or before May 26, 2021, 10:00 am. Bids will be opened at 10:30 am on the same day, in the presence of bidders' representatives who choose to attend at the same address. The Bid security amount shall not be disclosed to any person.

3. General Terms		
1	Introduction	1.1 Bidders shall adhere to all the terms and conditions of the requirements of instructions to bidders (ITB), including any amendments made from time to time as KPPRA rules/regulation. This ITB will be governed under "Single Stage, two Envelope Procedure" of Khyber Pakhtunkhwa Public Procurement Rules, 2014, as amended from time to time and instructions of the Government of Khyber Pakhtunkhwa received during the completion of the project. 1.2 Any Bid submitted will be regarded as an offer by the Bidder and does not constitute or imply the acceptance of the Bid by UET Mardan. The Institute is under no obligation to award a contract to any Bidder as a result of this ITB. 1.3 UET Mardan reserves the right to cancel the procurement process at any stage without any liability of any kind for Institute, as per KPPRA rules.
2	Fraud & Corruption	2.1 UET Mardan strictly enforces a policy of zero tolerance on proscribed practices, including fraud, corruption, collusion, unethical or unprofessional practices, and obstruction of institute vendors and requires all bidders/ vendors observe the highest standard of ethics during the procurement process and contract implementation.
3	Eligibility Criteria	3.1 Bidder shall not be suspended, debarred, or otherwise identified as ineligible by any Government/ Semi-government/ or any other international Organization. Bidders are therefore required to disclose to UET Mardan whether they are subject to any sanction or temporary suspension imposed by these organizations. 3.2 It is the Bidder's responsibility to ensure that its employees, sub-contractors, service providers, suppliers and/ or their employees meet the eligibility requirements as established by UET Mardan.
4	General Terms	4.1 The Bidder shall be registered with Sales Tax, Income Tax Department as well as with relevant tax Authorities. 4.2 The Bidder shall have not been blacklisted by any Government/ semi Government organization. 4.3 There shall be no litigation against the bidder/ firm.
4. Preparation of Technical Bid		
5	Brief profile of Bidder firm/ Company	5.1 Bidder shall provide company introduction, type of business, offices & services in Pakistan, NTN & GST registration number with copy of NTN & GST certificates, professional staff (administrative & technical), verifiable office addresses, Telephone & Cell No., E-mail address for Contacts etc.
6	Detail of Experience	6.1 Bidder shall provide list of contracts in-hand along with the name of organization, complete address, year of contract, contract value, date

		of contract award and shall provide contract completion certificate/Satisfactory Report for all those contract which they have already completed/performed.
7	Detail of Items & Specifications	7.1 Bidder shall provide detail of items, brands, country of origin with complete specification being offered, without mentioning prices, on company letter head (duly signed and stamped beneath by the bidder).
8	Reputation & Reliability of Brand, Manufacturer & Country of Origin of Products	8.1 The Bidder shall provide supported brochures of quoted items for better understanding of brand, make and specification, country of origin and reputation of brand & manufacturer in relevant business market.
9	Bidder's Corporate Status or Affiliation of Bidder with Products manufacturer	9.1 Bidder specify and mention clearly on bid whether the bidder firm is; a. Manufacturer b. Business partner of manufacturer c. Sole distributor of manufacturer d. Authorized distributor/agent/reseller/supplier e. Any other affiliation (Provide certificate/letter issued from manufacturer as supporting document to certify affiliation with manufacturer)
10	Technical Resources & Services Support	10.1 Mention in detail the in-house resources, facilities and technical support available from the bidder for installation, up-gradation, configuration, commissioning and after sales services of equipment.
11	Warranty/Guarantee Terms	11.1 The bidder shall offer 01-year warranty/guarantee standard warranty terms of manufacturer **(after sales & service)**
12	Project Implementation (Maximum 12-16 weeks)	12.1 Delivery, installation, commissioning, testing & execution, operation and training should be completed within 12-16 weeks .
13	Cost of Preparation of Bid	13.1 The Bidder shall bear all costs related to the preparation and/ or submission of the Bid, regardless of whether its Bid is selected or not.
14	Documents Comprising the Bid	14.1 The Bid shall comprise of the following documents and related forms, details of which are provided in the Bid Data Sheet (BDS). All pages of the Bid shall be signed, stamped and properly paginated. a) Returnable Forms shall be properly filled in Ink or Typed. Forms filled in using a pencil shall not be considered and substantiate the annulment of the Bid Proposal. b) Documents establishing the eligibility and qualifications of the bidder; c) Bid covering Technical Specifications in detail, and covering Price Schedule; d) Bid Security, as mentioned BDS; e) Any attachments and/ or appendices to the Bid.

15	Technical Bid Format and Content	15.1 The Bidder is required to submit a bid using the Standard Forms and templates provided in the ITB. 15.2 When applicable and required, the bidder shall describe necessary training program available for the maintenance and operation of the equipment offered as well as cost to the Institute. Unless otherwise specified, such training as well as training materials shall be provided in the language of the Bid as specified in the BDS. 15.3 When applicable and required, the bidder shall certify the availability of spare parts for a period of at least five (5) years from date of delivery, or as otherwise specified in this ITB.
16	Price Schedule	16.1 The Price Schedule shall be prepared using the Forms provided in the ITB and taking into consideration the requirements in the ITB. 16.2 Any requirement described in this ITB but not priced in the Price Schedule, shall be assumed to have been included in the prices of other activities or items, as well as in the final total price.
17	Bid Security	17.1 A Bid Security shall be provided in the amount and form indicated in the BDS. The Bid Security shall be valid for the duration of BDS. 17.2 The Bid Security will be forfeited by institute, and the Bid rejected, in the event of any, or combination, of the following conditions: a) If the Bidder withdraws its offer during the period of the Bid Validity specified in the BDS, or; b) In the event the successful Bidder fails: i. to sign the Contract after institute has issued an award letter; or ii. to furnish the Performance Security, insurances, or other documents that institute may require as a condition precedent to the affectivity of the contract that may be awarded to the Bidder. c) The Bidder shall submit an affidavit on stamp paper with the technical bid that "the requisite Bid Security of 2% of the total bid has been placed separately in the sealed envelope of financial bid". In Affidavit the amount of Bid Security shall not be disclosed by any mean. In case of failure of submission of an affidavit for bid security with the technical bid, or disclosing the bid amount indirectly, the bid shall be rejected by the Purchaser
18	Bid Validity	18.1 90 days from the date of opening of Financial bid.
5. Preparation of Financial Bid		
20	Bid Prices	20.1 Each offered item to be entered separately (with unit & total cost) inclusive of cost of equipment, air freight (Islamabad), Sea Freight (Karachi) and transportation charges upto UET Mardan. Delivery of equipment, installation, testing, commissioning, operational and training etc. (as and where applicable) will also be responsibility of the bidder/supplier. The bid must be made on company letter head either

		by foreign principal/ manufacturer of quoted items or the authorized agent/dealer/ bidder in Pakistan (duly signed and stamped beneath by the bidder firm/company or authorized person). **(Price for equipment shall be quoted as C&F (Karachi/Peshawar) (exclusive of custom duties and insurance)**
21	Bid Validity	21.1 90 Days from the date of opening financial tenders.
22	Amount of Earnest Money	22.1 2% of total bid amount
23	Form of Earnest Money	23.1 CDR from the scheduled bank in favor of the Treasurer, UET Mardan, shall be attached by the bidder.
6. Sealing, Submission and Opening of Bid		
24	Bid Proposal Submission	24.1 The bidder shall submit a duly signed and numbered all pages of the Complete bid in an envelope sealed and marked in accordance with KPPRA rule. 24.2 The envelope should contain all the returnable forms (A – G) along with technical specifications meeting or exceeding the requirements as stipulated in this ITB, and supporting documents in accordance with requirements in the BDS. 24.3 The bid security as referred in BDS must be placed in the bid envelope. An affidavit on stamp paper be placed in the technical bid stating that "the requisite Bid Security of 2% of the total bid has been placed separately in the sealed envelope of financial bid". 2% bid security in the shape of CDR be placed in the financial quotation. 24.4 Bid can be delivered either personally, or by courier as specified in the BDS. 24.5 The bid shall be signed by the bidder or person(s) duly authorized to Commit the Bidder. The authorization shall be communicated through a document evidencing such authorization issued by the legal representative of the bidding entity, or a power of attorney accompanying the bid. There should be no errors and/ or over-writings. Corrections (if any) should be made clearly and initialed with dates. 24.6 Bidders must be aware that the mere act of submission of a bid, in and of itself, implies that the bidder fully accepts the general contract terms and conditions. 24.7 Hard copy submission by courier or hand delivery allowed or specified in the BDS shall be governed as follows: a) The signed bid shall be marked "Original", and its copies marked "Copy" as appropriate. The number of copies is indicated in the BDS. All copies shall be made from the signed original only. If there are discrepancies between the original and the copies, the original shall prevail. b) The bid proposals must be sealed and submitted in an envelope, which shall: i. Bear the name of the Bidder;

		ii. Be addressed to UET Mardan as specified in the BDS; and iii. Bear a warning not to open before the time and date for bid opening as specified in the BDS. iv. Technical and financial bids be sealed in separate envelopes bearing names as "Technical Bid" and "Financial Bid". If the envelope with the bid is not sealed and marked as required, the institute shall assume no responsibility for the misplacement, loss, or premature opening of the bid.
25	Deadline for Submission of Bids and Late Bids	25.1 Complete bids must be received by UET, Mardan in the manner, and no later than the date and time, specified in the BDS. The institute shall only recognize the actual date and time that the bid was received by UET, Mardan. 25.2 UET, Mardan shall not consider any bid that is received after the deadline for the submission of bids.
26	Withdrawal, Substitution, and Modification of Bids	26.1 A Bidder may withdraw, substitute or modify its bid after it has been submitted at any time prior to the deadline for submission. 26.2 A bidder may withdraw, substitute or modify its bid by sending a written notice to UET, Mardan, duly signed by an authorized representative, including a power of attorney. The corresponding substitution or modification of the bid, must accompany the respective written notice. All notices must be submitted in the same manner as specified for submission of bids, by clearly marking them as "WITHDRAWAL" "SUBSTITUTION," or "MODIFICATION". 26.3 Bids requested to be withdrawn shall be returned unopened to the bidders, except if the bid is withdrawn after the bid has been opened.
27	Bid Submission Venue	27.1 Bids shall be submitted at the venue as mentioned in the BDS.
28	Bid Opening Date and Venue	28.1 Bids shall be opened on the date and venue as mentioned in the BDS.
29	Bid Announcement	29.1 Public announcement of bids shall be made after being opened by authorized officials of UET, Mardan in presence of participating bidders or their deputed representative who like to be present at the designated date, time & venue.
7. Bids Evaluation Criteria		
30	Confidentiality	30.1 Information relating to the examination, evaluation, and comparison of bids, and the recommendation of contract award, shall not be disclosed to bidders, even after publication of the contract award. 30.2 Any effort by a bidder to influence UET, Mardan in the examination, evaluation and comparison of the Bids or contract award decisions may, at institute's decision, result in the rejection of its Bid and may subsequently be subject to consequences.
31	Preliminary Examination	31.1 UET, Mardan shall examine the bids to determine whether they are complete with respect to minimum documentary requirements, whether the documents have been properly signed, and whether the bids are generally in order, among other indicators that may be used at this stage. The institute reserves the right to reject any bid at this

stage. The documents shall be examined preliminary as per following check list: -

S.No	Description	Compliance (yes/No)
01	Covering Letter/Application (on the letter head of the firm)	
02	Receipt of tender fee attached	
03	Profile of the Firm: Complete Introduction+ Type of Business + Offices & Services in Pakistan, Professional Staff (Administrative & Technical) + Verifiable Office addresses, Telephone & Cell No., E-mail address for Contacts.	
04	Proof of Active Taxpayer.	
05	Sales Tax Registration	
06	National/Income Tax Certificate	
07	Professional Tax Certificate, if any	
08	Earnest Money @2% of the quoted bid value along with financial bid. (The bidder shall submit an affidavit on stamp paper with the technical bid that the "requisite bid security of 2% of the total bid value attached in the sealed envelope of financial bid" (Mandatory)	
09	The documents dully signed and stamped(Mandatory)	
10	Affidavits on Judicial stamp paper attested by Oath Commissioner that, the Service Providing Firm has never been blacklisted by private, Govt., Semi Govt. and Autonomous Body) (Mandatory)	
11	To furnish Power of attorney for the authorized person	
12	Financial Proposal as per Annexure-III	
13	Agreement (For successful bidder only) as per Annexure-IV	

