



Pak-Austria Fachhochschule: Institute of Applied Sciences & Technology, Haripur

KHYBER PAKHTUNKHWA

REQUEST FOR PROPOSAL (RFP)

FOR

“Supply, Installation & Commissioning of Labs Equipment for Sino-Pak Center for Artificial Intelligence (SPCAI)”

Submission of Bids: Weekday, January 09, 2024 @ 12:00 noon

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Section 1. Letter of Invitation

The Pak-Austria Fachhochschule: Institute of Applied Sciences & Technology (PAF- IAST), Haripur invites sealed bids from interested firms for the “**Supply, Installation & Commissioning of Labs Equipment for Sino-Pak Center for Artificial Intelligence (SPCAI)**” under the following Lots.

Lot. #	Lot Descriptions
Lot 1:	Customized Multi-copters Agile Drone
Lot 2:	Customized Multi-copters Carrier Drone
Lot 3:	Drone Swarm and Safety Net
Lot 4:	Field Robotics Lab
Lot 5:	IoT, Sensors and IT Equipment
Lot 6:	Embedded Systems
Lot 7:	Furniture for Labs - Chairs
Lot 8:	Intelligent Biomedical Lab
Lot 9:	Computer Vision Lab

The bidder must be registered and duly recognized in Pakistan and be registered with FBR; possess Manufacturer’s status or Distributor/ Dealer status with authorization from Manufacturer/ Principal specific for this tender, with sufficient financial, technical, and human resources to take up the task assigned and complete the same within prescribed time limit on the finalization of contract with PAF- IAST.

Tender document containing instructions to bidders covering definitions, introduction/ background of the Project, scope of work, general terms and conditions, and special terms, procedure for submission of bids, opening of bid, evaluation criteria, and other related information, can be obtained against a written request on company’s letterhead, from Pak-Austria Fachhochschule: INSTITUTE of Applied Sciences & Technology, Haripur – Pakistan. Cost of the document is Rs. 500/- Non-refundable (Stationery charges) for each LOT separately. Tender document can also be downloaded from www.paf-iaast.edu.pk/ free of cost, however, the Bid should also be submitted along with Pay Order/ Demand Draft of Rs. 500/- (Stationery Charges). No bid will be accepted without the Tender Document fee.

Bidder(s) interested in participating in the tender process are advised to submit their Bid Proposal(s), along with the Earnest Money amounting 2% of their Bid Value in the shape of CDR, in accordance with the instructions in this tender document. Bid Proposal(s) must reach PAF-IAST, Haripur on Tuesday **January 09, 2024 @ 12:00 noon**. Any late Bid(s) shall not be accepted and returned unopened. Accepted Bids will be opened on the same day at 12:30 hrs, in presence of bidders who chose to attend. In case of sudden holiday on bid opening day, bids will be opened on next working day. The Tender shall be executed in accordance with PPRA Rule 36(b) “Single Stage, Two Envelope Procedure”. This advertisement is also available on PAF: IAST and PPRA websites <http://www.paf-iaast.edu.pk/> & <http://www.ppra.gov.pk> .

Project Director

Sino-Pak Center for Artificial Intelligence (SPCAI)

Pak-Austria Fachhochschule: Institute of Applied Sciences & Technology (PAF-IAST) ,Mang

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Section 2. Instruction to Bidders (ITB)

A. GENERAL TERMS	
1. Introduction	<p>1.1 Bidders shall adhere to all the requirements of this ITB, including any amendments made in writing by PAF-IAST. This ITB will be governed under Clause 36(b) “Single Stage, Two Envelope Procedure” of Public Procurement Regulatory Authority.</p> <p>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 PAF-IAST. The Institute is under no obligation to award a contract to any Bidder as a result of this ITB.</p> <p>1.3 PAF-IAST reserves the right to cancel the procurement process at any stage without any liability of any kind for PAF-IAST, upon notice to the bidders or publication of cancellation notice on PAF- IAST website.</p>
2. Fraud & Corruption, Gifts and Hospitality	<p>2.1 PAF-IAST strictly enforces a policy of zero tolerance on proscribed practices, including fraud, corruption, collusion, unethical or unprofessional practices, and obstruction of PAF-IAST vendors and requires all bidders/ vendors observe the highest standard of ethics during the procurement process and contract implementation.</p> <p>2.2 Bidders/ vendors shall not offer gifts or hospitality of any kind to PAF-IAST staff members including recreational trips to sporting or cultural events, theme parks or offers of holidays, transportation, or invitations to extravagant lunches or dinners.</p> <p>2.3 In pursuance of this policy, PAF-IAST:</p> <p>(a) Shall reject a bid if it determines that the selected bidder has engaged in any corrupt or fraudulent practices in competing for the contract in question;</p> <p>(b) Shall declare a vendor ineligible, either indefinitely or for a stated period, to be awarded a contract if at any time it determines that the vendor has engaged in any corrupt or fraudulent practices in competing for, or in executing a PAF- IAST contract; or counseling or canvassing staff or elected representatives; or engaging in collusion with other bidders.</p>
3. Eligibility	<p>3.1 A Bidder should 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 PAF-IAST whether they are subject to any sanction or temporary suspension imposed by these organizations.</p> <p>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 PAF-IAST.</p>
4. General Terms	<p>4.1 The Bidder should be registered with Sales Tax and Income Tax Department.</p> <p>4.2 The Bidder should have not been blacklisted by any Government/ semi Government organization.</p> <p>4.3 There should be no litigation against the bidder/ firm.</p>

B. PREPARATION OF BIDS	
5. General Considerations	<p>5.1 In preparing the Bid, the Bidder is expected to examine the ITB in detail. Material deficiencies in providing the information requested in the ITB may result in rejection of the Bid.</p> <p>5.2 The Bidder will not be permitted to take advantage of any errors or omissions in the ITB. Should such errors or omissions be discovered, the Bidder must notify the Project Director, SPCAI accordingly.</p>
6. Cost of Preparation of Bid	6.1 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. PAF-IAST shall not be responsible or liable for those costs, regardless of the conduct or outcome of the procurement process.
7. Language	7.1 The Bid, as well as any, and all related correspondence exchanged by the Bidder and PAF- IAST, shall be written in the language(s) specified in the BDS.
8. Documents Comprising the Bid	<p>8.1 The Bid shall comprise of the following documents and related forms of which details are provided in the BDS. All pages of the Bid shall be signed, stamped and properly paginated. Returnable Forms as referred in Section 6 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. Documents Establishing the Eligibility and Qualifications of the Bidder; Bid covering Technical Specifications in detail, and covering Price Schedule; Bid Security, if required by BDS; e) Any attachments and/ or appendices to the Bid.</p>
9. Documents Establishing the Eligibility and Qualifications	9.1 The Bidder shall furnish documentary evidence of its status as an eligible and qualified supplier, using the Forms provided under Section 6 and providing documents required in those forms. In order to award a contract to a Bidder, its qualifications must be documented to PAF-IAST's satisfaction.
10. Technical Bid Format and Content	<p>10.1 The Bidder is required to submit a Bid using the Standard Forms and templates provided in Section 6 of the ITB.</p> <p>10.2 Samples of items, when required as per Section 5, shall be provided within the time specified and unless otherwise specified by the Purchaser, at no expense to the Institute. If not destroyed by testing, samples will be returned at Bidder's request and expense, unless otherwise specified.</p> <p>10.3 When applicable and required in Section 5, the Bidder shall describe the necessary training program available for the maintenance and operation of the equipment offered as well as the 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.</p> <p>10.4 When applicable and required in Section 5, 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.</p>
11. Price Schedule	<p>11.1 The Price Schedule shall be prepared using the Forms provided in Section 6 of the ITB and taking into consideration the requirements in the ITB.</p> <p>11.2 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.</p>

<p>12. Bid Security</p>	<p>12.1 A Bid Security shall be provided in the amount and form indicated in the BDS. The Bid Security shall be valid for the duration as referred in BDS.</p> <p>12.2 The Bid Security shall be included along with the Bid. If Bid Security not found in the Bid, the Bid shall be rejected.</p> <p>12.3 If the Bid Security amount or its validity period is found to be less than what is required, PAF-IAST shall reject the Bid.</p> <p>12.4 In the event an electronic submission is allowed in the BDS, Bidders shall include a copy of the Bid Security in their bid and the original of the Bid Security must be sent via courier or hand delivery as per the instructions in BDS.</p> <p>12.5 The Bid Security will be forfeited by PAF-IAST, and the Bid rejected, in the event of any, or combination, of the following conditions:</p> <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> i. to sign the Contract after PAF-IAST has issued an award; or ii. to furnish the Performance Security, insurances, or other documents that PAF-IAST may require as a condition precedent to the effectivity of the contract that may be awarded to the Bidder.
<p>13. Currencies</p>	<p>13.1 All prices shall be quoted in the currency indicated in the BDS. Where prices are quoted in different currencies, for the purposes of comparison:</p> <ul style="list-style-type: none"> a) PAF-IAST will convert the currency quoted into the currency indicated in BDS, in accordance with the prevailing Inter Bank rate of exchange on the last day of submission of Bids; and b) In the event that PAF-IAST selects a Bid for award that is quoted in a currency different from the preferred currency in the BDS, PAF-IAST shall reserve the right to award the contract in the currency of PAF-IAST's preference, using the conversion method specified above.
<p>14. Joint Venture, Consortium or Association</p>	<p>14.1 If the Bidder is a group of legal entities that will form or have formed a Joint Venture (JV), Consortium or Association for the Bid, they shall confirm in their Bid that : (i) they have designated one party to act as a lead entity, duly vested with authority to legally bind the members of the JV, Consortium or Association jointly and severally, which shall be evidenced by an intent letter or an Agreement among the legal entities duly notarized, and submitted with the Bid; and (ii) if they are awarded the contract, the contract shall be entered into, by and between PAF-IAST and the designated lead entity, who shall be acting for and on behalf of all the member entities comprising the joint venture.</p> <p>14.2 After the Deadline for Submission of Bid, the lead entity identified to represent the JV, Consortium or Association or any change in the constitution of the JV, Consortium or Association shall not be altered without the prior written consent of PAF-IAST/ Procurement Committee.</p> <p>14.3 The lead entity and the member entities of the JV, Consortium or Association shall abide by the provisions of Clause 15 herein in respect of submitting only one Bid.</p> <p>14.4 The description of the organization of the JV, Consortium or Association must clearly define the expected role of each of the entities in the joint venture in delivering the requirements of the ITB, both in the Bid and the JV, Consortium or Association Agreement or Intent Letter. All entities that comprise the JV, Consortium or Association shall be cumulatively subject to the eligibility and</p>

	<p>technical qualification assessment by PAF-IAST as defined in Section 4: Evaluation Criteria.</p> <p>14.5 A JV, Consortium or Association in presenting its track record and experience should clearly differentiate between:</p> <ul style="list-style-type: none"> a) Those that were undertaken together by the JV, Consortium or Association; and b) Those that were undertaken by the individual entities of the JV, Consortium or Association. <p>14.6 Previous contracts completed by individual experts working privately but who are permanently or were temporarily associated with any of the member firms cannot be claimed as the experience of the JV, Consortium or Association or those of its members, but should only be claimed by the individual experts themselves in their presentation of their individual credentials.</p>
15. Only One Bid	<p>15.1 The Bidder (including the individual members of any Joint Venture) shall submit only one Bid, either in its own name or as part of a Joint Venture.</p> <p>15.2 Bids submitted by two (2) or more Bidders shall all be rejected if they are found to have any of the following:</p> <ul style="list-style-type: none"> a) they have at least one controlling partner, director or shareholder in common; or b) any one of them receive or have received any direct or indirect subsidy from the other/s; or c) they have the same legal representative for purposes of this ITB; or d) they are subcontractors to each other's Bid, or a subcontractor to one Bid also submits another Bid under its name as lead Bidder; or some key personnel proposed to be in the team of one Bidder participates in more than one Bid received for this ITB process. This condition relating to the personnel, does not apply to subcontractors being included in more than one Bid.
16. Bid Validity Period	<p>16.1 Bids shall remain valid for the period specified in the BDS, commencing on the Deadline for Submission of Bids. A Bid valid for a shorter period may be rejected by PAF-IAST and rendered non-responsive.</p> <p>16.2 During the Bid validity period, the Bidder shall maintain its original Bid without any change, including the availability of the Key Personnel.</p>
17. Extension of Bid Validity Period	<p>17.1 In exceptional circumstances, prior to the expiration of the Bid validity period, PAF-IAST may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing and shall be considered integral to the Bid.</p> <p>17.2 If the Bidder agrees to extend the validity of its Bid, it shall be done without any change to the original Bid.</p> <p>17.3 The Bidder has the right to refuse to extend the validity of its Bid, in which case, the Bid shall not be further evaluated.</p>
18. Clarification on ITB (from the Bidders)	<p>18.1 Bidders may request clarifications on any of the ITB documents no later than the date indicated in the BDS. Any request for clarification must be sent in writing in the manner indicated in the BDS. If inquiries are sent other than specified channel, even if they are sent to a PAF-IAST staff member, PAF-IAST shall have no obligation to respond or confirm that the query was officially received.</p>

	<p>18.2 PAF-IAST will provide the responses to clarifications through the method specified in the BDS.</p> <p>18.3 PAF-IAST shall endeavor to provide responses to clarifications in an expeditious manner, but any delay in such response shall not cause an obligation on the part of PAF-IAST to extend the submission date of the Bids, unless PAF-IAST deems that such an extension is justified and necessary.</p>
19. Amendment in ITB	<p>19.1 At any time prior to the deadline of Bid submission, PAF-IAST may for any reason, such as in response to a clarification requested by a Bidder, modify the ITB in the form of an amendment to the ITB. Amendments will be made available to all prospective bidders.</p> <p>19.2 If the amendment is substantial, PAF-IAST may extend the Deadline for submission of Bid to give the Bidders reasonable time to incorporate the amendment into their Bids.</p>
20. Alternative Bids	<p>20.1 Unless otherwise specified in the BDS, alternative Bids shall not be considered. If submission of alternative Bid is allowed by BDS, a Bidder may submit an alternative Bid, but only if it also submits a Bid conforming to the ITB requirements. Where the conditions for its acceptance are met, or justifications are clearly established, PAF-IAST reserves the right to award a contract based on an alternative Bid.</p> <p>20.2 If multiple/ alternative bids are being submitted, they must be clearly marked as "Main Bid" and "Alternative Bid"</p>
21. Pre-Bid Conference	<p>21.1 When appropriate, a pre-bid conference may be conducted at the date, time and location specified in the BDS. All Bidders are encouraged to attend. Non-attendance, however, shall not result in disqualification of an interested Bidder. Minutes of the Bidder's conference will be disseminated on the procurement website and/ or shared by email as specified in the BDS. No verbal statement made during the conference shall modify the terms and conditions of the ITB, unless specifically incorporated in the Minutes of the Bidder's Conference or issued/ posted as an amendment to ITB.</p>

C. SUBMISSION AND OPENING OF BIDS

22. Bid Proposal Submission	<p>22.1 The Bidder shall submit a duly signed and numbered all pages of the complete Bid in an Envelope sealed and marked as per ITB 22.6, and in accordance with PPRA Rule 36(b).</p> <p>22.2 The Outer Envelope should contain Two (02) separate sealed envelopes, one of which comprising the Forms (A – F) and supporting documents in accordance with requirements in the BDS, shall be marked as "Technical Proposal". Whereas, the other envelope containing the Form G: Price Schedule Form shall be marked as "Financial Proposal".</p> <p>22.3 The Bid Security as referred in BDS must be placed in the "Financial Proposal" but in duly sealed envelope and marked as "Bid Security". However, an Affidavit stating that the Bid Security (without indicating the amount) has been placed in the Financial Proposal, should be enclosed in "Technical Proposal". Bid Security envelope will be opened with financial proposal of Technically qualified bidders.</p> <p>22.4 Bid can be delivered either personally, or by courier as specified in the BDS.</p>
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	<p>22.5 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 not be errors and/ or over-writings. Corrections (if any) should be made clearly and initialed with dates.</p> <p>22.6 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.</p> <p>22.7 Hard copy submission by courier or hand delivery allowed or specified in the BDS shall be governed as follows:</p> <p>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.</p> <p>(b) The Bid Proposals must be sealed and submitted in an envelope, which shall:</p> <p>i. Bear the name of the Bidder;</p> <p>ii. Be addressed to PAF - IAST as specified in the BDS; and</p> <p>iii. Bear a warning not to open before the time and date for Bid opening as specified in the BDS.</p> <p>If the envelope with the Bid is not sealed and marked as required, PAF-IAST shall assume no responsibility for the misplacement, loss, or premature opening of the Bid.</p>
<p>23. Deadline for Submission of Bids and Late Bids</p> <p>24. Withdrawal, Substitution, and Modification of Bids</p>	<p>23.1 Complete Bids must be received by PAF-IAST in the manner, and no later than the date and time, specified in the BDS. PAF-IAST shall only recognize the actual date and time that the bid was received by PAF-IAST.</p> <p>23.2 PAF-IAST shall not consider any Bid that is received after the deadline for the submission of Bids.</p> <p>24.1 A Bidder may withdraw, substitute or modify its Bid after it has been submitted at any time prior to the deadline for submission.</p> <p>24.2 A bidder may withdraw, substitute or modify its Bid by sending a written notice to PAF- IAST, 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."</p> <p>24.3 Bids requested to be withdrawn shall be returned unopened to the Bidders, except if the bid is withdrawn after the bid has been opened.</p>
<p>25. Bid Opening</p>	<p>25.1 The Procurement Committee of PAF- IAST will open the Bid in the presence of Bidders' representative(s) who choose to attend.</p> <p>25.2 The Bidders' names, modifications, withdrawals, the condition of the envelope labels/ seals, the number of folders/ files and all other such other details as PAFIAST may consider appropriate, will be announced at the opening. No Bid shall be rejected at the opening stage, except for late submissions, in which case, the Bid shall be returned unopened to the Bidders.</p> <p>25.3 In case of public holiday on bid opening day, bids will be opened on next working day.</p>

D. EVALUATION OF BIDS	
26. Confidentiality	<p>26.1 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.</p> <p>26.2 Any effort by a Bidder to influence PAF-IAST in the examination, evaluation and comparison of the Bids or contract award decisions may, at PAF-IAST's decision, result in the rejection of its Bid and may subsequently be subject to consequences.</p>
27. Preliminary Examination	<p>27.1 PAF-IAST 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. PAF-IAST reserves the right to reject any Bid at this stage.</p>
28. Evaluation of Eligibility and Technical Qualification	<p>28.1 Eligibility and Technical Qualification of the Bidder will be evaluated against the Minimum Eligibility/ Qualification requirements specified in the Section 4: Evaluation Criteria.</p> <p>28.2 In general terms, Bidders that meet the following criteria may be considered qualified:</p> <ol style="list-style-type: none"> a) They are not included in the list of blacklisted or barred companies published on PPRA website, any federal or provincial government department; b) They have a good financial standing and have access to adequate financial resources to perform the contract and all existing commercial commitments, c) They have the necessary experience, technical expertise, production capacity, quality certifications, quality assurance procedures and other resources applicable to the supply of goods and/ or services required; d) They are able to comply fully with the General Terms and Conditions of Contract; e) They do not have a consistent history of court/ arbitral award decisions against the Bidder; and f) They have a record of timely and satisfactory performance with their clients.
29. Evaluation of Bid Proposals	<p>29.1 The evaluation team shall review and evaluate the Bids on the basis of their responsiveness to the Schedule of Requirements and Technical Specifications and other documentation provided, applying the procedure indicated in the BDS and other ITB documents. When necessary, and if stated in the BDS, PAF- IAST may invite technically responsive bidders for a presentation related to their Bids. The conditions for the presentation shall be provided in the bid document where required.</p>
30. Due diligence	<p>30.1 PAF- IAST 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:</p> <ol style="list-style-type: none"> 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;

	<p>e) Physical inspection of the Bidder’s offices, branches or other places where business transpires, with or without notice to the Bidder;</p> <p>f) Other means that PAF-IAST may deem appropriate, at any stage within the selection process, prior to declaring the Bidder as Qualified.</p>
31. Clarification of Bids	<p>31.1 To assist in the examination, evaluation and comparison of Bids, PAF- IAST may, at its discretion, request any Bidder for a clarification of its Bid.</p> <p>31.2 PAF- IAST’s 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 PAF-IAST in the evaluation of the Bids in accordance with the ITB.</p> <p>31.3 Any unsolicited clarification submitted by a Bidder in respect to its Bid, which is not a response to a request by PAF-IAST, may not be considered during the review and evaluation of the Bids.</p>
32. Responsiveness of Bid	<p>32.1 PAF-IAST’s 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.</p> <p>32.2 If a bid is not substantially responsive, it may be rejected by PAF-IAST and may not subsequently be made responsive by the Bidder by correction of the material deviation, reservation, or omission.</p>
33. Right to Accept, Reject, Any or All Bids	<p>33.1 PAF-IAST 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.</p> <p>33.2 PAF- IAST shall not be obliged to award the contract to the lowest priced offer.</p>
34. Nonconformities, Reparable Errors and Omissions	<p>34.1 Provided that a Bid is substantially responsive, PAF-IAST may waive any nonconformities or omissions in the Bid that, in the opinion of PAF-IAST, do not constitute a material deviation.</p> <p>34.2 PAF-IAST 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.</p>
	<p>34.3 For the Price Schedule that are submitted, PAF-IAST shall check and correct arithmetical errors as follows:</p> <p>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 PAF- IAST 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;</p>