<table>
<tr><td></td><td></td><td colspan="4">The preliminary examination will be conducted on a responsive and non-responsive basis. Only bids which have been rated "responsive" in the preliminary examination of bids shall be considered for further evaluation.</td></tr>
<tr><td></td><td></td><td colspan="4"></td></tr>
<tr><td>32</td><td>Technical Bid Evaluation</td><td colspan="4">32.1 Technical bids will be scrutinized, examined and evaluated on following setout evaluation standard:</td></tr>
<tr><td></td><td></td><td>S #</td><td colspan="2">Mandatory Requirement</td><td>Scale of Evaluation</td></tr>
<tr><td></td><td></td><td>1</td><td colspan="2">Technical Compliance: Provide Technical Compliance Sheet (Form F)</td><td>30 Marks</td></tr>
<tr><td></td><td></td><td>2</td><td colspan="2">Literature in support of specifications, broachers, booklet etc.</td><td>05 Marks</td></tr>
<tr><td></td><td></td><td>3</td><td colspan="2">Country of Origin: USA (20 Marks), European Union, Germany, UK, Poland, Spain, Japan, Italy (15 Marks), Thailand, China (10 Marks)</td><td>20 Marks</td></tr>
<tr><td></td><td></td><td>4</td><td colspan="2">Reputed universities experience where particular equipment’s delivered (attach letter of performance/Satisfactory Completion Report) Marks per University (05 Marks)</td><td>10 Marks</td></tr>
<tr><td></td><td></td><td>5</td><td colspan="2">Guarantee / Warranty (Minimum 1 year or more)</td><td>03 Marks</td></tr>
<tr><td></td><td></td><td>6</td><td colspan="2">Provision of after sales services</td><td>02 Marks</td></tr>
<tr><td></td><td></td><td></td><td colspan="2">TOTAL</td><td>70 Marks</td></tr>
<tr><td></td><td colspan="5">* Minimum 70 percent marks (42 out of 70) in technical for qualification
**Lowest will get 30 marks and subsequently higher bids will get proportionally less marks.</td></tr>
<tr><td>33</td><td>Financial Bid Evaluation</td><td colspan="4">33.1 After evaluation/marking of bidders in technical evaluation process, Financial bids of only technically qualified bidders will be opened and preliminary scrutinized for following necessary parameters.</td></tr>
<tr><td></td><td></td><td>S #</td><td>Parameter</td><td>Mandatory Requirement</td><td></td></tr>
<tr><td></td><td></td><td>1</td><td>Bid Prices & Entries</td><td colspan="2">Each offered item to be entered separately (with unit & total cost preferably) inclusive of cost of equipment air freight (Islamabad) and sea freight (Karachi) and transportation charges up to UET, Mardan. duties/ taxes of shipment, installation/testing/commissioning /operational training etc. (as and where applicable) will also be responsibility of the bidder/supplier. However, installation/testing/ commissioning/ operational training etc. (as and where applicable) will also be responsibility of the bidder/supplier. The bid must be made on company letter head either by foreign principal/manufacturer of quoted items or the authorized agent/dealer/ bidder in Pakistan himself (duly signed and stamped beneath by the bidder firm/company or authorized person).
(Quoting prices in C&F are mandatory. Otherwise quotations will be rejected).</td></tr>
</table>

		2	Bid Validity	90 Days from the date of opening financial tenders.
		3	Amount of Earnest money	2% of total bid amount
		4	Form of Earnest Money	CDR from the scheduled bank in favor of the UET, Mardan, shall be attached by the bidder
		5	Registration of Firm	NTN & GST Registration Certificates shall be attached by the bidder.

After initial scrutiny of above factors of financial bids, comparative statement of prices will be prepared. The lowest bid will get highest marks which are 30. All other bids will be assigned marks according to the following formula:

$$30 - \left(\frac{r_i - R}{r_i}\right) \times 25$$

where r_i is the rate quoted by i-th bidder and R is the lowest bid (rate).

34	Due diligence	30.1 UET, Mardan reserves the right to undertake a due diligence exercise, aimed at determining to its satisfaction, the validity of the information provided by the bidder. Such exercise shall be fully documented and may include, but need not be limited to, all or any combination of the following: a) Verification of accuracy, correctness and authenticity of information provided by the Bidder; b) Validation of extent of compliance to the ITB requirements and evaluation criteria based on what has so far been found by the evaluation team; c) Inquiry and reference checking with Government entities with jurisdiction on the bidder, or with previous clients, or any other entity that may have done business with the bidder; d) Inquiry and reference checking with previous clients on the performance on on-going or completed contracts, including physical inspections of previous works, as deemed necessary; e) Physical inspection of the bidder's offices, branches or other places where business transpires, with or without notice to the Bidder; f) Other means that institute may deem appropriate, at any stage within the selection process, prior to declaring the bidder as qualified.
35	Clarification of Bids	35.1 To assist in the examination, evaluation and comparison of bids UET, Mardan may, at its discretion, request any bidder for a clarification of its bid. 35.2 UET, Mardan request for clarification and the response shall be in writing and no change in the prices or substance of the bid shall be sought, offered, or permitted, except to provide clarification, and

		confirm the correction of any arithmetic errors discovered by institute in the evaluation of the bids in accordance with the ITB. 35.3 Any unsolicited clarification submitted by a bidder in respect to its bid, which is not a response to a request by UET, Mardan, may not be considered during the review and evaluation of the bids.
36	Responsiveness of Bid	36.1 UET, Mardan determination of a bid's responsiveness will be based on the contents of the bid itself. A substantially responsive bid is one that conforms to all the terms, conditions, specifications and other requirements of the ITB without material deviation, reservation, or omission. 36.2 If a bid is not substantially responsive, it may be rejected by UET, Mardan, and may not subsequently be made responsive by the bidder by correction of the material deviation, reservation, or omission.
37	Right to Accept, Reject, Any or All Bids	37.1 UET, Mardan reserves the right to accept or reject any proposal in response to the ITB, to render any or all of the proposals as non-responsive, and to reject all proposals in response to the ITB at any time prior to award of contract, while assigning the reason(s) thereof.
38	Nonconformities, Reparable Errors and Omissions	38.1 Provided that a bid is substantially responsive, UET, Mardan may waive any nonconformities or omissions in the bid that, in the opinion of UET, Mardan, do not constitute a material deviation. 38.2 UET, Mardan may request the bidder to submit the necessary information or documentation, within a reasonable period, to rectify nonmaterial nonconformities or omissions in the bid related to documentation requirements. Such omission shall not be related to any aspect of the price. Failure of the bidder to comply with the request may result in the rejection of its bid. 38.3 For the Price Schedule that are submitted UET, Mardan shall check and correct arithmetical errors as follows: a) if there is a discrepancy between the unit price and the line item total that is obtained by multiplying the unit price by the quantity, the unit price shall prevail and the line item total shall be corrected, unless in the opinion of UET, Mardan there is an obvious misplacement of the decimal point in the unit price; in which case, the line item total as quoted shall govern and the unit price shall be corrected; b) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and c) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail. 38.4 If the bidder does not accept the correction of errors made by UET, Mardan, its bid shall be rejected.

39	Bidder Grievance	1. UET, Mardan grievance readdress procedure provides an opportunity for appeal to those persons or firms not awarded a contract through a competitive procurement process. In the event that a bidder believes that it was not treated fairly, the bidder may lodge a complaint to the Bidder Grievance Readdress Committee, UET, Mardan.
8. Award of Final Contract		
40	Evaluation	40.1 UET, Mardan will conduct the evaluation solely on the basis of response to this tender received from the firms. 40.2 Evaluation shall be undertaken in the following steps: a) Preliminary Examination including Technical Specifications and other compliances
41	Integrity Pact	41.1 Bidders will also be required to submit a signed Integrity Pact on a stamp paper of appropriate value as part of their response. The text of Integrity Pact is available at Annexure-I.
42	Contract Signing	42.1 After the approval of any Work Award, a Contract Agreement on the stamp paper of appropriate value, shall be executed by UET, Mardan, with selected bidder within 15 days from the date of issuance of LoI (Letter of Intent)/ Work Order. 42.2 Failure to signing of Contract Agreement by the selected bidder firm with UET, Mardan within the stipulated time may constitute sufficient grounds for the annulment of the award, and forfeiture of the bid security, if any, and on which event, UET, Mardan may award the contract to the second highest rated bidder or call for new proposals.
43	Right to Vary quantity at the Time of Award	43.1 At the time of award of Contract, UET, Mardan reserves the right to vary the quantity of goods without any change in the unit price or other terms and conditions.
44	Sample draft Contract	44.1 A sample draft contract to be signed, containing applicable general terms and conditions can be found at Annexure – II.
45	Performance Security	45.1 A performance security shall be provided in the amount specified in BDS, well prior to the contract signing by both parties. Where a performance security is required, the receipt of the performance security by UET, Mardan shall be a condition for rendering the contract effective. The amount of performance security, as a percentage of the Contract Price, shall be 10% of the total contract value which shall be retained by the Purchaser for the warranty period.
46	Bank Guarantee for Advanced Payment	46.1 No Payment will be released in advance.
47	Liquidated Damages	47.1 UET, Mardan shall apply liquidated damages for the damages and/ or risks caused to UET, Mardan resulting from the contractor's delays or breach of its obligations as per contract. a) In case of delay, the Procurement Committee, UET, Mardan reserves the right to impose a penalty not exceeding 10% of the total amount of the contract Value at the rate as referred in the sample contract at Annexure – II.

		b) If the contractor fails to complete work as per UET, Mardan requirement, the Vice Chancellor on the recommendation of Procurement Committee, UET, Mardan reserves the right to reject contract, altogether or impose a penalty not exceeding 50% of the total amount of the contract. c) If the contractor fails to provide supplies/ services as per UET, Mardan requirements, UET, Mardan may forfeit his earnest money as well as Performance Security, and the work will be done at the risk and cost of contractor. d) In case of any dispute, matter will be referred to Vice Chancellor UET, Mardan, whose decision will be binding on both the parties.
48	Force Majeure	48.1 "Force Majeure" means an event which is beyond the reasonable control of a party and which makes a party's performance of its obligations under the Purchase Order/ Work Order/ Contract impossible or so impractical as to be considered impossible under the circumstances, and includes, but is not limited to, War, Riots, Storm, Flood or other industrial actions (except where such strikes, Lockouts or other industrial issues are within the power of the party Invoking Force Majeure), confiscation or any other action by Government agencies. In all disputes between the parties as to matters arising pursuant to this Purchase Order/ Work Order/ Contract, the dispute will be referred to Vice Chancellor, UET, Mardan whose decision will be final.
	Delivery of Goods	49.1 Contractor will be required to deliver the goods as per the Delivery Schedule referred in BDS without claiming any additional cost to the UET, Mardan at the designated site(s) and in quantities as referred in the contract.
50	Payment Provisions	50.1 Payment will be made only upon UET, Mardan acceptance of the goods and/ or services performed. The terms of payment shall be within thirty (30) days, after receipt of invoice, and certification of acceptance of goods and/or services issued by the relevant authority, UET, Mardan. Payment will be affected by bank transfer in the currency of the contract. 50.2 The contractor shall provide all necessary supporting documents along with GST invoice, delivery challan and any other relevant documents as required by UET, Mardan.

3. Bid Data Sheet

The following data for the goods and/ or services to be procured shall complement, supplement, or amend the provisions in the Invitation to bid. In the case of a conflict between the Instructions to Bidders, the Bid Data Sheet, and other annexures or references attached to the Bid Data Sheet, the provisions in the Bid Data Sheet shall prevail**.**

BDS No.	Data	Specific Instructions / Requirements
1	Name of Procuring Agency	University of Engineering and Technology, Mardan, KPK
2	Loan or credit	N/A
3	Name of Project.	Establishment and Upgrading of Core Engineering Departments at UET Mardan
4	Name of Contract.	Supply of Labs equipment for Mechanical engineering department under the project titled "establishment and upgrading of core engineering departments at UET, Mardan"
5	Procuring Agency's address	University of Engineering and Technology, Mardan, Charsadda Road, Mardan
6	Language of the bid.	English
7	Submitting Bids for Parts or subparts of the Schedule of Requirements (partial bids)	The Purchase Committee shall consider the bids item-wise.
8	Bid Validity Period	90 days
9	Bid Security/ Earnest Money (Refundable)	Required in the amount of: 2% of the bid value of each item (separately) against which the bidder is participating. Acceptable Forms of Bid Security: Denominated in Pak Rupees duly issued by a Pakistani Bank or branch of a Foreign Bank, in the form of CDR in favor of the Treasurer, UET, Mardan. An affidavit, without disclosing the amount, stating that "The requisite Bid Security of 2% of the total bid has been placed separately in the sealed envelope of financial bid" on stamp paper shall be placed in the technical proposal. Whereas, 2% bid security in the shape of CDR shall be placed in the financial proposal.
10	Liquidated Damages	Will be imposed as percentage of contract price per day of delay: as referred in Draft Contract Sample in Annexure – II.
11	Performance Security	Within 20-days of issuance of Purchase Order and well prior to the signing of contract, as 10% of the contract value for the duration of Warranty period as referred.
12	Currency of Bid	Relevant Currency
13	Deadline for submitting requests for clarifications/ questions	5 days before the submission deadline.