	<p>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</p> <p>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.</p> <p>34.4 If the Bidder does not accept the correction of errors made by PAF- IAST, its Bid shall be rejected.</p>
35. Bidder Grievance	35.1 PAF- IAST’s 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 PAF-IAST’s Grievance Readdress Committee.
E. AWARD OF CONTRACT	
36. Evaluation	<p>36.1 PAF-IAST will conduct the evaluation solely on the basis of response to this tender received from the firms.</p> <p>36.2 Evaluation shall be undertaken in the following steps:</p> <p>a) Preliminary Examination including Technical Specifications and other compliances</p> <p>b) Arithmetical check and ranking of bidders who passed preliminary examination by price.</p> <p>c) Evaluation of prices</p> <p>36.3 Price comparison shall be based on the landed price, including transportation, insurance and the total cost of ownership (including spare parts, consumption, installation, commissioning, training, special packaging, etc., where applicable)</p>
37. Integrity Pact	37.1 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 Annex – I.
38. Award Criteria	<p>38.1 Prior to expiration of the period of Proposal validity, PAF-IAST shall award the contract to the Bidder that is found to be responsive to the requirements of the Technical Specifications and has offered the lowest price.</p> <p>38.2 PAF-IAST shall not be obliged to award the contract to the lowest priced offer, if the response is found deficient to the Technical Specifications and other compliances.</p> <p>38.3 In case of tie in Financial Bid Value, the Contract will be awarded to the bidder having more closest match to the Technical Specifications.</p>
39. Contract Signing	39.1 After the approval of any Work Award, a Contract Agreement on the stamp paper of appropriate value, shall be executed by PAF-IAST with Selected Bidder (i.e. Contractor) within 15 days from the date of issuance of Lol (Letter of Intent)/ Work Order.
	39.2 Failure to signing of Contract Agreement by the selected Bidder Firm with PAF-IAST 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, PAF- IAST may award the Contract to the Second highest rated or call for new Proposals.

40. Right to Vary quantity at the Time of Award	40.1 At the time of award of Contract, PAF-IAST reserves the right to vary the quantity of goods and/ or services, without any change in the unit price or other terms and conditions.
41. Sample draft Contract	41.1 A sample draft Contract to be signed, containing applicable General Terms and Conditions can be found at Annex – II.
42. Performance Security	42.1 A performance security, if required in the BDS, 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 PAF-IAST shall be a condition for rendering the contract effective.
43. Bank Guarantee for Advanced Payment	43.1 No Payment will be released in advance.
44. Liquidated Damages	44.1 PAF-IAST shall apply Liquidated Damages for the damages and/ or risks caused to PAF-IAST resulting from the Contractor's delays or breach of its obligations as per Contract. a) In case of delay, the Procurement Committee, PAF-IAST 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 PAF-IAST requirement, the Rector, PAF-IAST reserves the right to reject it 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 PAF-IAST requirements, PAF-IAST 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 Rector, PAF-IAST whose decision will be binding on both the parties.
45. Force Majeure	45.1 "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 Project Director, SPCAI whose decision will be final.
46. Delivery of Goods	46.1 Contractor will be required to deliver the goods as per the Delivery Schedule referred in BDS without claiming any additional cost to the PAF-IAST at the designated site(s) and in quantities as referred in the Contract.
47. Payment Provisions	47.1 Payment may be made through LC (Letter of Credit) which will be Open by PAF-IAST within 30 days after signing the Contract. However, Payment will be made only upon PAF-IAST's 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 proper authority in PAF: IAST. Payment will be affected by bank transfer in the currency of the contract. 47.2 The Contractor shall provide all necessary supporting documents along with GST invoice, delivery challan and any other relevant documents as required by the PAF-IAST.

Section 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 annexes or references attached to the Bid Data Sheet, the provisions in the Bid Data Sheet shall prevail.

BDS No.	Ref. to Section.2	Data	Specific Instructions / Requirements
1.		Background of the Project	<p>Pak-Austria Fachhochschule: Institute of Applied Sciences and Technology (PAF: IAST) is novel in its content and holistic in approach. The project concept is based on the slogan of “Skilling Pakistan” to create a high-quality technical education infrastructure. This unique educational institution in Pakistan will closely collaborate with several institutions in Austria and China and award multiple foreign degrees. This is a historic and visionary initiative as it is probably the first time that an institution will be established in Pakistan with many foreign universities giving degrees to students who study in it.</p>
2.		Objective	<p>The main objective of this Tender is to equip the PAF-IAST with necessary and advanced level of laboratory facilities, providing enabling environment to the students and faculty to perform their academic and research work in a conducive and productive environment and deliver beyond the expectations.</p>
3.		Scope of Work	<p>Supply of Laboratory Equipment The required items in various Lots as referred in Section – 5 have been sought by Sino-Pak Center for Artificial Intelligence (SPCAI) from a reputed Firms/ Companies. The supplier is expected to supply high quality products meeting the specification as stipulated in this ITB, which conforms to the international quality standards. The time specified for delivery, Installation and Commissioning in the tender form shall be deemed to be the essence of the contract and the Successful Bidder shall arrange within the specified period.</p> <p>Post-Delivery Warranty and Support Services It is required that Manufacturer’s Warranty and Post-delivery Bidder’s Support Services for at least One (01) year from the date of commissioning at PAF-IAST be provided by the Supplier within the quoted cost of items.</p> <p>Moreover, additional Warranty and Support Services for next two (02) years should be quoted separately by the Bidder on annual payment basis. However, it will be at sole discretion of PAF-IAST to avail additional Warranty and Support Services in subsequent year(s) or otherwise.</p>
4.	7	Language of the Bid	English

5.	22, 23, 27	Submitting Bids for Parts or subparts of the Schedule of Requirements (partial bids)	The Purchase Committee shall consider the Bids Lot-wise (i.e. package against each of the Lots) as referred in Section – 5. Any item not quoted in the respective Lot shall have reasonable grounds to reject the Bid for that Lot.
6.	20	Alternative Bids	Not Allowed.
7.	16	Bid Validity Period	90 days
8.	13	Bid Security/ Earnest Money (Refundable)	Required in the amount of: 2% of the Bid Value amount (including Extended Warranty) quoted in DDP (in PKR) for each Lot (separately) against which the Bidder is participating. In case of options, earnest money shall be based on the maximum quoted price of the same items in the Lot. 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 Project Director SPCAI, PAF-IAST
9.	42	Liquidated Damages	Will be imposed as follows: Percentage of contract price per day of delay: as referred to in Draft Contract Sample in Annexure – II.
10.	40	Performance Security	Within one week of issuance of Lol/ Purchase Order and well prior to the signing of Contract, as 10% of the Contract value for the duration of Warranty period referred in RFP.
11.	12	Currency of Bid	Both Pakistani Rupees (PKR) for DDP
12.	31	Deadline for submitting requests for clarifications/ questions	5 days before the submission deadline
13.	31	Contact Details for submitting clarifications/ questions	Focal Person in SPCAI: Dr. Sohail Khan sohail.khan@spcai.paf-iast.edu.pk Equipment related queries: Mr. Muhammad Usama Qureshi usama.qureshi@spcai.paf-iast.edu.pk Bid preparation and documentation related queries: Mr. Syed Wajid Shah wajid.shah@spcai.paf-iast.edu.pk
14.	18, 19, and 21	Manner of Disseminating Supplemental Information to the ITB and responses/ clarifications to queries	Direct communication to prospective Bidders by email and/ or Posting on the PAF: IAST website: wajid.shah@spcai.paf-iast.edu.pk
15.	23	Deadline for Submission	Tuesday the January 09, 2024 @ 12:00 noon (PST)

16.	22	Number of Set(s) of Bid	<p>Technical Proposal(s)</p> <ul style="list-style-type: none"> - One (01) Original - One (01) Copy - Soft copy of Technical Proposal in a USB Flash Drive or by email to Mr. Wajid Shah (wajid.shah@spcai.paf-iaast.edu.pk) <p>Financial Proposal(s)</p> <ul style="list-style-type: none"> - One (01) Original <p>Note: Bidders are required to prepare and submit the Proposal(s) against the Lot(s) separately in separate envelopes, in which they intend to participate.</p>								
17.	22	Allowable Manner of Submitting Bids	<input checked="" type="checkbox"/> Courier/ Hand Delivery								
18.	22	Bid Submission Address	<input checked="" type="checkbox"/> By Courier / Hand Delivery: Convener Procurement Committee, PAF- IAST, Mang, Haripur								
19.	22	Electronic submission (email) requirements	Not Allowed								
20.	25	Date, time and venue for the opening of bid	Date and Time: January 09, 2024 @ 12:00 noon Venue: Conference Room, PAF-IAST, Mang, Haripur								
21.	27, 36	Evaluation Method	Eligible and qualified bids meeting the PAF- IAST requirements and technically responsive as stipulated in this ITB								
22.		Evaluation Method for the Award of Contract	Lowest priced technically responsive								
23.		Expected date for commencement of Contract	February 2024								
24.		Maximum expected duration of Contract	36 months								
25.	35	PAF: IAST will award the contract to:	One Bidder Only against each Lot								
26.	39	Type and Contract Terms and Conditions that will apply	PAF-IAST General Terms and Conditions for Contracts for Goods and/ or Services as per Sample at Annex – II.								
27.	46	Delivery, Installation and Testing/ Training	<table border="1"> <thead> <tr> <th></th> <th>Delivery</th> <th>Installation</th> <th>Testing/ Training</th> </tr> </thead> <tbody> <tr> <td>LOT # 1-9</td> <td>14-16 weeks</td> <td>2 weeks</td> <td>2 week</td> </tr> </tbody> </table>		Delivery	Installation	Testing/ Training	LOT # 1-9	14-16 weeks	2 weeks	2 week
	Delivery	Installation	Testing/ Training								
LOT # 1-9	14-16 weeks	2 weeks	2 week								

Section 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. 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	Participating as <input type="checkbox"/> Individual Company <input type="checkbox"/> 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 or in Haripur. Alternately, if the Contract is awarded, the Bidder may be asked to establish office in either of these cities.	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 2 years no less than Rs. 3 million <i>(For JV/ Consortium/ Association, all Parties cumulatively should meet requirement).</i>	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 <i>(For JV/Consortium/Association, all Parties cumulatively should meet requirement).</i>	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 organization in Pakistan, in accordance with ITB clause 3.	Form A: Bid Submission Form
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