14	Contact Details for submitting clarifications/ questions	Procurement Officer, UET, Mardan
15	Manner of Disseminating Supplemental Information to the ITB and responses/ clarifications to queries	Procurement Officer, UET, Mardan
16	Deadline for Submission	May 26, 2021 at 10:00 AM
17	Number of Set(s) of Bid	Bid Proposal(s) - One (01) Original - One (01) Copy Note: Bidders are required to prepare and submit the Proposal(s) against the individual item.
18	Allowable Manner of Submitting Bids	Courier/By hand delivery.
19	Bid Submission Address	Procurement Officer, Purchase Section, UET, Mardan:
20	Electronic submission (email) requirements	Not Allowed
21	Date, time and venue for opening of bid	Date and Time: 26th May, 2021, at 10:00 am Venue: Conference Room, UET Mardan
22	Evaluation Method	Eligible and qualified bids of bids as per technical and financial evaluation criteria as stipulated in this ITB.
23	Evaluation Method for the Award of Contract	As per the technical and financial evaluation mentioned in ITB 33 & 34, respectively.
24	Expected date for commencement of Contract	July, 2021
25	Maximum expected duration of Contract	16-weeks for importing lab equipment
26	UET, Mardan will award the contract to:	Bidder on individual item base.
27	Type and Contract Terms and conditions that will apply	General Terms and Conditions for Contracts for Goods and/ or Services as per Sample at Annexure – II.
28	Delivery, Installation and Testing/Training	16 Weeks for importing lab equipment

4. Evaluation Criteria

Preliminary Examination Criteria

Bids will be examined to determine whether they are complete and submitted in accordance with ITB Requirements as per below criteria on a Yes/ No basis:

- Appropriate signatures
- Power of Attorney
- Minimum Bid documents provided
- Bid Validity
- Bid Security submitted as per ITB requirements with compliant validity period

Minimum Eligibility Criteria

Eligibility will be evaluated on a Pass/ Fail basis as per ITB laid down criteria. If the Bid is submitted as a Joint Venture, there should be no more than two (02) companies in the Joint Venture and each company should meet the minimum criteria, unless otherwise specified.

Eligibility			
S #	**Subject**	**Criteria**	**Reference/Returnable Form(s)**
1.	Bidder's status	Participate as: ▪ Individual company ▪ JV/Consortium	Form B: Joint Venture/ consortium/association Information Form
2.	Legal Status	Bidder is a legally registered entity in Pakistan. Bidder is/ are also registered with FBR for Income Tax and Sales Tax	Form C: Bidder Information Form
3.	Location of Offices	Bidder (Lead Bidder) has either declared office(s) in Islamabad/ Rawalpindi/ Peshawar. Alternately, if the Contract is awarded, the Bidder may establish office in either of these cities (Optional).	Form C: Bidder Information Form
4.	Principal's Authorization	Bidder or at least one member of JV/ Consortium/ Association must be Authorized Partner/ Reseller/ Dealer for the supply and services of quoted goods/ services.	Form C: Bidder Information Form
5.	Company in Operation	Bidder (Lead Bidder) is in operation for at least Five (05) years.	Form C: Bidder Information Form
6.	Financial Strength	Average annual turnover over last 3 years no less than Rs. 10 million (For JV/ Consortium/ Association, all Parties cumulatively should meet requirement).	Form C: Bidder Information Form
7.	Relevant Experience	Minimum No. of Projects of similar nature, value, and complexity in last 3 years Two (02) projects (For JV/Consortium/Association, all Parties cumulatively should meet requirement).	Form C: Bidder Information Form
8.	Eligibility	Bidder(s) is not suspended, nor debarred, nor otherwise identified as ineligible by any Government/ Semi-government/ Autonomous	Form A: Bid Submission Form

		organization in Pakistan, in accordance with ITB clause. Non-Blacklisting certificate will be required.	
9.	Bankruptcy	Bidder(s) has not declared bankruptcy, is not involved in bankruptcy or receivership proceedings, and there is no judgment or pending legal action against the vendor that could impair its operations in the foreseeable future.	Form A: Bid Submission Form

5. Technical Specification of Equipment

1. Stress Analysis Lab				
S.No.	**Item**		**Specifications**	**Country of origin**
1.1	**Stress-opt icon (loading frame for photo elastic models)**		With various photo elastic models for demonstration of stress pattern Reflection Polari scope	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
1.2	**Reflection Polari scope**			USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
1.3	**Digital Oscilloscope**		**(**10 MHz), Two inputs channel Sampling rate 10 sample/u sec.	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
1.4	**Miscellaneous tools/equipment**			
	1.4.1	Computer system for data acquisition, analysis, storage, software operation and simulation	Core i7; 10th Generation; 8 GB RAM; 1 TB HD; 256 GB SSD; 24'' LED Display with keyboard, mouse, Wi-Fi Connectivity devices, and other accessories	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	1.4.2	Fire Extinguisher	ABC Dry Chemical, 5Kg	

2.	Hydraulic and Fluid Mechanic Lab		
S.No.	**Item**	**Specifications**	**Country of origin**
2.1	**Volumetric Hydraulic Bench**	Hydraulics bench built completely in stainless steel and mounted on wheels – Centrifugal pump of stainless steel - 0.37 kW, maximum flow rate of 80 Liter/min, maximum head of 20 m – Variable-area flow meter – Capacity of the supply tank: 120 liters – Upper tank for measuring volume flow: 10 liters, for low flow rates; 40 liters, for high flow rates – Control valve for adjusting flow rate – Discharge valve on the base of the upper tank for water recycling inside the supply tank – Open channel at the top with the function of supporting various modules	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand,
2.2	**Dead Weight Pressure Gauge Calibrator**	• Operation principles of a Bourdon tube gauge • Calibration of a Bourdon tube gauge • Calibration errors • Bourbon tube gauge: range 0 - 2.5 bar • AISI 304 stainless steel piston: 12 mm • Loads: 1 x 0.5 bar; 1 x 1 bar	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan

2.3	**Hydrostatic Pressure Apparatus**	• Determining the center of hydrostatic pressure on a surface submerged completely or partially and comprising with the theoretical position • Determining the resulting compression force by using counterbalance weights • Determining the compression force when the water level varies	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
2.4	**FLOW OVER WEIRS**	• Demonstration of flow over weirs features with rectangular opening. Demonstration of flow over weirs features with V opening. Calculation of discharge coefficient • Dimensions of weir plates: height: 160 mm; width of 200 mm Rectangular weir V" weir 60°, "V" weir 90° Trapezoidal weir or "Cipolletti" type weirs • Depth gauge, range: 0-300 mm resolution 0.05 mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
2.5	**Bernoulli's Theorem Demonstration Apparatus**	• AISI 304 Stainless steel structure • 7 tubes pressure gauge, range 0-500 mm • Diameter of Venturi tube: 20 mm • Venturi tube throat diameter: 10 mm • Upstream taper: 14°	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
2.6	**IMPACT OF A JET**	• Diameter of cylinder: 180 mm • Height of cylinder: 300 mm • 2 interchangeable nozzles diameter: 8 mm, 5 mm • Distance between nozzle and target: 20 mm • Diameter of target plate: 30 mm • Types of targets with different shape: -flat target, 45° cone, Hemispherical target, Set of weights	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan

2.7	**FLOW THROUGH ORIFICES**	• AISI 304 Stainless steel structure • Orifice diameters: 4 mm and 8 mm • Jet trajectory probes: 8, Height of overflow: 410 mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
2.8	**OSBORNE REYNOLDS' DEMONSTRATION**	• Head tank: 3,5 l • Diameter of the test pipe: 10 mm • Length of the test pipe: 700 mm • Dye reservoir capacity: 250 mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
2.9	**FREE AND FORCED VORTEX**	• Tank diameter: 250 mm Tank height: 300 mm • Orifice diameters: 8, 12, 16, 24 mm • Distance from center of vortex height measuring probes: 0, 30, 50, 70, 90 and 110 mm. • Pitot tubes at: 15, 25, 30 mm radius • Inlet tubes diameters: 9, 12.5 mm • Inlet tubes inclination: • 60° for diameter of 9 mm, 110 mm • 15° for diameter of 12.5 mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
2.10	**Pelton-wheel Turbine (Demonstration Model)**	Determining the operating characteristics (power, efficiency, torque) of a Pelton turbine at various speeds of its rotor • Output: 5W at 500 min-1, approx. 30L/min, H=2m • 14 blades: • Blade width: 33,5mm • External Ø: 132mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan

2.11	**Fluid Friction Apparatus** − Demonstrating the relationship between head losses and velocity of fluid – Determining the head loss of a flow through pipes of different diameters, fittings and metering devices − Determining the relationship between friction coefficients and Reynolds' number for flow through a pipe with roughened bore − Demonstrating the application of different systems for measuring flow rate and fluid velocity – Practical training of pressure measurement techniques.	• 4 smoothbore pipes of different diameters ranging from 4.5mm I.D. to 17.2mm I.D. • Artificially roughened pipe, • 90° bends (large & small radii) • 90° elbow, 90° miter • 45° elbow, 45° Y • 90° T, Sudden enlargement • Sudden contraction • Gate valve, Globe valve • Ball valve • Inline strainer • Perspex Venturi • Perspex orifice meter • Perspex pipe section with a Pitot tube & static tapping • 38 tapping points • Pressure: -1-1.5bar • Differential pressure: 1x 0…+/-350mbar • 8x 0…1000mmWS, Flow rate: 1x400…4000L/h	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
2.12	**Centrifugal Pump performance test apparatus** - Drawing of the curve H(Q) for a centrifugal pump - Plotting the curves of head, power, speed and efficiency versus flow rate - Series connection of two pumps with same characteristics - series connection of two pumps with different characteristics - Parallel connection of two pumps with same characteristics - Parallel connection of two pumps with different characteristics	• Centrifugal pumps with motors • power consumption: 370W each • Pump with variable speed: 0…3300min -1 • max. flow rate: 40L/min • max. head: 10m • Pump with fixed speed: approx. 2800min -1 • max. flow rate: 40L/min • max. head: 10m • Water tank: approx. 15L • Measuring ranges • pressure (inlet): -1 to 1 bar • pressure (outlet): 2x 0 to 5bar • flow rate: 10 to 140L/min.	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan

2.13	**Series and Parallel pump assembly** • Drawing of the curve H(Q) of a centrifugal pump • Series connection of two pumps with same characteristics • Parallel connection of two pumps with same characteristics		• Centrifugal pumps with motors • power consumption: 370W each • Pump with variable speed: 0-3300min -1 • max. flow rate: 40L/min • max. head: 10m • Pump with fixed speed: approx. 2800min -1 • max. flow rate: 40L/min • max. head: 10m • Water tank: approx. 15L • Measuring ranges • pressure (inlet): -1…1ba • pressure (outlet): 2x 0…5bar • flow rate: 10…140L/min	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
2.14	**Miscellaneous tools/equipment**			
	2.14.1	Flow meter measurement apparatus	Different methods of flow rate measurement • Venturi nozzle: A=84…338mm² • angle at the inlet: 10,5° • angle at the outlet: 4° • Orifice plate flow meter: diameter=14mm • Measuring nozzle: diameter=18,5mm • Rotameter: max. 1700L/h • 6 tube manometers: 390mmWC.	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
	2.14.2	Fire Extinguisher	ABC Dry Chemical, 5Kg	
	2.14.3	Computer system for data acquisition, analysis, storage, software operation and simulation	Core i7; 10th Generation; 8 GB RAM; 1 TB HD; 256 GB SSD; 24'' LED Display with keyboard, mouse, Wi-Fi Connectivity devices, and other accessories	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China

3. Production Automation Lab			
S.N	**Item**	**Specifications**	**Country of origin**

3.1	**FMS (Flexible Manufacturing System)**	Modular system Parts dispenser with one conveyor, Second conveyor controlled by serpent, Running two processes simultaneously, Fully automated work cell and table	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
3.2	**CNC Lathe**	Swing over bed: 250 mm X Axis travel: 200 mm Z Axis travel: 265 mm Distance between centres: 350 mm Swing over cross slide: 150 mm Maximum turning length:265 mm AC spindle motor: 1.5 kW Infinitely variable speeds:200 to 3200 rpm Spindle bored to pass: 35 mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan

3.3	**CNC Milling Machine**	Axis travel X (longitudinal) 225 mm Y (cross) 150 mm Z(vertical)140 mm Spindle to column: 130 mm Distance spindle to table 202 mm Table to column 5 to 130 mm Working Table area 410 x 130 mm 2 tee slots dimensions 2 x 10 mm x 100 mm centres Rapid traverse at 100% 2000mm/min Programmable feed rate 10 to 2000 mm /min Spindle speed range 350 to 3500 rpm (programmable & variable)	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
3.4	**CNC 3D CAM Center Lathe & Mill Tools with Computer Software & System**	Swing Over Bed 210mm X Axis Travel 150mm Z Axis Travel 350 mm Spindle Bored to Pass 25 mm Distance between centre 400 mm Spindle Motor 1100 Watts	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand,
3.5	**CNC Vertical Machining Center**	Axis Travel X - (longitudinal): 304 mm Y - (cross): 157 mm Z - (vertical): 213 mm Spindle to column: 155 mm Distance spindle to table: 47 - 260 mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan

3.6	**EDM Wire Cut**		Travel of working Table: 1 000 x 630mm Max cutting thickness: 300mm Max cutting taper degree: 3 degree Size of the Mo wire: 0.15-0.2mm Processing precision all directions: 0.03mm Taper degree: 0.05 mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
3.7	**Miscellaneous tools/equipment**			
	3.7.1	3D printer	• Build Volume 400 x 400 x 600 mm • Layer Resolution 100 to 300 Microns • Nozzle Diameter 0.4 mm • Filament Temperature 185 °C PLA • Filament Supports PLA, ABS, TPU • Filament Diameter 1.75 mm • Language English • Operating System Mac - Windows • Print & Slicing Software Simplify3D • Ambient Condition: Temp: 10-30 °C • Humidity: 20-50%	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
	3.7.2	Fire Extinguisher	ABC Dry Chemical, 5Kg	
	3.7.3	Computer system for data acquisition, analysis, storage, software operation and simulation	Core i7; 10th Generation; 8 GB RAM; 1 TB HD; 256 GB SSD; 24'' LED Display with keyboard, mouse, Wi-Fi Connectivity devices, and other accessories	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China

4. Power Plant Lab			
S.No	**Item**	**Specifications**	**Country of origin**

4.1	**Steam power plant with PC data Acquisition**	Laboratory scale steam power plant, Oil-heated instantaneous boiler 100kW, steam, output 120kg/h at 10bar, Electrical super heater 6Kw, Steam turbine 1.5kW at 3000rpm, vacuum or exhaust operation, Water-cooled condenser 9SkW System equipped with PC data acquisition Monitoring and control of the system using an integrated PLC Feed water treatment unit Detailed instruction manual In case of operation without cooling tower, 20m3/h cooling water connection necessary.	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
4.2	**Functional Turbojet (Cut Model)**	Demonstration / section model of turbo jet engine Showing the various stages of compressor turbine combustion chamber	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
4.3	**Twin Cylinder engine test bed Accessories**	Basic emission analyzer for HC,CO,C02,02 Lamda & AFR include sample probe Oil temperature & RPM inductive Pickups Analyzer stand A4 printer Spares Kit for twin cylinder engine test bed	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
4.4	**Four stroke Air cooled Sl Engine**	Experimental Table top model	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan

4.5	**Heat Pump (Mechanical)**		• Compressor – Hermetically sealed compressor using R-12 refrigerant, having capacity 0.3 tons of refrigeration. Condensing pressure – max. 15 Kg/cm2 (Actual pressures will depend upon working conditions). • Condenser – Shell and coil type with continuous water flow arrangement. • Evaporator – Shell and coil type with continuous water flow arrangement Expansion Valve – Internally equalized thermostatic expansion valve • Rotameter for condenser & evaporator water flow rate measurement. • Rotameter for liquid refrigerant flow measurement. • Pressure gauges for condensing and evaporating pressure – 2 Nos. • Thermometer for refrigeration cycle & water temp, measurement • Wattmeter for compressor input measurement. Ammeter for compressor current measurement. • Controls – • HP/LP cutout for compressor. • Overload protector for compressor. • Gate valve to control water flow rates. • Necessary switches and fuse.	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
4.6	**Miscellaneous**			
	4.6.1	Computer system for lab data acquisition, analysis, storage, software operation and simulation	Core i7; 10th Generation; 8 GB RAM; 1 TB HD; 256 GB SSD; 24'' LED Display with keyboard, mouse, Wi-Fi Connectivity devices, and other accessories	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China

5. Theory of Machine Lab			
S.No.	**Item**	**Specifications**	**Country of origin**
5.1	**Static and dynamic balancing apparatus**	Table unit for illustrating the fundamentals of static and dynamic balancing Speed range 0 to 1400 rpm, controlled Digital speed display	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
5.2	Universal Vibration System (with vibration sensor and PC aided data recording system) Instructional and experimental oscillation system, experiments on damping, resonance, two-weight system and oscillation quenching 6 pendulum oscillators, 2 bar-type oscillators, 1 spring-mass oscillator Electrical unbalance exciter 0 - 50Hz, 100cmg Electronic exciter control unit with digital frequency display and TTL output for triggering external units 5 - 50Hz, adjustable absorber with leaf spring Oil-filled damper 5-15Ns/m Rolling recorder, 20mm/s	*Specification* a) Beam, rigid: LxWxH: 700x25x12mm, 1,6kg b) Beam, elastic: LxWxH: 25x4x700mm, 0,6kg c) Tension-pressure springs 0,75N/mm 1,5N/mm 3,0N/mm d) Imbalance exciter 0…50Hz 100cmg e) Oil damper: 5…15Ns/m f) Absorber g) leaf spring: WxH: 20x1,5mm h) total mass: approx. 1,1kg i) tuneable: 5…50Hz j) Drum recorder: 20mm/s, width 100mm k) Polar chart recorder: Ø=100mm l) Complete unit with data acquisition capability for analyzing the experiments	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
5.3	**Screw jack apparatus**	Mechanical type for lifting of normal load.	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan

5.4	**Cam and roller apparatus**	a) 4 different shapes of cam: circular arc, tangent, hollow or asymmetric b) 3 different engaging members: roller plunger, flat plunger or cam follower c) cam and engaging member can be exchanged without tools d) dial gauge for determining the stroke e) angular scale for determining the angle of rotation f) Angular scale 0…360° g) graduation: 1° h) Dial gauge for the stroke 0…30mm i) Graduation: 0,01mm.	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
5.5	**Quick Return motion apparatus**	Measure: stroke on the cylinder, Crank disk anodized aluminum ball-bearing mounted, Crank radius 25mm 37,5mm 50mm Connecting rod anodized aluminum, Cylinder stroke 0…100mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
5.6	**Gyroscope apparatus**	• Rotor dia. 250mm free about 3 axis of rotation driven by variable speed motor. • Dimmer stat to control the motor speed. • Stopwatch to measure the angular speed about the axis of precession. • Weights – 0.2 kg, 0.5 kg and 1 kg..	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
5.7	**Geared system**	Geared system mechanism table top types.	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
5.8	**Whirling of Shaft apparatus**	Experimental type, Phase: Single Phase, Speed: 6000 rpm, Table Dimension: 1500 x300 x300 mm, Motor Power: 1/6 HP Number of Shaft of Different Diameter: 3	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan

5.9	**Equilibrium of forces apparatus**		a) experimental setup to demonstrate simple, planar force systems b) panel with rails around the edges for easy mounting of various experimental components panel with imprinted 50mm line grid and facility to write on using erasable marker c) lever rods with 50mm grid d) wide range of mountings: cables, rods, pulleys, torque disks, pivot bearings and the like force gauges for tensile and compressive forces, with large-format display transparent dial on force gauge rotatable Panel 1 WxH: 600x700mm, 13kg 2 line grid: 50mm 3 Force gauges for tensile and compressive force 4 measuring range: ±50N 5 display diameter: Ø=110mm 6 protected against overloading 7 Weights 8 2x 5N (hanger) 9 6x 5N	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
5.10	**Miscellaneous**			
	5.10.1	Computer system for data acquisition, analysis, storage, software operation and simulation	Core i7; 10th Generation; 8 GB RAM; 1 TB HD; 256 GB SSD; 24'' LED Display with keyboard, mouse, Wi-Fi Connectivity devices, and other accessories	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China

5.10.2	Torsional Vibration apparatus	• Five torsion bars aluminum • length: 1100mm • diameter: 2mm, 3mm, 4mm, 5mm, 6mm Circular ring • outer diameter: 160mm • inner diameter: 100mm • height: 31mm • Circular disk • diameter: 160mm • height: 19mm • 2 Stopwatch: 1/100s	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
5.10.3	Free and Damped Torsional Vibration	• Torsion bars: stainless steel • diameter: 3mm, 5mm, 6mm • length: 800mm • Mass disks • Small: D=150mm approx. 2,7kg • Large: D=228mm approx. 4,8kg	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
5.10.4	Four bar chain apparatus	• Drive disk and output disk anodized aluminum • ball-bearing mounted • Crank radius 25mm, 37,5mm, 50mm • Rocker aluminum, anodized black • oscillation radius: 50mm, 100mm, 200mm • Coupling aluminum, anodized black • length: 60mm, 160mm, 180mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
5.10.5	Oscillating Cylinder Mechanism	• Drive disk anodized aluminum • ball-bearing mounted • Crank radius: 46mm • Slider radius 55mm • Driving rod anodized aluminum • length: 145mm • Cylinder/driving rod/frame • Stroke: 0- 100mm.	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
5.10.6	Geneva Mechanism	• Tabletop mechanism	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan

	5.10.7	Clutch Plate Friction Apparatus	• 3 x Friction discs: Ø300, Ø200, Ø100mm diameters, 5mm thick • Turntable diameter: Ø250mm • Weights set: 6 x 0.1N, 8 x 0.2N, 2 x 1N; 4 x 2N; 2 x 5N; 2 x 10N; 2 x 20N; 2 x 50N; 1 x 100N; • 2 x Load hangers	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
	5.10.8	Belt Friction Apparatus	• Flat groove and 40° 'V' groove • 150mm effective groove diameter • Safety interlock to stop pulley rotating • Flat and V type belt set	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
	5.10.9	Wheel and Differential Axle	• Pulleys: Ø=250mm, 100mm, 50mm • Loose Roller: Ø=75mm • Weights: 2x 1N (hanger), 4x 0,5N, 4x 1N, 4x 2N, 4x 5N	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
	5.10.10	Compound Pendulum Apparatus	• Wall mounted apparatus	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan

6. Heat and Mass transfer Lab			
S.No.	**Item**	**Specifications**	**Country of origin**
6.1	**Free & force convection unit with PC based data acquisition**	a) Heating elements b) tube bundle: heating power 20W c) cylinder: heating power 20W d) plate: heating power 40W e) cylinder for circumferential measurement: f) heating power 40W g) Axial fan h) max. flow rate: 500m³/h i) nominal speed: 9500min-1 j) power consumption: 90W k) Measuring ranges air velocity: 0…10m/s temperature: 4x 0…325°C heating power: 0…50W.	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
6.2	**Thermal Conductivity Apparatus**	a) Heater b) heating power: 350W c) Annular gap d) height: 0,4mm e) average diameter: 29,6mm f) Inner cylinder g) mass: 0,11kg h) specific heat capacity: 890J/kg*K i) Measuring ranges temperature: 2x 0…325°C heating power: 0…450W.	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
6.3	**Emissivity Measuring Apparatus**	Experimental type. • Test and Black Plates 150 mm Dia • Digital Voltmeter: 0-230V • Digital Ammeter: 0-2 Amps • Wattmeter 400W	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan

6.4	**Double Pipe Heat Exchanger (Heat Exchanger Unit)**	Heat exchangers: • Concentric tube: 2 sections of stainless-steel inner tube with clear acrylic casing. • Shell and tube: Stainless steel inner tubes with clear acrylic casing. Plate: Stainless steel multiple plates. • Hot water tank and pump. • Heater: 3000 W: Temperatures: 14 ea. • Flow meters: Hot water and cold water. • Stainless steel jacketed vessel with coil and stirrer • Jacket heat transfer area approximately 600 cm^2 • Coil heat transfer area approximately 350 cm^2 • Stirrer: 0- 500 rpm: Measuring ranges: temperature: 2x 0…325°C Heating power: 0-3000W • Required for Operation: 230V, 50Hz, 1 phase; 230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
6.5	**Cross Flow Heat Exchanger**	Experimental type. • Heating power: 0-300W • Air duct: Flow cross-section: 120x120mm: Height: approx. 0,6m Heating elements, temperature limitation: 90°C	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
6.6	**Fins Performance Measuring Apparatus**	• Air duct: Flow cross-section: 120x120mm, Height: approx. 0,6m • Heating elements, temperature limitation: 90°C • Tube bundle • Number of tubes: 23 • Heating power: 20W • Heating power: 20W • Heat transfer area: 0.0112m^2 • Heating power: 40W • Cylinder with heating foil to investigate the local heat transfer • Heating power: 40W • Heat transfer area: 0.0112m2 • Axial fan • Max. Flow rate: 500m3/h Max. Pressure difference: approx. 950Pa • Power consumption: 90W	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan

6.7	**Stefan Boltzmann Apparatus**		• Range: 0.55 to 18 m • Size: 8 x 7.2 x 4 cm • Accuracy: 0.5% (+1 digit) with Area and Volume Calculation • Back light Range 3 to 60 ft. (0.91 to 18.288 m) • Frequency 40 kHz • Power Supply 12V • Unit of Measurement, Feet/Meters • Working Temperature: 0-50 degree C	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
6.8	**Miscellaneous**			
	6.8.1	Flow boiling Demonstration	• Heater: power rating: 2kW: temperature range: 5…80°C • Heating and cooling medium: water • Pump: 3 stages • Max. Flow rate: 1,9m³/h: max. head: 1,5m • power consumption: 58W • Tube evaporator • length: 1050mm: inner diameter: 16mm • outer diameter: 24mm • Condenser: coiled tube made of copper • Measuring ranges pressure: -1…1,5bar relative • Temperature: 0…100°C.	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
	6.8.2	Boiling Heat Transfer Apparatus	• Heater • power: 250W, continuously adjustable • Safety valve: 2bar rel. • Pressure vessel: 2850mL • Condenser: coiled tube made of copper • Measuring ranges • tank pressure: 0…4bar abs. • power of heater: 0…300W • flow rate (cooling water): 0,05…1,8L/min • temperature: 4x 0…100°C	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan

	6.8.3	Computer system for data acquisition, analysis, storage, software operation and simulation	Core i7; 10th Generation; 8 GB RAM; 1 TB HD; 256 GB SSD; 24'' LED Display with keyboard, mouse, Wi-Fi Connectivity devices, and other accessories	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	6.8.4	Fire extinguisher	ABC Dry Chemical 5kg	

7. Thermodynamics Lab				
S.No.	**Item**		**Specifications**	**Country of origin**
7.1	**Saybolt Visco Meter**		Test meter: Approx. Product Dimensions: 29 x 25 x 33in (737 x 635 x 84mm), WxDxH	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
7.2	**Subsonic wind tunnel working**		section (15" x 15" x 30")	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
7.3	Miscellaneous tools/equipment			
	7.3.1	Coulomb's Law Apparatus	• Torsion Balance Assembly: Approx. 40 mm dia. Conductive sphere on 12 cm rod • Torsion balance wire: 10-6 Newtons/Degree • Charging Prob: 17 cm long plus 1.5 m cable; banana plug connector; 200μΩ internal resistance • Calibration masses: 50 mg (1), 20 mg (2)	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
	7.3.2	Combination square		USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	7.3.3	Depth gauge	200mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	7.3.4	Depth micrometer	0-75mm	USA, UK, European union, Germany,France, Spain, Poland, Italy ,Thailand, Japan, China
	7.3.5	Dial depth gauge	150 mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China

	7.3.6	Dial indicator		USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	7.3.7	Oil hand pump		USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	7.3.8	Computer system for data acquisition, analysis, storage, software operation and simulation	Core i7; 10th Generation; 8 GB RAM; 1 TB HD; 256 GB SSD; 24'' LED Display with keyboard, mouse, Wi-Fi Connectivity devices, and other accessories	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China

8. Refrigeration & Air-Conditioning Lab			
S.No.	**Item**	**Specifications**	**Country of origin**
8.1	**General Air-Conditioning Trainer**	Multi-color silk screen panel with 16 signaling lamps, psychometric chart and switches, mounted on a painted and baked steel structure Transparent air flow circuit (with diffusers) and "ambient chamber" Cooling and dehumidification battery with eight ranks consisting in: refrigerant circuit with 865W-compressor, forced-air condenser, water exchanger and regulation and safety devices; proportional regulation Vapor humidification battery with automatic power supply and proportional regulation	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
8.2	**Compression Refrigeration Cycle**	Steel structure painted with epoxy paint and baked Hermetic condensing unit 64-W nominal hermetic compressor, LBP/LST-type Thermometric protector RSCR electrical motor Double safety pressure switch against low and high pressures Water condenser made with glass vase and copper duct S = 0.117 m2	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan

8.3	**Freezing Trainer**	Painted, baked and finished steel structure • 200-W hermetic compressor; 17 cc • Forced air and variable flow condenser • 2 refrigerant cells with thermostat and thermometric probes; the first with plate evaporator, the second with forced ventilation vaporator • Temperature recording instrument at the product core	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
8.4	**Cutaway Model Hermetic Refrigerant Compressor**	• Colour synoptic diagram, with signaling lamps, mounted on steel, painted and baked structure • Copper refrigeration circuit with connected and operating components • 300x200x240mm, 12kg • Compressor: 255x151x209mm, 9kg • 1-cylinder refrigerant compressor • Electrical power: 510W • Refrigerating capacity: 723W	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
8.5	**Refrigeration Charging and Evacuation System**	Colour synoptic diagram, with signaling lamps. 400-W hermetic compressor • Forced air and variable flow condenser • 2 independent evaporator refrigeration cells • Thermostatic regulation valves and barostatic relief valve • ON-OFF temperature regulation with E.L.C.B. that can be calibrated • Sub-cooling refrigeration liquid exchanger	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
8.6	Miscellaneous tools/equipment		
	8.6.1	a. Vernier Calipers b. Dead weight calibrator c. Micrometer d. Bore gauge e. Vernier bevel Protector f. Transducer & Instrumentation	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan

	8.6.2	Computer system for data acquisition, analysis, storage, software operation and simulation	Core i7; 10th Generation; 8 GB RAM; 1 TB HD; 256 GB SSD; 24'' LED Display with keyboard, mouse, Wi-Fi Connectivity devices, and other accessories	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
9. Solid Mechanics Lab				
S.No.	**Item**		**Specifications**	**Country of origin**
9.1	**Torsion of Bars Apparatus**		a) elastic deformation of bars under bending or torsion b) bending tests with statically determinate and indeterminate systems c) torsion tests with a statically determinate system d) supports in the bending test may be clamped or free e) 2 adjustable blocks with clamping chuck for torsion tests and supports for bending tests f) weights to generate the bending or twisting moment	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan

		g) dial gauge with bracket h) storage system to house the components **17 bars for bending tests** a) material: aluminum, steel, brass, copper b) height with LxW 510x20mm: h=3…10mm c) width with LxH 510x5mm: w=10…30mm d) length with WxH 20x4mm: l=210…510mm e) LxWxH: 20x4x510mm (Al, St, brass, Cu) f) LxWxH: 10x10x510mm (aluminium) **22 torsion bars** a) material: aluminium, steel, brass, copper b) length with Ø=10mm: 50…640mm (aluminium)	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
9.2	**Universal Testing Machine**	Load cell: 100kN with PC output	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan

9.3	**Miscellaneous tools/equipment**			
	9.3.1	Vernier Caliper, Analog	• Measuring Range: 0-300mm Resolution: 0.05	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
	9.3.2	Vernier Caliper, Digital	• Measuring Range: 0-200mm • Resolution: 0.01 • Depth bar: Yes	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
	9.3.3	Screw Gauge, Analog	• Measurement Range: 0-25mm Resolution: 0.01	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
	9.3.4	Screw Gauge, Digital	• Measurement Range: 0-25mm • Accuracy: ±0.002 mm • Resolution: 0.001mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan

	9.3.5	Hook Law Apparatus	• Type of on-board meter available • Casing Material: Glass • Rigid support • Hanger set • Slotted weights • Hook, fine pointer, vertical wooden scale	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
	9.3.6	Optical Bench	• Length: 1.2 meter • Sliding rail • 12V-24W universal holders for lenses • 50×50mm slides, 50×50 triangular object, 2 pin objects • Diffuser screen • Concentric circles (10 mm& 20 mm) • Flashlight	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
	9.3.7	Bi-Convex Lens	• Lens Diameter: 50mm • Focal Lengths: +250mm &-150mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
	9.3.8	Newton Rings Apparatus	• Plano-convex Lens • Wavelength Range: 350 nm-2 µm • Focal Lengths Available 4-2500 mm • Index of refraction: 1.515 • Spherometer • Dia of test part:5 mm to 200 mm • Measuring force: 06N Dimensions: 200mm dia ×300mm height • Optically flat glass plate incline at 45 degree	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan
	9.3.9	Vertical Vernier Caliper	• Digital • Scale Adjustment: 8mm • Accuracy: ±0.04 or ±0.06 • Resolution: 0.01mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China

	9.3.10	Computer system for data acquisition, analysis, storage, software operation and simulation	Core i7; 10th Generation; 8 GB RAM; 1 TB HD; 256 GB SSD; 24'' LED Display with keyboard, mouse, Wi-Fi Connectivity devices, and other accessories	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China

10. Workshop Technology Lab			
S.No.	**Item**	**Specification**	**Country of origin**
10.1	**Pattern Shop** a. Pedestal Grinding Wheel b. Pattern Milling Machine c. Lathe Machine for Wood d. Drill Machine Pillar Type e. Circular Saw Machine f. Planner Machine for wood g. Complete set of relevant tools	a. Pedestal Grinding Wheel • Power Consumption: 1.5 KW. • No Load Speed: 2800 RPM. • Disc Diameter: 12 inches b. Pattern Milling Machine • Longitudinal (Table) 1400 mm • Cross (Table) 900 mm • Vertical (Head)l 700 mm • Circular Movement of Table 360° • Swivel of Milling Head on either side 45° Spindle Power 2.5 / 3 kw c. Lathe Machine for Wood • Max turning dia 8", bed length 6ft d. Drill Machine Pillar Type	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China

		• 1.5 HP, 2800 rpm, 35 mm M.S capacity vertical movement of worktable 800 mm, pulley drive. Set of relevant tools e. Circular Saw Machine • Max cutter dia 12” • Table size 660x560 mm, 1hp motor f. Planner Machine for Wood • Table size 900x300 mm • 2 hp motor, spindle speed 6000 rpm g. Woodshop/pattern tools • Complete set of relevant tools	
10.2	**Elementary Machine Shop** a. Lathe Machine, Maximum turning dia 6", distance between centres 20" b. Drill Machine Piller type c. Pedestal Grinding Machine d. Complete set of relevant tools	a. Lathe Machine • Max turning dia 6”, bed length 6ft b. Drill Machine Pillar Type • 1.5 HP, 2800 rpm, 35 mm M.S capacity vertical movement of worktable 800 mm, pulley drive • Complete set of relevant tools c. Pedestal Grinding Wheel • Power Consumption: 1.5 KW. • No Load Speed: 2800 RPM. • Disc Diameter: 12 inch d. Complete set of relevant tools	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China

10.3	**Advance Machine Shop** a. Grinding Machine b. Drilling Machine c. Complete set of relevant tools	a. Pedestal Grinding Wheel • Power Consumption: 1.5 KW. • No Load Speed: 2800 RPM. • Disc Diameter: 12 inch b. Drilling Machine Pillar Type • 1.5 HP, 2800 rpm, 35 mm M.S capacity vertical movement of worktable 800 mm, pulley drive with set of relevant tools c. Complete set of relevant tools	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
10.4	**Smith Shop** a. Power Hammer b. Power Hack Saw c. Blower d. Smith Furnace e. Complete set of relevant tools	a. Weight of falling parts 16 kg, Hit number 250/min, power 1.5 KW, Max square job to be forged 20x20mm,max round job to be forged dia 20 mm b. 12” Stroke c. 1/4 to 1/3 HP blower motor. 850 – 1000 CFM d. 50 kg capacity for ferrous and non-ferrous with tilting mechanism core less type e. Complete set of relevant tools	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
10.5	**Foundry Shop** a. Sand Ramming Machine b. Crucible for cast iron, capacity 5 kg c. Complete set of relevant tools	a. With Sliding Weight, Lifting and Ramming Cam, Specimen Tube, Pedestal Cup and Stripper b. capacity 5 kg c. One complete set	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China

10.6	**Welding Shop** a. Welding Plant 50-400 Amp b. Welding Plant Single Phase 50-300 Amp c. Spot Welding Machine d. Electric Soldering Iron e. Complete set of relevant tools	a. 50-400 Amp b. 50-300 Amp c. 15 KVA, 7500 output current maximum electrode force 180 kg throat dimension 300 mm depth and 150 mm opening maximum material thickness 1.5+1.5 tip diameter 16 d. Bit Size 3.0 mm Chisel; Temperature 410ºC Power,30 Watts e. Complete set of relevant Tools	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
10.7	**Fitting Shop** a. Drilling Machine Pillar Type b. Grinding Machine c. Complete set of relevant hand tools	a. 1.5 HP, 2800 rpm, 35 mm M.S capacity vertical movement of worktable 800 mm, pulley drive with set of relevant tools b. 1.5 HP, 2800 rpm, 35 mm M.S capacity vertical movement of worktable 800 mm, pulley drive c. Complete set of relevant tools	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
10.8	**Miscellaneous**		
	10.8.1 Adjustable wrench	12”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.2 Adjustable wrench	8”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.3 Allen key set		USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China

	10.8.4	Hand grinder machine	4”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.5	Ball peen hammer	2 lbs.	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.6	Bench vice	5”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.7	Bench vice	6”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.8	Box spanner set	52 pcs.	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.9	Buffing wheel Cotton		USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.10	C clamp	6”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.11	Chisel set		USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.12	Chipping hammer		USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.13	Drill bits set		USA, UK, European union, Germany, France, Spain,

				Poland, Italy ,Thailand, Japan, China
	10.8.14	File flat bastered	10”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.15	File flat smooth	10”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.16	File half round bastered	10”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.17	File half round bastered	6”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.18	File half round bastered	8”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.19	File half round smooth	10”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.20	File knife edge	6”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.21	File round	10”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.22	File round	12”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China

	10.8.23	File round	8”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.24	File square bastered	8”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.25	File square smooth	8”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.26	Hammer	10 lbs	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.27	Hammer	15 lbs	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.28	Screwdriver set (champion)		USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.29	Scriber		USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.30	Spirit level	12”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.31	Universal vice	5”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.32	Vernier caliper	0-150mm	USA, UK, European union, Germany, France, Spain,

				Poland, Italy ,Thailand, Japan, China
	10.8.33	Vernier caliper	0-200mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.34	Vernier caliper	0-300mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.35	Vernier caliper dial	0-150mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.36	Vernier caliper dial	0-200mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.37	Hand Wood saw	14”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.38	Hand Wood saw	18”	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.39	Word punch	2mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.40	Word punch	3mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.41	Word punch	5mm	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China

	10.8.42	Surface Plates	Lab grade AA, 40 + Diagonal Squared / 25 (unilateral)	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China
	10.8.43	Computer system for data acquisition, analysis, storage, software operation and simulation	Core i7; 10th Generation; 8 GB RAM; 1 TB HD; 256 GB SSD; 24'' LED Display with keyboard, mouse, Wi-Fi Connectivity devices, and other accessories	USA, UK, European union, Germany, France, Spain, Poland, Italy ,Thailand, Japan, China

6. Special Terms and Conditions

Standard

1. The goods supplied must be capable of functioning properly under the climatic conditions of the area.
2. There shall be no deviation from specification and country of make as provided with each item. In case of any ambiguity in specification/ accessories needed for the full functioning of the equipment, the firm must clear it with the Procurement Committee. However, the decision of the Procurement Committee will be final.
3. The goods with standard accessories supplied under this tender shall confirm to the standard maintenance in the technical specification.