QUALIFICATION					
S. #	Attribute	Description	Max. Score	Criteria	Returnable Form(s)
Section – I: General Corporate Profile			25		
1.	Bidder’s Footprints	Number of offices/ services centers across the country	5	3+ offices fully operational for last five (05) year	Form C: Bidder Information Form
			3	2 – 4 offices fully operational for last five (05) year	
			1	1 offices fully operational for last two (02) year	
2.	Bidder’s Human Resource Strength	Number of full-time employees (documentary proof required)	8	40+ employees with at least 20% Technical staff with at least 10% having technical certification	Form C: Bidder Information Form
			6	25 – 39 employees with at least 20% Technical staff at least 10% having technical certification	
			4	9 – 24 employees with at least 20% Technical staff at least 10% having technical certification	
			2	<8 employees with at least 20% Technical staff at least 10% having technical certification	
3.	Financial Standing	Annual Turnover averaged over last 3 years	7	2+ x Financial Strength	Form D: Qualification Form
			4	2 x Financial Strength	
			2	1.5 x Financial Strength	
4.	Annual Tax Paid	Annual Tax Paid averaged over last 3 years	5	Rs. 2+ million or more	Form D: Qualification Form
			3	Rs. 1.0 – 2.0 million	
			2	Rs. 0.5 – 1.0 million	
Section – II: Business Profile			30		
5.	Relevant Experience		7	Min. No. of Projects + 5	
			5	Min. No. of Projects + 3	

		Project(s) of similar nature, value and complexity completed.	3	Min. No. of Projects + 2	Form D: Qualification Form
6.	Public Sector Experience	Project(s) delivered to government organizations	9	5 Projects worth \$0.5 million or more each	Form D: Qualification Form
			7	3 Projects worth \$0.25-0.49 million each	
			5	2 Projects worth \$0.05-0.24 million each	
7.	Education Sector Experience	Project(s) completed at education institutions.	9	2+ Projects	Form D: Qualification Form
			7	2 Projects	
			5	1 Project	
8.	Experience in KP	Project(s) completed in KP	5	Project worth Rs 5 million in KP	Form D: Qualification Form
			3	Project worth Rs 2.5 million in KP	
Section – III: Manufacturer’s/ Product’s Strengths			10		
9.	Manufacturer’s Global Presence	Countries having supplied the same Quoted items	5	No. of countries identified by Bid in consideration/ Max. No. of countries identified in all Bids * 10	Form E: Project Proposal Form
10.	Manufacturer’s Products Portfolio	Various Products produced by the manufacturer beyond quoted items	5	No. of relevant Products mentioned by Bid in consideration/ Max. No. of Products referred in all Bids * 10	Form E: Project Proposal Form
Section – IV: Registration & Certifications			10		
11.	ISO 9001 Certified or equal if apply	Bidder or the Lead Bidder in case of JV should be Certified	5	Copy of Valid Certificate	Form E: Project Proposal Form
12.	Certification specific to quoted Products/ Solution	Bidder or any of the JV Partners or Principal should possess them	5	Copy of Valid Certificate(s) of the quoted Product(s)	Form E: Project Proposal Form
Section – V: Presentation on Project Proposal			25		
13.	Project Management Approach	Overall approach towards planning and implementing the project.	8	To be assigned by the Technical Committee	Form E: Project Proposal Form
14.	Post-Commissioning Services	Overall approach towards after-sale support and services.	7	To be assigned by the Technical Committee	Form E: Project Proposal Form
15.	Distinguishing Features	Distinguishing features of the quoted Product and/ or overall project proposed.	10	To be assigned by the Technical Committee	Form E: Project Proposal Form
Grand Total			100		

	Technical Evaluation	Bids shall be evaluated on both Eligibility and Technical Qualification Criteria. Bidders meeting the Eligibility Criteria and able to secure 60 percent in Technical qualification shall be declared as Technically Qualified Bidders for the next step, i.e. Opening of Financial Bid.
	Financial Evaluation	Detailed analysis of the price schedule based on requirements listed in Section 5 and quoted for by the bidders in Form F. Price comparison shall be based on the landed price, including transportation, insurance, duties, taxes and the total cost of ownership (including spare parts, consumption, installation, commissioning, training, special packaging, etc., where applicable). Comparison with budget/internal estimates. Tender will be awarded on least-cost basis .

Section 5a: Technical Specifications of the Required Goods

S. No.	Lot 1: Customized Multi-copters Agile Drone	
1	Custom-Build Agile Multicopter Quantity: 1	
	Base	Carbon fiber multi-copter frame
	Autopilot system	Pixhawk Autopilot
	GPS	GPS CAN Module GPS / Module with CAN Bus
	Camera	4K Camera with gimbal
	Propellers	Carbon fiber propellers with appropriate dimensions
	Speed Controller	Electronic Speed Controller
	Propeller motor	Brushless DC motors for propellers
	Stand	Tripod Stand for Ground unit
	RF Transceiver	RF Transmitter with Receiver
	Cables	Servo Cable RF cables 12awg 14awg 16awg 20awg 26awg Silicon wires As per the mentioned technical specifications of multi-copter
	Connectors	RF Connectors
	Charger	Charger to meet the mentioned technical specifications of multi-copter
	Telemetry	Telemetry Module with Telemetry Cables required for ensuring communication with the Multicopter during flight radius
	Battery 1	Battery to meet the operational requirements for aerial unit
	Battery 2	Battery for ground unit.
	Maximum Service Ceiling Above Sea Level:	1000 m or better
	Maximum Speed:	30 Km/h or better
	Maximum Flight Time:	15 minutes or better
	Maximum Flight radius:	2 KM or better
	Absolute accuracy	Vertical: $\pm 0.5\text{m}$ or better (with ground control points) Horizontal: $\pm 0.5\text{m}$ or better (with ground control points)
	Software	Remote controller software that can be installed on the tablet for navigation control and monitoring
	On Multi-copter Video Recording:	4K UHD or better
	Video Live Stream	HD Video or better
	Video Interface	TCP/IP Ethernet

	Addon 1	Provision of on-board computer in terms of dimensions and compatibility with Jetson AGX Orin Developer Kits
	Addon 2	Depth Camera
	Addon 3	Camera Interface dev kit compatible with Jetson AGX Orin
	Addon 4	Provision of on-board computer in terms of dimensions and compatibility with Raspberry pi 4 board (8GB+)
	Addon 5	MB1220 XL-MaxSonar-EZ2 Rangefinders on each wing or equivalent or better for obstacle avoidance and are operational by default
2	RTK-GNSS Base station (Here+V2 or Equivalent/Better)	
	Quantity: 1	
	GNSS module	u-blox NEO-M8P-2 or better
	Ceramic antenna	CGGBP.25.4.A.02 or better
	Connectors	At least the following connectors: USB, UART, SMA
	GNSS Signals Support	At least the following: GPS L1 C/A, GLONASS L10F, BeiDou B11
	Working Voltage:	5V or better
	Working Temperature:	-40°C to +85°C or better
	Time-To-First-Fix:	GPS & GLONASS: ≤26s (cold start) or better ≤1s (hot start) or better ≤2s (aided start) or better
3	Extra Aerial & Ground batteries	
	Quantity: 1	
	Aerial Battery for Agile multi-copter	As per the technical specification of Agile multi-copter
	Ground Battery for Agile multi-copter	As per the technical specification of Agile multi-copter
	Aerial Battery for Carrier multi-copter	As per the technical specification of Carrier multi-copter
	Ground Battery for Carrier multi-copter	As per the technical specification of Carrier multi-copter

S. No.	Lot 2: Customized Multi-copters Carrier Drone	
1	Custom-Built Carrier Multi-copter Quantity: 1	
	Base	Carbon fiber multi-copter frame
	Autopilot system	Pixhawk Autopilot
	GPS	GPS CAN Module GPS / Module with CAN Bus
	Camera	4K Camera with gimbal or better
	Propellers	Carbon fiber propellers with appropriate dimensions
	Speed Controller	Electronic Speed Controller
	Propeller motor	Brushless DC motors for propellers
	Stand	Tripod Stand for Ground unit
	RF Transceiver	RF Transmitter with Receiver compatible with multi-copter
	Cables	Servo Cable RF cables 12awg 14awg 16awg 20awg 26awg Silicon wires As per the mentioned technical specifications of multi-copter
	Connectors	RF Connectors
	Charger	Charger to meet the mentioned technical specifications of multi-copter
	Telemetry	Telemetry Module with Telemetry Cables required for ensuring communication with the Multicopter during flight radius
	Battery 1	Battery to meet the operational requirements for aerial unit
	Battery 2	Battery for ground unit.
	Maximum Service Ceiling Above Sea Level:	500 m or better
	Maximum Speed:	20 Km/h or better
	Maximum Flight Time:	30 minutes or better
	Maximum Flight radius:	2 KM or better
	Load carrying capability	5 KG or above
	Absolute accuracy	Vertical: ± 0.5 m or better (with ground control points) Horizontal: ± 0.5 m or better (with ground control points)
	Software	Remote controller software that can be installed on the tablet for navigation control and monitoring
	On Multi-copter Video Recording:	4K UHD or better
	Video Live Stream	HD Video or better
	Video Interface	TCP/IP Ethernet

	Load-carrying capability	5 KG including payload attachment and bay or better. The bay is preferred to have a provision for connecting the ground robot or related equipment.
	Addon 1	Provision of on-board computer in terms of dimensions and compatibility with Jetson AGX Orin Developer Kits
	Addon 2	Depth Camera
	Addon 3	Camera Interface dev kit compatible with Jetson AGX Orin
	Addon 4	Provision of on-board computer in terms of dimensions and compatibility with Raspberry pi 4 board (8GB+)
	Addon 5	MB1220 XL-MaxSonar-EZ2 Rangefinders on each wing or equivalent or better for obstacle avoidance and are operational by default
2	RTK-GNSS Base station (Here+V2 or Equivalent/Better)	
	Quantity: 1	
	GNSS module	u-blox NEO-M8P-2 or better
	Ceramic antenna	CGGBP.25.4.A.02 or better
	Connectors	At least the following connectors: USB, UART, SMA
	GNSS Signals Support	At least the following: GPS L1 C/A, GLONASS L10F, BeiDou B11
	Working Voltage:	5V or better
	Working Temperature:	-40°C to +85°C or better
	Time-To-First-Fix:	GPS & GLONASS: ≤26s (cold start) or better ≤1s (hot start) or better ≤2s (aided start) or better
3	Extra Aerial & Ground batteries	
	Quantity: 1	
	Aerial Battery for Agile multi-copter	As per the technical specification of Agile multi-copter
	Ground Battery for Agile multi-copter	As per the technical specification of Agile multi-copter
	Aerial Battery for Carrier multi-copter	As per the technical specification of Carrier multi-copter
	Ground Battery for Carrier multi-copter	As per the technical specification of Carrier multi-copter