Training

1. The firm supplying the item/ equipment(s) will demonstrate the operation/ working of the supplied goods to the satisfaction of UET, Mardan and provide training. Suppliers are advised to provide details on formal training for covering all aspects.

Calibration of item/equipment

2. The supplier will install the good(s) in the presence and to the satisfaction of the Procurement Committee, if need be. In case of any defect in the supplied good(s) or if it is not in accordance with the desired specification(s), the goods will be changed at the cost of the supplier.

Warranty/ Guarantee

3. The Supplier will give comprehensive onsite warranty/ guarantee that the goods/ stores/ articles would continue to conform to the description and quality as specified for a period of at least One(01) year from the date of delivery, installation and commissioning of the said goods/ stores/ articles to be purchased and that notwithstanding the fact that the purchaser may have inspected and/ or approved the said goods/ stores/ article, if during the aforesaid period, the said goods/ stores/ articles, be discovered not to conform to the description and quality aforesaid or have determined (and the decision of the Procurement Committee in that context will be final and conclusive), the UET, Mardan will be entitled to reject the said goods/ stores/ articles or such portion thereof as may be discovered not to conform to the said description and quality, on such rejection the goods/ articles/ stores will be at the supplier's risk and all the provisions relating to rejection of goods etc. shall apply.
4. The Supplier shall, if so called upon to do, replace the goods etc., or such portion thereof as is rejected by Procurement Committee, otherwise the supplier shall pay such damage as may arise by the reason of the breach of the condition herein contained. Nothing herein contained shall prejudice any other right of the Procurement Committee in that behalf under this contract or otherwise.
5. The Supplier shall also replace equipment, in case it is found defective which cannot be put to operation due to manufacturing defect, etc. In case of equipment specified by the Procurement Committee, the supplier shall be responsible from carrying out annual

maintenance and repairs on the terms and conditions as may be agreed. The supplier shall also be responsible to ensure adequate regular supply of spare parts needed for a specific type of equipment whether under their annual maintenance and repairs contract or otherwise. In case of change of model, supplier will give sufficient notice to the Procurement Committee who may like to purchase spare parts from them to maintain the equipment in perfect condition.

7. Returnable Bidding Forms/Checklist

This section serves as a checklist for preparation of your Bid. Please complete the Returnable Bidding Forms in accordance with the instructions in the forms and return them as part of your Bid submission. No alteration to format of forms shall be permitted and no substitution shall be accepted. Before submitting your Bid, please ensure compliance with the Bid Submission instructions of the BDS. Bid Proposal:

Have you duly completed all the Returnable Bidding Forms?	
Form A: Bid Submission Form	1.
Form B: Joint Venture/Consortium/ Association Information Form	2.
Form C: Bidder Information Form	3.
Form D: Qualification Form	4.
Form E: Bid Proposal Form	5.
Form F: Specifications Compliance Form	6.
Form G: Price Schedule Form	7.
Have you provided the required documents to establish compliance with the evaluation criteria in Section 4?	8.

Form A: Bid Submission Form

(To be submitted in an envelope duly sealed and marked as Technical Proposal)

Name of the Bidder:		Date:
ITB reference:		

We, the undersigned, submit our Bid for the award of contract to supply the goods and related services required for [Insert Title of goods and services] in accordance with your Invitation to Bid No. [Insert ITB Reference Number]. We hereby submit our Bid, which includes this Bid proposal. We hereby declare that our firm, its affiliates or subsidiaries or employees, including any JV/ Consortium/ Association members or subcontractors or suppliers for any part of the contract:

- is not under procurement prohibition by any of the Government/ Semi-government/ Autonomous Organization;
- have not been suspended, debarred, sanctioned or otherwise identified as ineligible by any Organization in Pakistan;
- have not declared bankruptcy, are not involved in bankruptcy or receivership proceedings, and there is no judgment or pending legal action against us that could impair our operations in the foreseeable future;
- undertake not to engage in proscribed practices, including but not limited to corruption, fraud, coercion, collusion, obstruction, or any other unethical practice, with the UET, Mardan, and to conduct business in a manner that averts any financial, operational, reputational or other undue risk to the UET, Mardan.

We declare that all the information and statements made in this Bid are true and we accept that any misinterpretation or misrepresentation contained in this Bid may lead to our disqualification and/ or sanctioning by the UET, Mardan.

We offer to supply the goods and related services in conformity with the Bidding documents, including the UET, Mardan General Conditions of Contract and in accordance with the Schedule of Requirements and Specifications. Our Bid shall be valid and remain binding upon us for the period specified in the Bid Data Sheet. We understand and recognize that you are not bound to accept any Bid you receive.

I, the undersigned, certify that I am duly authorized by [Insert Name of Bidder] to sign and submit this Bid on behalf of bidder to UET, Mardan.

Name: _____
Title: _____
Date: _____
Signature: _____
[*Stamp with official stamp of the Bidder*]

Form B: Joint Venture/ Consortium/ Association Information Form

(To be submitted in an envelope duly sealed and marked as Technical Proposal)

Name of the Bidder:		Date:
ITB reference:		

To be completed and returned with your Bid if the Bid is submitted as a Joint Venture/Consortium/Association.

No.	Name of Partner and contact information (address, telephone numbers, fax numbers, e-mail address)	Proposed proportion of responsibilities (in %) and type of goods and/or services to be performed
1	[Complete]	[Complete]
2	[Complete]	[Complete]
3	[Complete]	[Complete]

Name of leading partner (with authority to bind the JV, Consortium, Association during the ITB process and, in the event a Contract is	[Complete]

We have attached a copy of the below referenced document signed by every partner, which details the likely legal structure of and the confirmation of joint and severable liability of the members of the said joint venture:

☐ Letter of intent to form a joint venture OR ☐ JV/Consortium/Association agreement

We hereby confirm that if the contract is awarded, all parties of the Joint Venture/Consortium/Association shall be jointly and severally liable to UET, Mardan for the fulfillment of the provisions of the Contract.

Name of partner: _____ Name of partner:_____

Signature: _____ Signature: _____

Date: _____ Date: _____

Name of partner: _____ Name of partner: _____

Signature: _____ Signature: _____

Date: _____ Date: _____

Form C: Bidder Information Form

(To be submitted in an envelope duly sealed and marked as Technical Proposal)

Legal name of Bidder	[Complete]
Legal address & Branch Offices	[Complete]
Year of registration	[Complete]
Bidder's Authorized Representative Information	Name and Title: [Complete] Telephone numbers: [Complete] Email: [Complete]
Countries of operation	
No. of full-time employees	
No. of Technical Staff	
Quality Assurance Certification (e.g. SO 9000 or Equivalent) *(If yes, provide a Copy of the valid Certificate):*	[Complete]
Does your Company hold any accreditation such as ISO 14001 or ISO 14064 or equivalent related to the environment? *(If yes, provide a Copy of the valid Certificate):*	[Complete]
Does your Company have a written Statement of its Environmental Policy? *(If yes, provide a Copy)*	[Complete]
Does your organization demonstrates significant commitment to sustainability through some other means, for example internal company policy documents on women empowerment, renewable energies, education, vocational trainings ,social responsibility towards people with Special needs, or membership of trade institutions promoting such issues	[Complete]
Contact person that UET, Mardan may contact for clarifications during bid evaluation	Name and Title: [Complete] Telephone numbers: [Complete] Email: [Complete]
Please attach the following documents:	• Company Profile, which should not exceed fifteen (15)

	pages, including printed brochures and product catalogues relevant to the goods and/ or services being procured.
	• Proposed timetable for delivery, installation and commissioning plan for the required and quoted items to UET, Mardan after the award of Contract.
	• Certificate of Registration of the business.
	• Principal's Authorization Letter in favor of Bidder to participate in this Tender.
	• A proofing document confirms the offered warranty for at least One (01) year, supported by the manufacturer's certificates, if applicable.
	• A proofing document confirming supply of same or similar items of this magnitude to various clients/ customers in Pakistan.
	• Proven records of no less than the required Projects of similar nature/ value/ complexity in which delivery and services were extended.
	• Full detailed description of the specifications of the proposed items in addition to catalogues clearly showing the proposed specifications responding to the requirements.
	• Supporting photos of the proposed items, if applicable.
	• Quality certifications: ISO 9001:2015 (if applicable)
	• Latest Audited Financial Statements (Income Statement and Balance Sheet) including Auditor's Report for the past (3 years).

Note: To be filled in by each partner in case Bid is submitted as a JV/ Consortium/ Association

Form D: Qualification Form

(To be submitted in an envelope duly sealed and marked as Technical Proposal)

Name of the Bidder:		Date:
ITB reference:		

If JV/ Consortium/ Association, to be completed by each partner.

Previous Relevant Experience

Please list all Projects successfully completed in the last 3 years, covering following aspects;
a) Scope of the projects/ assignments.
b) Activities performed for the successful completion of the project.
c) Support Services Contracts in hand with SLA for the supplied goods.

List only those assignments for which the Bidder was legally contracted or sub-contracted by the Client as a company or was one of the Consortium/ JV partners. Assignments completed by the Bidder's individual experts working privately or through other firms cannot be claimed as the relevant experience of the Bidder, or that of the Bidder's partners or sub-consultants, but can be claimed by the Experts themselves in their CVs. The Bidder should be prepared to substantiate the claimed experience by presenting copies of relevant documents and references if so requested by UET, Mardan.

Project name & Country of Assignment	Client & Reference Contact Details	Contract Value	Period of activity and status	Types of activities undertaken

Bidders may also attach their own Project Data Sheets with more details for assignments above.

History of Non-Performing Contracts

☐ Non-performing contracts did not occur during the last 3 years			
☐ Contract(s) not performed in the last 3 years			
Year	Non- performed portion of contract	Contract Identification	Total Contract Amount (current value in PKR)
		Name of Client: Address of Client: Reason(s) for non-performance:	

Financial Standing

Annual Turnover for the last 3 years		Year PKR Year PKR Year PKR	
Latest Credit Rating (if any), indicate the source			
Financial information (in PKR equivalent)	Historic information for the last 3 years		
	Year 1	Year 2	Year 3
	Information from Balance Sheet		
Total Assets (TA)			
Total Liabilities (TL)			
Current Assets (CA)			
Current Liabilities (CL)			
	Information from Balance Sheet		
Total / Gross Revenue (TR)			
Profits Before Taxes (PBT)			
Net Profit			
Current Ratio			

☐ Attached are copies of the audited financial statements (balance sheets, including all related notes, and income statements) for the years required above complying with the following condition:

a) Must reflect the financial situation of the Bidder or party to a JV, and not sister or parent companies;

b) Historic financial statements must be audited by a certified auditing firm;

c) Historic financial statements must correspond to accounting periods already completed and audited. No statements for partial periods shall be accepted.

Form E: Technical Bid Proposal Form

(To be submitted in an envelope duly sealed and marked as Technical Proposal)

Name of the Bidder:		Date:
ITB reference:		

The Bidder's Bid should be organized to follow this format of the Technical Bid Proposal. Where the bidder is presented with a requirement or asked to use a specific approach, the bidder must not only state its acceptance, but also describe how it intends to comply with the requirements. Where a descriptive response is requested, failure to provide the same may be viewed as non-responsive.

SECTION 1: Qualification, capacity and expertise

- Bidder's general organizational capability: management structure, financial stability and project financing capacity, project management controls, extent of work to be subcontracted (if so, provide details).
- Bidder's relevance of specialized knowledge and experience on similar engagements done in the region/ country. Bidder should submit a detailed description of the projects executed (quantities, value, beneficiary).
- Manufacturer's strengths covering the regional/ global market presence, hi-tech products portfolio, manufacturing capacity, R&D activities resulting in national and international patents, quality control and assurance practices, and international certifications in relevant areas.

SECTION 2: Management Structure and Key Personnel

2.1 Describe the overall management approach toward planning and implementing the project. Include an organization chart for the management of project describing relationship of key positions and designations.

2.2 Provide CVs for key personnel that will be provided to support the implementation of this project using the format below. CVs should demonstrate qualifications in areas relevant to scope of goods and/or services.

Format for CV of Proposed Key Personnel

Name of Personnel	[Insert]
Position	[Insert]
Nationality	[Insert]
Language proficiency	[Insert]
Education/ Qualifications	Summarize college/university and other specialized education of personnel member, giving names of schools, dates attended, and degrees/qualifications obtained.]
	[Insert]
Professional	Provide details of professional certifications relevant to the scope of goods and/or services]

certifications	▯ Name of institution: [Insert] ▯ Date of certification: [Insert]
Employment Record/ Experience	/List all positions held by personnel (starting with present position, list in reverse order), giving dates, names of employing organization, title of position and location of employment.
	[Insert]

I, the undersigned, certify that to the best of my knowledge and belief, the data provided above correctly describes my qualifications, my experiences, and other relevant information about myself.