S. No.	Lot 3: Drone Swarm and Safety Net	
1	Flame-Retardant Drone Safety Net (Custom-Made) Dimensions: 30 x 100 Feet Quantity: 1	
	Material	high tenacity polypropylene, knotless, flame-retardant, or better
	Mesh Size	45 x 45 mm or smaller
	Net Size	At least 30 x 100 Feet (width x length)
	Pose of Meshes	Quadratic (square)
	Mesh Connection	Knotless braid
	Edge Design	Reinforced selvage cord of approx. 7 mm or better
	Max. Tensile Strength of a Mesh	700 N or better
	Standards and Rules	DIN 4102 (B1, flame-retarding), non-flaming dripping
	Certificate	MPA-Bau certification report P-NDS04-851, Oeko-Tex® certificate 12.0.02466 or equivalent
	Continuous Operating Temperature	-40 to +80 °C or better
	Melting Point	165 °C or better
	Tensile Strength After Two Years of Climatic Influences:	90% or better
	Weight per Unit Area:	<= 100 g/m ²
2	Flame-Retardant Drone Safety Net (Custom-Made) Dimensions: 25 x 25 Feet Quantity: 1	
	Material	high tenacity polypropylene, knotless, flame-retardant, or better
	Mesh Size	45 x 45 mm or smaller
	Net Size	At least 30 x 70 Feet (width x length)
	Pose of Meshes	Quadratic (square)
	Mesh Connection	Knotless braid
	Edge Design	Reinforced selvage cord of approx. 7 mm or better
	Max. Tensile Strength of a Mesh	700 N or better
	Standards and Rules	DIN 4102 (B1, flame-retarding), non-flaming dripping
	Certificate	MPA-Bau certification report P-NDS04-851, Oeko-Tex® certificate 12.0.02466 or equivalent
	Continuous Operating Temperature	-40 to +80 °C or better
	Melting Point	165 °C or better
	Tensile Strength After Two Years of Climatic Influences:	90% or better
	Weight per Unit Area:	<= 100 g/m ²
3	Loco swarm bundle inclusive additional highlighted accessories Quantity: 2	

	The bundle contains the LPS system configuration which supports TDoA where a virtually infinite amount of Crazyflies can be positioned simultaneously. It also contains 10 Crazyflies with the LPS decks for positioning.	
	Bundle content	
	Name	Quantity
	Loco Positioning Nodes	08
	Loco Positioning Deck	10
	Crazyflie 2.1 kit	10
	Crazyradio PA	3
	350mAh LiPo battery	20
	including 500mA USB charger	10
	Male spare connectors	10
	Qi 1.2 wireless charging deck	10
	Compatible WPC V1.2 based Qi charger	10
	Spare part bundle: 2 x Crazyflie 2.X spare motor (7mm DC motors) 2 x Crazyflie 2.X spare motor mounts pack (total of 8 motor mounts) 1 x Crazyflie 2.X spare propeller pack (4 x CW and 4 x CCW)	10
	Accessory – LED-ring deck	10
4	Drone DJI Mavic 3 Pro or equivalent	
	Quantity: 1	
	Weight	Mavic 3 Pro: <1000 g
	Camera:	Hasselblad Camera: 4/3 CMOS, Effective Pixels: 20 MP Medium Tele Camera: 1/1.3" CMOS, Effective Pixels: 48 MP Tele Camera: 1/2" CMOS, Effective Pixels: 12 MP
	Flight Time	Greater than 40 minutes maximum Max Flight Distance greater than 25 km
	Video Transmission	Protocol: O3+ or equivalent or better Range: 15km or better Rate:1080p/60fps Transmission* or better
	Drone position	Omnidirectional binocular vision system
	Internal storage	8 GB or better
	Hybrid zoom tele camera	28x Zoom

S. No.	Lot 4: Field Robotics Lab	
1	Unmanned ground vehicle: [Segway RMPLite 220 or equivalent] Quantity: 1	
	Dimensions	L*W*H (mm): 730*499*280
	Structure	Axil base*Wheelbase*Ground
	Parameters	clearance (mm): 513.5*413*69
	Tire size	11 inches (280mm) Hub motor
	Weight	33KG
	Standard Load	50kg
	Obstacle Avoidance	5cm/8°/Speed bump
	Suspension Travel	4mm (Rear)
	Drive	FWD, Differential Steering
	IP Rating	IP65
	Max Speed	3m/s
	Max Steering Speed	3rad/s
	Minimum Turning Radius	0m
	Braking	With No Load: 3m/s 0.9m, Braking Acc: 0.5g
	Control	Remote control, host computer control
	Braking Method	Electronic Brake
	Interface	UART, CAN
	Supporting system, API	C/C++, ROS
	Feedback Data	Encoder, Hall, IMU
	3D Model	Gazebo, Rviz model
	Battery	Range: 1152wh- Max Load:3m/s, Range:80Km Capacity: 48V 20Ah/24Ah Charging: Manual charging/Swappable battery/ Provided with automatic charging interface Host computer power: 48V 400W
	Buttons	Emergency stop button Push to move button Power button
	Status Indication	Power on/off status indicator Platform base status indicator Controls indication Battery level indicator Charging status indicator
	Extension Kits	Must have provision for adding following Light Strip Infrared Sensor Ultrasonic Sensor Bumper Sensor Mounting Rod
2	Modern Manipulator Arm QArm – Quanser or Equivalent Quantity: 1	
	Manipulator weight	8.25 kg
	Payload	350 - 750 g
	Reach	750 mm
	Repeatability	± 0.05 mm
	Camera	Camera Intel® RealSense™ D415
	Interface	USB (QFLEX 2)
	Control	Internal control modes Position mode, Current mode External control rate 500 Hz Internal control rate(min) 1000 Hz
	Expandable I/O	PWM/Analog/I2C/SPI/UART

	Maximum joint speed	$\pm 90^\circ/\text{s}$
	Minimum and maximum joint range	Base: $\pm 170^\circ$
		Shoulder: $\pm 85^\circ$
		Elbow: $-95^\circ/+75^\circ$
		Wrist: $\pm 160^\circ$

S. No.	Lot 5: IoT, Sensors and IT Equipment	
1	Arduino Edge Control Qty: 10	
	Microcontroller	nRF52840 (64 MHz Arm® Cortex-M4F)
	Digital Input	6x edge sensitive wake up pins
	Digital Output	8x latching relay command outputs with drivers 8x latching relay command outputs without drivers
	Relays	4x 60V/2.5A galvanically isolated solid-state relays
	Analog Input	4x 4-20mA inputs 8x 0-5V analog inputs 16x hydrostatic watermark sensor input
	Terminal Block Connectors	6x 18 pin plug in terminal block connectors
	Power Supply	12 V Acid/lead SLA Battery Supply (Recharged via solar panels)
	Power Consumption	Low power (up to 34 months on a 12V/5Ah battery) 200uA Sleep current
	Memory	1 MB onboard Flash memory 2 MB onboard QSPI Flash memory
	Sd Card	Interface for SD Card connector (through expansion port only)
	Connectivity	Bluetooth Wifi* 3G*NB-IoT* LoRaWAN** * Requires Arduino MKR board
	Peripherals	Full-speed 12 Mbps USB Arm CryptoCell CC310 security subsystem QSPI/SPI/TWI/I ² S/PDM/QDEC High speed 32 MHz SPI Quad SPI interface 32 MHz 12-bit 200 ksps ADC 128 bit AES/ECB/CCM/AAR co-processor
	Operational Temperature	-40° C to +85° C (-40° F to 185°F)
2	Arduino Explore IoT Kit Qty: 10	
	<p>Official Arduino Explore Kit Must come with official box Must include Access to an online platform with all the content, information, and activities to learn the basics of IoT in one place Must include 10 step-by-step hands-on activities, covering the fundamentals of IoT: Hardware, Networking, Algorithms and programming, Security, Data handling Must include Access to Arduino Cloud, an integrated online platform that enables to write code, access content, configure boards, and share projects. A free trial to the Arduino Cloud Maker Plan. with access to additional features.</p>	
	1 x Arduino MKR1010	
	<p>MKR IoT Carrier designed for this kit, including:</p> <ol style="list-style-type: none"> 1. Two 24 V relays 2. SD card holder 3. Five Tactile buttons 4. Plug and play connectors for different sensors 5. Temperature sensor 6. Humidity sensor 7. Pressure sensor 8. UV sensor 	

	9. Accelerometer 10. RGB 1.20" display 11. 18650 Li-Ion rechargeable battery holder 12. Five RGB LEDs 1 x Micro USB cable 1 x Moisture sensor 1 x PIR sensor Plug-and-play cables for all the sensors	
3	EMoRo 2560 Controller	
	Qty: 10	
	Microcontroller	ATmega2560
	Operating Voltage	5 V
	Input Voltage (Recommended)	7-14 V
	Input Voltage (Limit)	6-18 V
	Digital I/O Pins	40 => (16 with LEDs + 8 ADC + 8 Servo motor (PWM) + 8 General Purpose)
	PWM Digital I/O Pins	6
	Flash Memory	256 KB (ATmega2560)
	Flash Memory for Bootloader	8 KB
	SRAM	8 KB (ATmega2560)
	EEPROM	4 KB (ATmega2560)
	Clock Speed	16 MHz
	Analog Input Ports (ADC)	8
4	ARDUINO UNO WiFi REV2	
	Qty: 10	
	Microcontroller	ATmega4809
	Operating Voltage	5V
	Input Voltage (Recommended)	7 - 12V
	Digital I/O Pins	14 — 5 Provide PWM Output
	PWM Digital I/O Pins	5
	Analog Input Pins	6
	DC Current Per I/O Pin	20 mA
	DC Current For 3.3v Pin	50 mA
	Flash Memory	48 KB (ATmega4809)
	SRAM	6,144 Bytes (ATmega4809)
	EEPROM	256 Bytes (ATmega4809)
	Clock Speed	16 MHz
	Radio Module	u-blox NINA-W102 (datasheet)
	Secure Element	ATECC608A (datasheet)
	Inertial Measurement Unit	LSM6DS3TR (datasheet)
	Led_Builtin	25
5	USB 2.0 Cable Type A/B	
	Qty: 20	
	Compatible with Arduino Uno, Arduino Mega 2560, Arduino 101 or any board with the USB female A port.	
	Cable length: ~180 cm.	