_____ _____

Signature of Personnel Date (Day/Month/Year)

SECTION 3 : Scope of Supply, Technical Specifications and Training(s)

This section should demonstrate the Bidder's responsiveness to the specification by identifying the specific components proposed, addressing the requirements, as specified, point by point; providing a detailed description of the essential performance characteristics proposed; and demonstrating how the proposed bid meets or exceeds the requirements/specifications. All important aspects should be addressed in sufficient detail.

1.1 A detailed description of how the Bidder will deliver the required goods and services, keeping in mind the appropriateness to local conditions and project environment. Details how the different service elements shall be organized, controlled and delivered.

1.2 Explain whether any work would be subcontracted, to whom, how much percentage of the requirements, the rationale for such, and the roles of the proposed sub-contractors and how everyone will function as a team.

1.3 Implementation plan including a Gantt Chart or Project Schedule indicating the detailed sequence of activities that will be undertaken and their corresponding timing.

1.4 Details on post-deployment trainings on-site hands-on training for all equipment.

SECTION 4: Registration & Certifications

This section should demonstrate the Bidder's responsiveness towards its registration with the relevant national body and international organizations certifying the bidder's qualifications with respect to Quality and Project Management.

4.1 Provide a copy of valid registration with the relevant govt Authority.

4.2 Provide a copy of valid Certificate issued by International Organization for Standardization certifying the bidder's compliance and practices towards quality management principles and standards in their offered products/ solutions and services.

4.4 Provide a copy of valid Certificate issued by International Organization for Standardization certifying the bidder's compliance and practices towards information security management principles and standards in their offered products/ solutions and services.

SECTION 5: Warranty and Support Services

This section should demonstrate the Bidder's responsiveness to the post-commissioning warranty and support services of the goods supplied, addressing the requirements, as specified, point by point; providing a detailed description of the essential performance characteristics proposed; and

demonstrating how the proposed bid meets or exceeds the requirements. All important aspects should be addressed in sufficient detail.

5.1 A detailed description of how the Bidder will provide the Warranty claims to the users, keeping in mind the span and complexity of the project in context of local conditions and project environment.

5.2 Details how the post-delivery/ deployment Support Services will be provided to the users keeping in consideration the criticality of systems, and dependency of university administration and operations on such systems.

Form F: Specifications Compliance Form

(To be submitted in an envelope duly sealed and marked as Technical Proposal)

Name of the Bidder:		Date:
ITB reference:		

The Bidder's Bid should be organized to follow this format of the Technical Bid Proposal. Where the bidder is presented with a requirement or asked to use a specific approach, the bidder must not only state its acceptance, but also describe how it intends to comply with the requirements. Where a descriptive response is requested, failure to provide the same may be viewed as non-responsive.

Goods and services to be Supplied (based on the Technical Specifications provided in Section 5)		**Comply (Yes/ No) (If No, indicate discrepa**	**Quoted Specifications**	**Type/Model no. & Country of Origin Required**
Required Items		**Offered Items**		
1. STRESS ANALYSIS LAB				
1.1	**Stress-opt icon (loading frame for photo elastic models)**			
1.2	**Reflection Polari scope**			
1.3	**Digital Oscilloscope**			
1.4	**Miscellaneous:**			
1.4.1	Computer system for data acquisition, analysis, storage, software operation and simulation			
1.4.2	Fire Extinguisher: ABC Dry Chemical, 5Kg			

2. HYDRAULICS & FLUID MECHANICS LAB				
2.1	**Volumetric Hydraulic Bench.**			
2.2	**Dead Weight Pressure Gauge Calibrator**			
2.3	**Hydrostatic Pressure Apparatus**			
2.4	**FLOW OVER WEIRS**			
2.5	**Bernoulli's Theorem Demonstration Apparatus**			

2. HYDRAULICS & FLUID MECHANICS LAB				
2.6	**IMPACT OF A JET**			
2.7	**FLOW THROUGH ORIFICES**			
2.8	**OSBORNE REYNOLDS' DEMONSTRATION**			
2.9	**FREE AND FORCED VORTEX**			
2.10	**Pelton Turbine (Demonstration Model)**			
2.11	**Fluid Friction Apparatus**			
2.12	**Centrifugal Pump performance test apparatus**			
2.13	**Series and Parallel pump assembly**			
2.14	**Miscellaneous Tools**			
2.14.1	FLOW METER MEASUREMENT APPARATUS:			
2.14.2	FIRE EXTINGUISHER			
2.14.3	Computer system for data acquisition, analysis, storage, software operation and simulation			

3. Production Automation Lab				
3.1	**FMS (Flexible Manufacturing System)**			
3.2	**CNC Vertical Machining Center**			
3.3	**EDM Wire Cut**			
3.4	**CNC Lathe**			
3.5	**CNC Milling Machine**			
3.6	**CNC 3D CAM Center Lath & Mill Tools with Computer Software & System**			
3.7	**Miscellaneous**			
3.7.1	3D printer			
3.7.2	Fire Extinguisher ABC Dry Chemical, 5Kg			
3.7.3	Computer system for data acquisition, analysis, storage, software operation and simulation			

4. Power Plant Lab				
4.1	**Steam power plant with PC data Acquisition**			
4.2	**Functional Turbojet (Cut Model)**			
4.3	**Twin Cylinder engine test bed**			
4.4	**Four stroke Air cooled Sl Engine**			
4.5	**Heat Pump (Mechanical)**			
4.6	**Miscellaneous**			
4.6.1	Computer system for data acquisition, analysis, storage, software operation and simulation			

5. Theory of Machine Lab				
5.1	**Static and dynamic balancing apparatus**			
5.2	**Universal Vibration System**			
5.3	**Screw jack apparatus**			

5.4	**Cam and roller apparatus**			
5.5	**Quick Return motion apparatus**			
5.6	**Gyroscope apparatus**			
5.7	**Geared system**			
5.8	**Whirling of Shaft apparatus**			
5.9	**Equilibrium of forces apparatus**			
5.10	**Miscellaneous**			
5.10.1	Computer system for data acquisition, analysis, storage, software operation and simulation			
5.10.2	Torsional Vibration apparatus			
5.10.3	Free and Damped Torsional Vibration			
5.10.4	Four bar chain apparatus			
5.10.5	Oscillating Cylinder Mechanism			
5.10.6	Geneva Mechanism			
5.10.7	Clutch Plate Friction Apparatus			
5.10.8	Belt Friction Apparatus			
5.10.9	Wheel and Differential Axle			
5.10.10	Compound Pendulum Apparatus			

6. Heat and Mass Transfer Lab				
6.1	**Free & force convection unit with PC based data acquisition**			
6.2	**Thermal Conductivity Apparatus**			
6.3	**Emissivity Measuring Apparatus**			
6.4	**Double Pipe Heat Exchanger (Heat Exchanger Unit)**			
6.5	**Cross Flow Heat Exchanger**			
6.6	**Fins Performance Measuring Apparatus**			
6.7	**Stefan Boltzmann Apparatus**			
6.8	**Miscellaneous**			

6.8.1	Flow boiling Demonstration			
6.8.2	Boiling Heat Transfer Apparatus			
6.8.3	Computer system for data acquisition, analysis, storage, software operation and simulation			
6.8.4	Fire extinguisher			

7. Thermodynamics Lab				
7.1	**Saybolt Visco Meter**			
7.2	**Subsonic wind tunnel working**			
7.3	**Miscellaneous**			
7.3.1	Coulomb's Law Apparatus			
7.3.2	Combination square			
7.3.3	Depth gauge			
7.3.4	Depth micrometer			
7.3.5	Dial depth gauge			
7.3.6	Dial indicator			
7.3.7	Oil hand pump			
7.3.8	Computer system for data acquisition, analysis, storage, software operation and simulation			

8. Refrigeration Lab				
8.1	**General Air- Conditioning Trainer**			
8.2	**Compression Refrigeration Cycle**			
8.3	**Freezing Trainer**			
8.4	**Cutaway Model Hermetic Refrigerant Compressor**			
8.5	**Refrigeration charging and evacuation system**			
8.6	**Miscellaneous**			

8.6.1	a. Vernier Calipers b. Dead weight calibrator c. Micrometer d. Bore gauge e. Vernier bevel Protector f. Transducer & Instrumentation			
8.6.2	Computer system for data acquisition, analysis, storage, software operation and simulation			

9. Solid Mechanics Lab				
9.1	**Torsion of Bars Apparatus**			
9.2	**Universal Testing Machine**			
9.3	**Miscellaneous**			
9.3.1	Vernier Caliper, Analog			
9.3.2	Vernier Caliper, Digital			
9.3.3	Screw Gauge, Analog			
9.3.4	Screw Gauge, Digital			
9.3.5	Hook Law Apparatus			
9.3.6	Optical Bench			
9.3.7	Bi-Convex Lens			
9.3.8	Newton Rings Apparatus			
9.3.9	Vertical Vernier Caliper			
9.3.10	Computer system for data acquisition, analysis, storage, software operation and simulation			

10. Workshop Technology Lab				
10.1	**Pattern Shop** **a.** Pedestal Grinding Wheel **b.** Pattern Milling Machine **c.** Lathe Machine for Wood **d.** Drill Machine Pillar Type **e.** Circular Saw Machine			

	f. Planner Machine for wood **g.** Complete set of relevant tools			
10.2	**Elementary Machine Shop** a. Lathe Machine, Maximum turning dia 6", distance between centres 20" b. Drill Machine Piller type c. Pedestal Grinding Machine d. Complete set of relevant tools 01			
10.3	**Advance Machine Shop** a. Grinding Machine b. Drilling Machine c. Complete set of relevant tools			
10.4	**Smith Shop** a. Power Hammer b. Power Hack Saw c. Blower d. Smith Furnace e. Complete set of relevant tools			
10.5	**Foundry Shop** a. Sand Ramming Machine b. Crucible for cast iron, capacity 5 kg c. Complete set of relevant tools			
10.6	**Welding Shop** a. Welding Plant 50-400 Amp b. Welding Plant Single Phase 50-300 Amp c. Spot Welding Machine d. Electric Soldering Iron e. Complete set of relevant tools			
10.7	**Fitting Shop** a. Drill Machine			

	b. Grinding Machine c. Complete set of relevant hand tools			
10.8	**Miscellaneous**			
10.8.1	Adjustable wrench			
10.8.2	Adjustable wrench			
10.8.3	Allen key set			
10.8.4	Hand grinder machine			
10.8.5	Ball peen hammer			
10.8.6	Bench vice			
10.8.7	Bench vice			
10.8.8	Box spanner set			
10.8.9	Buffing wheel Cotton			
10.8.10	C clamp			
10.8.11	Chisel set			
10.8.12	Chipping hammer			
10.8.13	Drill bits set			
10.8.14	File flat bastered			
10.8.15	File flat smooth			
10.8.16	File half round bastered			
10.8.17	File half round bastered			
10.8.18	File half round bastered			
10.8.19	File half round smooth			
10.8.20	File knife edge			
10.8.21	File round			
10.8.22	File round			
10.8.23	File round			
10.8.24	File square bastered			
10.8.25	File square smooth			
10.8.26	Hammer			

10.8.27	Hammer			
10.8.28	Screwdriver set (champion)			
10.8.29	Scriber			
10.8.30	Spirit level			
10.8.31	Universal vice			
10.8.32	Vernier caliper			
10.8.33	Vernier caliper			
10.8.34	Vernier caliper			
10.8.35	Vernier caliper dial			
10.8.36	Vernier caliper dial			
10.8.37	Hand Wood saw			
10.8.38	Hand Wood saw			
10.8.39	Word punch			
10.8.40	Word punch			
10.8.41	Word punch			
10.8.42	Surface Plates			
10.8.43	Computer system for data acquisition, analysis, storage, software operation and simulation			

Form G: Price Schedule Form

(To be submitted in an envelope duly sealed and marked as Financial Proposal)

Name of the Bidder:		Date:
ITB reference:		

[The Bidder is required to prepare the Price Schedule following the below format. The Price Schedule must include a detailed cost breakdown of all goods and related services to be provided.]

We, the <<Name of Bidder>>, hereby submit our Financial Bid for the Supply of Items as below. We assure you of our full compliance to the required specifications, delivery schedule and other terms without any deviation and/ or reservations. We reiterate our acceptance to the terms and conditions of the of BDS. Our Financial proposal as below is submitted for your kind consideration;

Total Bid Value in Figures (including Extended Warranty Price): _____

Total Bid Value in words (including Extended Warranty Price):_____
_____

Name & Designation of Authorized Person:_____

Signature: _____ (Please affix company stamp here)

Note: Quoted price must be inclusive of all taxes and duties.