6	Soldering Stand : QuadHands Classic Helping Hands Tool Qty: 2	
	Soldering Stand	
	Four all-metal flexible gooseneck helping hands	
	Heavy 8" by 8" powder coated solid steel base	
	Stainless steel alligator clamps can be rotated 360 degrees then "locked" into place with knurled thumb nuts.	
7	High Precision Barometric Pressure Sensor Grove(DPS310) or equivalent Qty: 10	
	Based on DPS310 or equivalent Must measure air pressure change caused by height changes in the centimeter level	
8	Gravity: UART Infrared CO2 Sensor (0-5000ppm) Qty: 1	
	Operation Voltage	4.5~5.5V
	Output	Gravity: UART (0~3.3V Level)
	Measurement Principle	NDIR (non-dispersive infrared)
	Measurement Range	0~50000 ppm
	Accuracy	±(100ppm + 6% readings)
	Response Time	<30s
	Average Power	<430mW@5V
	Operation Temperature	0°C~50°C
	Operation Humidity	0~95% RH (No condensation)
	Lifespan	>5 years
	Dimension (PCB)	21*27.1 mm
	Features	1.High Accuracy 2.Large Range 3.Long Lifespan 4.Auto Temperature Compensation 5.Water Vapor Interference Resistance 6.3.3V UART Output
9	Grove - Gas Sensor (MQ3) Qty: 10	
	Must be suitable for detecting Alcohol, Benzine, CH4, Hexane, LPG, CO. The sensitivity of the sensor can be adjusted by using the potentiometer.	
10	Gravity: Analog CO2 Gas Sensor (MG-811 Sensor) Qty: 10	
	Must be based on SMG-811 sensor module (highly sensitive to CO2 and less sensitive to alcohol and CO, low humidity & temperature dependency.) Operating Voltage:5V Interface: Gravity Analog One digital output High-quality connector Immersion gold surface Onboard heating circuit	
11	Gravity: Analog Capacitive Soil Moisture Sensor - Corrosion Resistant Qty: 30	
	Must be made of corrosion resistant material Must have On-board voltage regulator Operating voltage range: 3.3 ~ 5.5V. I Must be compatible with MCUs (both 3.3V and 5V logic)	

12	Digital Infrared Temperature Sensor (Grove or equivalent) Qty: 10
	<p>Non-contact temperature measurement Based on MLX90615. Must contain IR sensitive thermopile detector chip and the signal conditioning chip in the same package. Communication with Arduino using SMBus Up to 127 sensors can be read via common 2 wires. 16-bit ADC Accuracy of 1°C over wide temperature range and a high measurement resolution of 0.02°C. - 40 to 85°C for sensor temperature - 40 to 115°C for object temperature</p>
13	Multi-function Environmental Module - CCS811+BME280 Qty: 10
	<p>Multi-function environment sensor Based on the combination of CCS811+BME280 chip I2C interface Must be able to detect temperature, humidity, barometric pressure, altitude, TVOC, and eCO₂. ±0.5°C temperature error ±2%RH humidity error Offset temperature coefficient: ±1.5 Pa/K, equiv. to ±12.6 cm at 1 °C temperature change.</p>
14	Gravity: Non-contact Digital Water / Liquid Level Sensor For Arduino Qty: 20
	<p>Non-contact water / liquid level sensor for Arduino Chip: (XKC-Y25-T12V)</p>
15	Air Quality Sensor (CCS811 DFRobot or equivalent) Qty: 20
	<p>Must be able to measure the eCO₂ (equivalent CO₂) and TVOC (Total Volatile Organic Compounds) density. Must use AMS's unique micro-hot plate technology or equivalent Must have Internally integrated ADCs and MCUs allow data to be collected, calculated, and returned via I2C. Must support a concentration alarm, which is triggered when the concentration exceeds the threshold. Must support multiple modes Must have sleep mode</p>
16	Water Sensor (Grove or equivalent) Qty: 20
	<p>Grove compatible interface Low power consumption ~ 2.0cm x 2.0cm High sensitivity Working Voltage: 4.75-5.25 V Current <20mA Working Humidity (Without Condensation) 10-90 % Must come with the interface wire pack</p>
17	Temperature Sensor (Grove or equivalent) Qty: 20
	<p>Voltage: 3.3 ~ 5V Zero power resistance: 100 KΩ Resistance Tolerance: ±1%20 Operating temperature range: -40 ~ +125 °C Nominal B-Constant: 4250 ~ 4299K Must come with the interface wire pack</p>

18	Temp & Humidity & Barometer Sensor (BME280 Grove or equivalent) Qty: 10	
	Input Voltage	3.3V or 5V
	I/O Voltage	3.3V or 5V
	Operating Current	0.4mA
	Operating Temperature	-40 - 85 °C
	Atmospheric Pressure Sensor Measurement Range	300 - 1100 hPa (1 hPa= one hundred Pa) with ±1.0 hPa accuracy
	Temperature Sensor Measurement Range	-40 - 85 °C, with ±1.0°C accuracy
	Humidity Sensor Measurements Range	0% - 100% relative humidity , with ±3% accuracy
	Measurement Modes	Piezo & Temperature, forced or periodic
	Chip	BME280(datasheet)
	Interface Bus	SPI, I2C (use either one of them)
	Weight	3.2 g (for breakout board), 9.3 g for whole package each piece
	Dimensions	40 (length) × 20 (width) mm
	Parameter	Value
	Input Voltage	3.3V or 5V
	I/O Voltage	3.3V or 5V
	Operating Current	0.4mA
	Operating Temperature	-40 - 85 °C
	Atmospheric Pressure Sensor Measurement Range	300 - 1100 hPa (1 hPa= one hundred Pa) with ±1.0 hPa accuracy
	Temperature Sensor Measurement Range	-40 - 85 °C, with ±1.0°C accuracy
	Humidity Sensor Measurements Range	0% - 100% relative humidity , with ±3% accuracy
19	Moisture Sensor (Grove or equivalent) Qty: 20	
	Dimensions	60mm x20mm x6.35mm
	Weight	G.W 10g
	Battery	Exclude
	Operating voltage	3.3~5V
	Operating current	35mA
	Sensor Output Value in dry soil	0~ 300
	Sensor Output Value in humid soil	300~700
	Sensor Output Value in water	700 ~ 950
20	Hall Sensor (Grove or equivalent) Qty: 10	
	400ns transition period for rise and fall.	
21	Analog pH Sensor / Meter Pro Kit For Arduino (Gravity or equivalent) Qty: 10	
	Professional pH Sensor Meter Kit with industrial electrode. Life (up to 1 year) Module Power : 5.00V Measuring Range :0-14PH Measuring Temperature :0-60 °C	

	<p>Accuracy : $\pm 0.1\text{pH}$ (25 °C) Response Time : $\leq 1\text{min}$ Industry pH Electrode with BNC Connector PH2.0 Interface (3 foot patch) Gain Adjustment Potentiometer Power Indicator LED Kit must contain the following: Industry pH electrode (BNC connector) x1 pH sensor circuit board x1 Analog cable x1</p>																																				
22	<p>Ozone Sensor (0-10ppm) (Gravity or equivalent) Qty: 10</p>																																				
	<p>Detection Gas: Ozone Working Voltage: 3.3 ~ 5.5V DC Interface: Gravity-4Pin Output Signal: I2C output Measuring Range: 0 ~ 10ppm Resolution: 0.01ppm (10ppb) Warm-up Time: ≤ 3 minutes Response Time: ≤ 90 seconds Recovery Time: ≤ 90 seconds Working Temperature: -20 ~ 50 °C Operating Humidity: 15 ~ 95% RH (non-condensing) Storage Temperature: -20 ~ 50 °C Life: > 2 years (in air)</p>																																				
23	<p>SOIL HUMIDITY SENSOR, WATERMARK 2 M / 75 CM (Pack of 6) Qty: 10</p>																																				
	<p>Range 0 – 239 cbars, Frost resistant Watermark sensors must be glued/riveted on a semi-tender PVC tube that is re-molded back in 2 diameters 25/22 mm</p>																																				
24	<p>Arduino Nano 33 IoT with headers Qty: 10</p>																																				
	<table border="1"> <tr> <td>Microcontroller</td> <td>SAMD21 Cortex®-M0+ 32bit low power ARM MCU</td> </tr> <tr> <td>Radio module</td> <td>u-blox NINA-W102</td> </tr> <tr> <td>Secure element</td> <td>ATECC608A</td> </tr> <tr> <td>Operating voltage</td> <td>3.3V</td> </tr> <tr> <td>Input voltage (limit)</td> <td>21V</td> </tr> <tr> <td>DC Current Per I/O Pin</td> <td>7 mA</td> </tr> <tr> <td>Clock Speed</td> <td>48MHz</td> </tr> <tr> <td>CPU Flash Memory</td> <td>256KB</td> </tr> <tr> <td>SRAM</td> <td>32KB</td> </tr> <tr> <td>EEPROM</td> <td>none</td> </tr> <tr> <td>Digital Input / Output Pins</td> <td>14</td> </tr> <tr> <td>PWM PINS</td> <td>11 (2, 3, 5, 6, 9, 10, 11, 12, 16 / A2, 17 / A3, 19 / A5)</td> </tr> <tr> <td>UART</td> <td>1</td> </tr> <tr> <td>SPI</td> <td>1</td> </tr> <tr> <td>I2C</td> <td>1</td> </tr> <tr> <td>Analog input pins</td> <td>8 (ADC 8/10/12 bit)</td> </tr> <tr> <td>Analog output pins</td> <td>1 (DAC 10 bit)</td> </tr> <tr> <td>External interrupts</td> <td>All digital pins (all analog pins can also be used as interrupt pins,</td> </tr> </table>	Microcontroller	SAMD21 Cortex®-M0+ 32bit low power ARM MCU	Radio module	u-blox NINA-W102	Secure element	ATECC608A	Operating voltage	3.3V	Input voltage (limit)	21V	DC Current Per I/O Pin	7 mA	Clock Speed	48MHz	CPU Flash Memory	256KB	SRAM	32KB	EEPROM	none	Digital Input / Output Pins	14	PWM PINS	11 (2, 3, 5, 6, 9, 10, 11, 12, 16 / A2, 17 / A3, 19 / A5)	UART	1	SPI	1	I2C	1	Analog input pins	8 (ADC 8/10/12 bit)	Analog output pins	1 (DAC 10 bit)	External interrupts	All digital pins (all analog pins can also be used as interrupt pins,
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		but will have duplicated interrupt numbers)
	Led Built-in	13
	USB	Native in the SAMD21 Processor
	IMU	LSM6DS3
25	WiFi Module - ESP8266 (4MB Flash) Qty: 20	
	802.11 b/g/n Wi-Fi Direct (P2P), soft-AP Integrated TCP/IP protocol stack Integrated TR switch, balun, LNA, power amplifier and matching network Integrated PLLs, regulators, DCXO and power management units +19.5dBm output power in 802.11b mode Power down leakage current of <10uA 4MB Flash Memory Integrated low power 32-bit CPU SDIO 1.1 / 2.0, SPI, UART STBC, 1x1 MIMO, 2x1 MIMO A-MPDU & A-MSDU aggregation & 0.4ms guard interval Wake up and transmit packets in < 2ms Standby power consumption of < 1.0mW (DTIM3) Soldered Headers	
26	ESP-01S Wifi Module with relay or equivalent Qty: 20	
	Supply Voltage: DC 5V Relay load capacity: 10A 250VAC ,10A 125VAC, 10A 30VDC, 10A 28VDC	
27	Fingerprint Sensor Module (Adafruit or equivalent) Qty: 10	
	Supply voltage: 3.6 - 6.0VDC Operating current: 120mA max Peak current: 150mA max Fingerprint imaging time: <1.0 seconds Window area: 14mm x 18mm Signature file: 256 bytes Template file: 512 bytes Storage capacity: 162 templates Safety ratings (1-5 low to high safety) False Acceptance Rate: <0.001% (Security level 3) False Reject Rate: <1.0% (Security level 3) Interface: TTL Serial Baud rate: 9600, 19200, 28800, 38400, 57600 (default is 57600) Working temperature rating: -20C to +50C Working humidity: 40%-85% RH	
28	Adafruit DS1307 Real Time Clock Assembled Breakout Board Qty: 10	
	RTC: DS1307 Breakout board with headers Battery cell must be included	
29	DS3231 Precision RTC Breakout (Adafruit or equivalent) Qty: 5	
	RTC: DS3231 Breakout board with headers Battery cell must be included	
30	MicroSD card breakout board+(Adafruit or equivalent) Qty: 10	
	Onboard 5v->3v regulator able to provide up to 150mA for power-hungry cards	