ITEMS		Quantity	Unit Price	Taxes	Price (C&F)
1. STRESS ANALYSIS LAB					
1.1	**Stress-opt icon (loading frame for photo elastic models)**	**01**			
1.2	**Reflection Polari scope**	**01**			
1.3	**Digital Oscilloscope**	**01**			
1.4	**Miscellaneous:**				
1.4.1	Computer system for data acquisition, analysis, storage, software operation and simulation	**05**			
1.4.2	Fire Extinguisher: ABC Dry Chemical, 5Kg	**01**			

2. HYDRAULICS & FLUID MECHANICS LAB					
2.1	**Volumetric Hydraulic Bench.**	**02**			
2.2	**Dead Weight Pressure Gauge Calibrator**	**01**			
2.3	**Hydrostatic Pressure Apparatus**	**01**			
2.4	**FLOW OVER WEIRS**	**01**			
2.5	**Bernoulli's Theorem Demonstration Apparatus**	**01**			
2.6	**IMPACT OF A JET**	**01**			
2.7	**FLOW THROUGH ORIFICES**	**01**			
2.8	**OSBORNE REYNOLDS' DEMONSTRATION**	**01**			
2.9	**FREE AND FORCED VORTEX**	**01**			
2.10	**Pelton Turbine (Demonstration Model)**	**01**			
2.11	**Fluid Friction Apparatus**	**01**			
2.12	**Centrifugal Pump performance test apparatus**	**01**			
2.13	**Series and Parallel pump assembly**	**01**			
2.14	**Miscellaneous Tools**				

2. HYDRAULICS & FLUID MECHANICS LAB					
2.14.1	FLOW METER MEASUREMENT APPARATUS:	**01**			
2.14.2	FIRE EXTINGUISHER	**01**			
2.14.3	Computer system for data acquisition, analysis, storage, software operation and simulation	**06**			

3. Production Automation Lab					
3.1	**FMS (Flexible Manufacturing System)**	**01**			
3.2	**CNC Vertical Machining Center**	**01**			
3.3	**EDM Wire Cut**	**01**			
3.4	**CNC Lathe**	**01**			
3.5	**CNC Milling Machine**	**01**			
3.6	**CNC 3D CAM Center Lath & Mill Tools with Computer Software & System**	**01**			
3.7	**Miscellaneous**				
3.7.1	3D printer	**01**			
3.7.2	Fire Extinguisher ABC Dry Chemical, 5Kg	**01**			
3.7.3	Computer system for data acquisition, analysis, storage, software operation and simulation	**04**			

4. Power Plant Lab					
4.1	**Steam power plant with PC data Acquisition**	**01**			
4.2	**Functional Turbojet (Cut Model)**	**01**			
4.3	**Twin Cylinder engine test bed**	**01**			
4.4	**Four stroke Air cooled Sl Engine**	**01**			
4.5	**Heat Pump (Mechanical)**	**01**			
4.6	**Miscellaneous**				
4.6.1	Computer system for data acquisition, analysis, storage, software operation and simulation	**05**			

5. Theory of Machine Lab					
5.1	**Static and dynamic balancing apparatus**	**01**			
5.2	**Universal Vibration System**	**01**			
5.3	**Screw jack apparatus**	**01**			
5.4	**Cam and roller apparatus**	**01**			
5.5	**Quick Return motion apparatus**	**01**			
5.6	**Gyroscope apparatus**	**01**			
5.7	**Geared system**	**01**			
5.8	**Whirling of Shaft apparatus**	**01**			
5.9	**Equilibrium of forces apparatus**	**01**			
5.10	**Miscellaneous**				
5.10.1	Computer system for data acquisition, analysis, storage, software operation and simulation	**05**			
5.10.2	Torsional Vibration apparatus	**01**			
5.10.3	Free and Damped Torsional Vibration	**01**			
5.10.4	Four bar chain apparatus	**01**			
5.10.5	Oscillating Cylinder Mechanism	**01**			
5.10.6	Geneva Mechanism	**01**			
5.10.7	Clutch Plate Friction Apparatus	**01**			
5.10.8	Belt Friction Apparatus	**01**			
5.10.9	Wheel and Differential Axle	**01**			
5.10.10	Compound Pendulum Apparatus	**01**			

6. Heat and Mass Transfer Lab					
6.1	**Free & force convection unit with PC based data acquisition**	**01**			
6.2	**Thermal Conductivity Apparatus**	**01**			
6.3	**Emissivity Measuring Apparatus**	**01**			

6.4	**Double Pipe Heat Exchanger (Heat Exchanger Unit)**	**01**			
6.5	**Cross Flow Heat Exchanger**	**01**			
6.6	**Fins Performance Measuring Apparatus**	**01**			
6.7	**Stefan Boltzmann Apparatus**	**01**			
6.8	**Miscellaneous**				
6.8.1	Flow boiling Demonstration	**01**			
6.8.2	Boiling Heat Transfer Apparatus	**01**			
6.8.3	Computer system for data acquisition, analysis, storage, software operation and simulation	**05**			
6.8.4	Fire extinguisher	**01**			

7. Thermodynamics Lab					
7.1	**Saybolt Visco Meter**	**01**			
7.2	**Subsonic wind tunnel working**	**01**			
7.3	**Miscellaneous**				
7.3.1	Coulomb's Law Apparatus	**01**			
7.3.2	Combination square	**02**			
7.3.3	Depth gauge	**05**			
7.3.4	Depth micrometer	**05**			
7.3.5	Dial depth gauge	**05**			
7.3.6	Dial indicator	**03**			
7.3.7	Oil hand pump	**05**			
7.3.8	Computer system for data acquisition, analysis, storage, software operation and simulation	**05**			

8. Refrigeration Lab					
8.1	**General Air- Conditioning Trainer**	**01**			

8.2	**Compression Refrigeration Cycle**	**01**			
8.3	**Freezing Trainer**	**01**			
8.4	**Refrigeration charging and evacuation system**	**01**			
8.5	**Miscellaneous**				
8.5.1	a. Vernier Calipers b. Dead weight calibrator c. Micrometer d. Bore gauge e. Vernier bevel Protector f. Transducer & Instrumentation	**02 each**			
8.5.2	Computer system for data acquisition, analysis, storage, software operation and simulation	**05**			

9. Solid Mechanics Lab					
9.1	**Torsion of Bars Apparatus**	**01**			
9.2	**Universal Testing Machine**	**01**			
9.3	**Miscellaneous**				
9.3.1	Vernier Caliper, Analog	**04**			
9.3.2	Vernier Caliper, Digital	**04**			
9.3.3	Screw Gauge, Analog	**04**			
9.3.4	Screw Gauge, Digital	**04**			
9.3.5	Hook Law Apparatus	**01**			
9.3.6	Optical Bench	**01**			
9.3.7	Bi-Convex Lens	**01**			
9.3.8	Newton Rings Apparatus	**01**			
9.3.9	Vertical Vernier Caliper	**02**			
9.3.10	Computer system for data acquisition, analysis, storage, software operation and simulation	**05**			

10. Workshop Technology Lab					
10.1	**Pattern Shop**	**01 each**			

	a. Pedestal Grinding Wheel b. Pattern Milling Machine c. Lathe Machine for Wood d. Drill Machine Pillar Type e. Circular Saw Machine f. Planner Machine for wood g. Complete set of relevant tools				
10.2	**Elementary Machine Shop** a. Lathe Machine, Maximum turning dia 6", distance between centres 20" b. Drill Machine Piller type c. Pedestal Grinding Machine d. Complete set of relevant tools 01	**a. 03** **b – d :** **01 each**			
10.3	**Advance Machine Shop** a. Grinding Machine b. Drilling Machine c. Complete set of relevant tools	**01 each**			
10.4	**Smith Shop** a. Power Hammer b. Power Hack Saw c. Blower d. Smith Furnace e. Complete set of relevant tools	**01 each**			
10.5	**Foundry Shop** a. Sand Ramming Machine b. Crucible for cast iron, capacity 5 kg c. Complete set of relevant tools	**01**			
10.6	**Welding Shop** a. Welding Plant 50-400 Amp	**01**			

	b. Welding Plant Single Phase 50-300 Amp c. Spot Welding Machine d. Electric Soldering Iron e. Complete set of relevant tools				
10.7	**Fitting Shop** a. Drill Machine b. Grinding Machine c. Complete set of relevant hand tools	**01**			
10.8	**Miscellaneous**				
10.8.1	Adjustable wrench	**04**			
10.8.2	Adjustable wrench	**03**			
10.8.3	Allen key set	**01**			
10.8.4	Hand grinder machine	**04**			
10.8.5	Ball peen hammer	**05**			
10.8.6	Bench vice	**05**			
10.8.7	Bench vice	**03**			
10.8.8	Box spanner set	**02**			
10.8.9	Buffing wheel Cotton	**03**			
10.8.10	C clamp	**03**			
10.8.11	Chisel set	**03**			
10.8.12	Chipping hammer	**05**			
10.8.13	Drill bits set	**05**			
10.8.14	File flat bastered	**05**			
10.8.15	File flat smooth	**05**			
10.8.16	File half round bastered	**05**			
10.8.17	File half round bastered	**05**			
10.8.18	File half round bastered	**05**			
10.8.19	File half round smooth	**05**			
10.8.20	File knife edge	**05**			

10.8.21	File round	**05**			
10.8.22	File round	**05**			
10.8.23	File round	**05**			
10.8.24	File square bastered	**05**			
10.8.25	File square smooth	**02**			
10.8.26	Hammer	**02**			
10.8.27	Hammer	**03**			
10.8.28	Screwdriver set (champion)	**05**			
10.8.29	Scriber	**05**			
10.8.30	Spirit level	**05**			
10.8.31	Universal vice	**05**			
10.8.32	Vernier caliper	**05**			
10.8.33	Vernier caliper	**05**			
10.8.34	Vernier caliper	**05**			
10.8.35	Vernier caliper dial	**05**			
10.8.36	Vernier caliper dial	**05**			
10.8.37	Hand Wood saw	**08**			
10.8.38	Hand Wood saw	**02**			
10.8.39	Word punch	**02**			
10.8.40	Word punch	**02**			
10.8.41	Word punch	**01**			
10.8.42	Surface Plates	**06**			
10.8.43	Computer system for data acquisition, analysis, storage, software operation and simulation	**04**			

Annexure – I: Integrity Pact

The Bidders will be required to submit the below text on stamp paper after filling in the details and duly signed as well as stamped, as part of their Technical Proposal.

DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC PAYABLE BY THE SUPPLIER OF GOODS, SERVICES & WORK IN CONTRACTS WORTH RS. 10.0 MILLION OR MORE

(To be filled by the bidder as a part of technical proposal)
Contract Number: _____ Dated: _____
Contract Value: _____
Contract Title: _____

_____ hereby declare that it has not obtained or induced the procurement of any contract, right, interest, privilege or other obligation or benefit from Government of Pakistan or any administrative subdivision or agency thereof or any other entity owned or controlled by it (GoP) through any corrupt business partner.

Without limiting the generality of the forgoing, _____ represents and warrants that it has fully declared the brokerage, commission, fees etc. paid or payable to anyone and not given or not given or agreed to give and shall not give or agree to give to anyone within or outside Pakistan either directly or indirectly through any nature or juridical person, including its affiliate, agent, associate, broker, consultant, director, promoter, shareholder, sponsor or subsidiary, any commission, gratification, bribe, finder's fee or kickback, whether described as consultant fee or otherwise, with the object of obtaining or inducing the procurement of a contract, right, interest, privilege or other obligation or benefit in whatever from GoP, except that which has been expressly declared pursuant hereto.

_____ certifies that it has made and will make full disclosure of all agreements and arrangements with all persons in respect of or related to the transaction with GoP and has not taken any action or will not take any action to circumvent the above declaration, representation or warranty.

_____ accept full responsibility and strict liability for making any false declaration, not making full discloser, misrepresenting facts or taking any action likely to defeat the purpose of this declaration, representation and warranty. It agrees that any contract, right, interest, privilege or other obligation or benefit obtained or procured as aforesaid shall, without prejudice to any other right and remedies available to GoP under any law, contract or other instrument, be voidable at the option of GoP.

Notwithstanding any rights and remedies exercised by GoP in this regard, _____ agrees to identify GoP for any loss or damage incurred by it on account of its corrupt business practices and further pay compensation to GoP in an amount equivalent to ten time the sum of any commission, gratification, bribe, finder's fee or kickback given by _____ as aforesaid for the purpose of obtaining or

inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever from GoP.

_____ _____

[Buyer] [Seller / Supplier]

Annexure – II: Draft Contract Sample

THIS AGREEMENT made the _____ day of _____ 2021_____ between [name of Procuring Agency] of [country of Procuring agency] (hereinafter called "the Procuring agency") of the one part and [name of Supplier] of [city and country of Supplier] (hereinafter called "the Supplier") of the other part:

WHEREAS the Procuring agency invited bids for 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.:

1. the Bid Form and the Price Schedule submitted by the Bidder;
2. the Schedule of Requirements;
3. the Technical Specifications;
4. the General Conditions of Contract;
5. the Special Conditions of Contract; and
6. the Procuring agency's Notification of Award.

7. In consideration of the payments to be made by the Procuring agency to the Supplier as hereinafter mentioned, the Supplier hereby covenants with the Procuring agency to provide the goods and services and to remedy defects therein in conformity in all respects with the provisions of the Contract
8. The Procuring agency 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.

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, delivered by _____ the_____ (for the Procuring Agency)

Signed, sealed, delivered by _____ the_____ (for the Supplier)

Witnesses 1. Witnesses2.