	<p>3v/5v level shifting Activity LED lights up when the SD card is being read or written Compatible with Arduino</p>
31	<p>HDMI Cables for Raspberry Pi 4 B+ (Micro HDMI to HDMI) Qty: 30</p>
	<p>HDMI A (Standard) to HDMI D (micro) 19-pin HDMI Type D(M) to 19-pin HDMI Type A(M) Nickel-plated plugs 4Kp60 compliant RoHS compliant 3Mohm 300VDC insulation withstands 300VDC for 0.1s Compliant with HDMI high-speed cable standards Must support both audio and video Must support Ethernet and Audio Return Channel (CEC)</p>
32	<p>Hot Air Soldering Rework Station w/ Three Nozzles – Quick 957DW+ Qty: 2</p>
	<p>Closed-loop temperature control range between 100-450°C Digital display Intelligent cooling system so the airflow remains on until it gets to below 100°C. Max air flow is 100L/minute Technical Details Rework Station: 180mm x 99mm x 145mm / 7.1" x 3.9" x 5.7" Hose Length: 105 cm / 41.5" Weight: 1588g / 3.5lbs 120VAC – 580 Watts Outer Diameters of Three Nozzles: 3mm / 0.12" 6.4mm / 0.25" 8.4mm / 0.33"</p>
33	<p>Engineer Professional Silicone-Tip Solder Sucker Qty: 2</p>
	<p>Dimensions: 8.1 x 3.4 x 0.7 inches Weight: 52g Cylinder Capacity: 9cc</p>
34	<p>ATTEN 80W 110V Soldering Iron With Station - ST-2090D Qty: 6</p>
	<p>80 Watt-powerful stationary soldering iron Power Voltage: 110V AC / 60Hz Power Consumption: 80W Temperature Range: 80 ~ 480°C / 176 ~ 896°F</p>
35	<p>128 GB Extreme microSDHC UHS-I Memory Card with Adapter or equivalent Qty: 40</p>
	<p>Class: 10 Up to 160MB/s read speeds to save time transferring high-res images and 4K UHD videos Up to 60MB/s write speeds for fast shooting. 4K UHD and Full HD-ready with UHS Speed Class 3 (U3) and Video Speed Class 30 (V30)(5) Rated A2 for faster loading and in-app performance Built for and tested in harsh conditions: temperature-proof, water-proof, shock-proof and x-ray proof</p>
36	<p>Wire Stripper Qty: 2</p>
	<p>Standard for jumper wires</p>

37	Breadboard power supply Qty: 10
	5V 3V
38	Vero board Qty: 20
	Different standard sizes Breadboard size, 2x breadboard size
39	Magnifying glass for soldering Qty: 5
	3 kinds of magnifying lens: 2.5X 90mm (diameter), 7.5X 34mm, 10X 34mm. Independent bright illuminating light with 5 pcs of LEDs. Base surface: steel sheet. Lens diameter: 90mm & 34mm Power: external power or 3 * AA Battery (not included) Power adapter: Input 110-240V 50/60Hz, Output: DC 4.8V 250mA Welding holder size: length 6.3cm/2.48in, Diameter 2.7cm & 1.8cm/ 1.06in 0.71in Base size: 10 * 6.8cm / 3.94 * 2.68in (L * W)
40	Breadboard Qty: 20
	2 Distribution Strips, 200 tie-points 630 tie-points in IC/ circuit areas ABS plastic with color legend Dimension: 6.5*4.4*0.3 inch Hole/Pitch Style: Square wire holes (2.54mm) ABS heat Distortion Temperature: 84° C (183° F) Rating: 300/3 to 5Amps Insulation Resistance: 500MΩ / DC500V Withstanding Voltage: 1,000V AC / 1 minute Insertion Wire Size: 21 to 26 AWG wire
41	RAM - 16GB DDR4 3200MHz SODIMM PC4-25600 Qty: 12
	Speed: PC4-25600 (3200 MHz) Memory Type: DDR4
42	SATA 2.5" SSD 512GB for laptops Qty: 10
	Contents: SATA III Solid State Drive Capacity:512GB
43	Keyboards Qty: 30
	Logitech MK850 performance wireless Keyboard and Mouse set

Lot 6	Embedded Systems
1	WiFi LoRa 32 Dev Board (Heltec or equivalent) Qty: 10
	<p>Processor: Tensilica LX6 dual-core processor, clocked at 240MHz, computing power up to 600DMIPS, SRAM: chip built-in 520 KB SRAM Wi-Fi: ESP32 series 802.11b/g/n HT40 Wi-Fi transceiver, baseband, protocol stack and LWIP Integrated dual-mode Bluetooth (traditional Bluetooth and BLE low power Bluetooth). Lora: SX1276 chip, 868/915MHz frequency, -139dBm high sensitivity, +20 dBm power output, high reliability, transmission distance (measured open area communication distance 2.8Km). Onboard 32MByte Flash 0.96-inch blue OLED display Lithium battery charging circuit and interface CP2102 USB to serial chip Operating voltage: 3.3V to 7V Operating temperature range: -40 ° C to + 90 ° C Supports Sniffer, Station, softAP and Wi-Fi Direct modes Data rate: 150 Mbps 11n HT40,72 Mbps 11n HT20,54 Mbps 11g, 11 Mbps 11b Transmit power: 19.5 dBm 11b, 16.5 dBm 11g, 15.5 dBm 11n Receiver sensitivity up to - 139 dBm UDP continues to throughput by 135 Mbps Antenna Specifications: Connector type: ipex Band definition: 868-915MHz Standing wave ratio: ≤ 1.5 Gain: 3dBi Maximum power: 10W Input impedance: 50Ω Package must include 1 * ESP32 Development Board with OLED 1 * 868/915MHz Antenna 1 * Pin sticker 2 * Pin headers</p>
2	LoRa Test Board Kit (LLCC68 based E220-900T30S or equivalent) Qty: 2
	<p>For testing the EBYTE E220-900T30S Lora Transceiver All pins of E220-900T30S module have been led out Pre-welded E220-900T30S Must be Equipped with USB interface, can be directly plugged into the computer to use Working Frequency: 850.125-930.125MHz IC: LLCC68 or equivalent Module Size: 80*45mm Operating Voltage: 3.3-5.5V Power: 30dBm Receiving Sensitivity: -129dBm Antenna must be included</p>
3	LoRa LLCC68 Development Kit 430 MHz 470 MHz Qty: 2
	<p>For testing the EBYTE E220-400T30S Lora Transceiver All pins of E220-400T30S module have been led out Pre-welded E220-400T30S Must be Equipped with USB interface, can be directly plugged into the computer to use Working Frequency: 430Mhz-470Mhz IC: LLCC68 or equivalent Module Size: 80*45mm</p>

	<p>Operating Voltage: 3.3-5.5V Power: 30dBm Receiving Sensitivity: -129dBm Antenna must be included Must include USB power supply cable</p>
4	<p>LLCC68 LoRa Module 868MHz 915MHz 30dBm UART Qty: 10</p>
	<p>Certification: CE, FCC, RoHS Working Frequency: 868MHz 915MHz Model Number: E220-900T30D IC: LLCC68 Working Frequency: 850.125~930.125MHz Power: 30dBm Distance: 10km Size: 24*43mm Communication Distance: UART Package Type: DIP Antenna Type: SMA-K</p>
5	<p>LLCC68 LoRa Module 433MHz 470MHz 30dBm UART Qty: 10</p>
	<p>Certification: CE, FCC, RoHS Origin: CN(Origin) Working Frequency: 433MHz Model Number: E220-400T30D IC: LLCC68 Working Frequency: 410.125~493.125MHz Power: 30dBm Distance: 10km Size: 24*43mm Antenna Type: SMA-K Communication Distance: UART</p>
6	<p>Antenna for LLCC68 LoRa Module 868MHz 915MHz 30dBm UART Qty: 10</p>
	<p>Antenna compatible with item specs (S. No. 69)</p>
7	<p>DE1-SoC Development Kit including cables and power adapter Qty: 2</p>
	<p>Detailed Specs: Cyclone V SoC FPGA 5CSEMA5F31 with EPCQ256 256-Mbit serial configuration device ARM* Cortex-A9 dual core (925 MHz) Nios® II processor</p>
8	<p>DE10-Lite Qty: 10</p>
	<p>Intel® MAX® 10 FPGA 10M50DAF484C7G with integrated dual ADCs. Each ADC supports one dedicated analog input and eight dual function pins Nios II processor</p>
9	<p>Super Value Ultimate 37 in 1 Sensor Modules Kit for Arduino & MCU Qty: 08</p>
	<p>1 x Small passive buzzer module KY-006 – 1 x 2-color LED module KY-011 1 x Hit sensor module KY-031 1 x Vibration switch module KY-002 1 x Photo resistor module KY-018 1 x Key switch module KY-004 1 x Tilt switch module KY-020 1 x 3-color full-color LED SMD modules KY-009</p>

	1 x Infrared emission sensor module KY-005 1 x 3-color LED module KY-016 1 x Mercury open optical module KY-017 1 x Yin Yi 2-color LED module 3MM KY-029 1 x Active buzzer module KY-012 1 x Temperature sensor module KY-013 1 x Automatic flashing colorful LED module KY-034 1 x Mini magnetic reed modules KY-021 1 x Hall magnetic sensor module KY-003 1 x Infrared sensor receiver module KY-022 1 x Class Bihor magnetic sensor KY-035 1 x Magic light cup module KY-027 1 x Rotary encoder module KY-040 1 x Optical broken module KY-010 1 x Detect the heartbeat module KY-039 1 x Reed module KY-025 1 x Obstacle avoidance sensor module KY-032 1 x Hunt sensor module KY-033 1 x Microphone sound sensor module KY-038 1 x Laser sensor module KY-008 1 x 5V relay module KY-019 1 x Temperature sensor module KY-001 1 x Temperature sensor module KY-028 1 x Linear magnetic Hall sensors KY-024 1 x Flame sensor module KY-026 1 x Sensitive microphone sensor module KY-037 1 x Temperature and humidity sensor module KY-015 1 x XY-axis joystick module KY-023 1 x Metal touch sensor module KY-036 1 x Arduino 37 Sensor Kit 1 x Organizer Case
10	ZedBoard Zynq-7000 ARM/FPGA SoC Development Board Qty: 08
	ZedBoard APSoC development board 12 V AC/DC power supply 4 GB SD Card USB A to micro-B cable USB Adapter: Male Micro-B to Female Standard-A
11	PYNQ-Z1: Python Productivity for Zynq-7000 ARM/FPGA SoC with Accessory Kit Qty: 08
	PYNQ-Z1 with Accessory Kit including microSD card Ethernet cable micro USB power supply
12	Eclipse Z7: Zynq-7000 SoC Development Board with SYZYGY-compatible Expansion Qty: 1
	Eclipse Z7 bundled with a Zmod AWG 1411 and Zmod Scope 1410-105
13	ZedBoard Advanced Image Processing Kit (Quad Pcam option) Qty: 5
	4 Pcam 5Cs 10 cm ribbon cable FMC Pcam Adapter
14	ZU-5EV (Zynq Ultrascale+ MPSoC Development Board) Qty: 1
	XCZU5EV-SFVC784-1-E (with heat sink and fan)

	<p>4 GiB DDR4 SODIMM module Multimedia: 1.2a dual-lane display port 2x Pcam dual-lane Audio codec H.264/H.265 HDMI Network connectivity: 2.4 GHz onboard Wi-Fi Ethernet SIM card slot WLAN/WWAN/LoRa option: MiniPCIe Expansion: 1x FMC expansion connector 1x FMC gigabit 1x SYZYGY port 4x Pmod ports</p>
15	<p>Xilinx Virtex-7 FPGA VC707 Evaluation Kit Qty: 1</p>
	<p>VC707 evaluation board with the Virtex-7 XC7VX485T2FFG1761CES FPGA Full-seat ISE Design Suite Logic Edition, device-locked for the Virtex-7 XC7VX485T-2FFG1761CES FPGA</p>
16	<p>Universal Programmer (Xeltek Superpro 610p or equivalent) Qty: 5</p>
	<p>Must have support for ~34000 ICs from ~250 manufacturers Must have In-system programming (ISP / ICP) capability. Must have Programming / testing features for TTL/CMOS logic ICs and memories. Must Support devices with Vcc from 1.2V to 5V. Must be Built with 48 universal pin-drivers. Must have PC hosted mode Must support only IC manufacturer approved programming algorithms. Must have the support for processes such as device selection, file loading, device configuration setting, program option, and batch file setting into one touch step. Must have the support to set Password for project files and production volume control Must have Batch command for device operations like program, verify, security into a single command at any sequence. Must have Serial numbers generators as standard or customer-specific functions. Must generate a Log file. Over-current and over-voltage protection for safety of the chip and programmer hardware. WINDOWS XP/Vista compatibility/Win7/Win10 Supported devices: EPROM, Paged EPROM, Parallel and Serial EEPROM, BPROM, NVRAM, SPLD, CPLD, EPLD, Firmware HUB, Microcontroller, MCU. Packages supported: DIP, SDIP, PLCC, JLCC, SOIC, QFP, TQFP, PQFP, VQFP, TSOP, SOP, TSOPII, PSOP, TSSOP, SON, CSP, SCS. PC interface: USB2.0 Electrical spec. of the AC adapter: AC 100-240V, output 12V/2A; power:15W Contents: USB Interfaced Universal Programmer (Xeltek SuperPro 610P or equivalent) AC Power Adapter USB Cable CD with Software User Manual</p>
17	<p>Zigbee module with antenna (XBee S2C ZigBee (Wire Antenna) or equivalent) Qty: 10</p>
	<p>SPECIFICATION Interoperable with other ZigBee compliant devices* Must support binding and multicasting, for easy integration into a Home Automation platform. 15 general-purpose I/O lines Link budgets of 110 dB for XBee</p>

sleep current of sub 1uA
Firmware upgrades via UART, SPI or over the air
Data Rate: RF 250 Kbps, Serial up to 1 Mbps
Indoor/Urban Range: 200ft (60m)
Outdoor/RF Line-of-Sight Range: 4000ft (1200m)
Transmit Power: 3.1mW
Receiver Sensitivity: -100dBm
Serial Data Interface: UART, SPI
Configuration Method: API or AT command, local or over-the-air
Frequency Band: ISM 2.4GHz
Form Factor: Through-Hole, Surface Mount
Interference Immunity: DSSS (Direct Sequence Spread Spectrum)
ADC Inputs: (4) 10-bit ADC inputs
Digital I/O: 15
Antenna: Integrated Wire

Lot No. 7: Chairs for Labs	
1	Chairs QTY: 40
<p>Office Chair (Ergonomic Desk Chair Mesh Computer Chair).</p> <p>Material: Fabric Padded Seat Base: Nylon Arms: Polyurethane (PU)</p> <ul style="list-style-type: none"> Mesh back: breathable mesh back provides ventilation while seated Built-in Lumbar support Tilt Mechanism: torsion bar basic tilting mechanism Nylon Base: durable nylon base with castor wheels for 360° rotation Height Adjustable: gas lift mechanism <p>Color: Black</p>	

Lot No. 8: Intelligent Biomedical Lab		
1	BIOPAC (Data Acquisition System for Biomedical Engineering) Quantity: 01	
Power:	Data Acquisition Unit with USB Cable, DC Adapter (110V/60Hz or 220V/50Hz) & Cord (Hospital Grade) Technical Specification of the Data Acquisition Unit	
Number of Channels:	Isolated human-safe universal input amplifiers: 4 Channels	
A/D Sampling Resolution:	24-bit	
Gain Ranges:	5x to 50,000x (13 steps)	
Input Voltage Range:	Adjustable from $\pm 200 \mu\text{V}$ to $\pm 2 \text{ V}$	
Signal-to-Noise Ratio	> 89 dB min	
Input Noise Voltage:	0.1 μV rms noise (0.1 Hz to 35 Hz) – nominal	
Input Noise Current:	2.1 pA rms (0.1 Hz to 10 Hz) - nominal	
CMRR:	85 dB minimum	
Software Filters:	Three programmable digital (IIR) filters; automatic or user-adjustable	
Hardware Filters:	Low pass – 20 KHz	
	High pass – DC, 0.05 Hz, 0.5 Hz, 5 Hz	
Channel-to-Channel Latency:	None: Channels are sampled simultaneously	
Analog Output	$\pm 0.5 \text{ V}$ output Headphone jack 3.5 mm stereo jack connection	
Sample Rate:	100,000 samples/sec each channel	
Serial Interface Type:	USB 2.0 full speed	
Certification:	Complies with IEC 60601-1 EMC complies with IEC 60601-1-2 CE Marked	
Analog Output:	Back panel DUSB 9m labeled “Analog Out”	
Voltage Output:	Range -10 V to +10 V Resolution: 16-bits	
Pulse Output:	variable, 50 μsec – 100 msec	
Width:		
Repetition:	variable. 100 μsec – 5 seconds	
Pulse Level:	Adjustable from -10 V to +10 V With BSLSTMB Stimulator: 0 – 100 V	
Electrode Check:	Impedance Range 0-1 M Ω (Checks Impedance between Vin+ and GND, Vin- and GND) Input Triggering Options	
External Trigger:	Back panel BNC labeled “Trigger” TTL positive or negative edge	
Analog Trigger:	Any Input channel (front panel “CH1 – CH4”)	
Digital Trigger:	Any of the eight input lines (back panel DSUB 25m)	
Accessories		
2 x Electrode Lead Sets –		
Disposable Electrodes (100/pk) –		
Abrasive Pads (10/pk) –		
Hand Dynamometer –		
BP Cuff Transducer –		
Electronic Stethoscope Transducer –		
Air Flow Transducer, factory-calibrated –		
Disposable Filtered Mouthpieces (10/pk) –		

	Disposable Noseclips (10/pk) –
	Hand Switch –
	Headphones –
	Pulse Transducer –
	Signal Processing Breadboard Kit –
	Breadboard Accessories –
	breadboard interface –
	Electronic Breadboard Probe –
	exercise physiology & biomechanics
	Development Kit:
	<u>Exercise Physiology & Biomechanics Kit:</u>
	Features:
	· ECG, EEG, EMG, EOG & EGG
	· Respiration
	· Temperature
	· Airflow & Lung Volume
	· Cardiac Output (via bioimpedance)
	· Respiratory Exchange Ratio
	· Basal or Resting Metabolic Rate
	· Motor Unit Recruitment
	· 12-Lead ECG
	· Heart Sounds
	· Blood Pressure
	· Stroke Volume
	· Gait Analysis (including Heel-Toe Strike)
	· Range of Motion Acceleration, Velocity, Distance
	<u>Biomed Engineering Kit:</u>
	Features:
	· Signal Analysis & Processing
	· ECG, EDA (GSR), EEG, EGG, EMG & EOG
	· Force, Pressure, Strain, Flow, Temperature, Sound, Light
	· Filters (FIR & IIR)
	· Instrumentation Design
	· Respiratory System & Pulmonary Function
	· Bioimpedance (Cardiac Output & Blood Flow)
	· Biomechanics—Angle, Acceleration, Distance, Velocity
	· Transducers & Calibration
	· Physiological Control Systems
	· Compartmental Modeling of Blood Pressure & Heart Sounds
	· Gait Analysis Chart, Overlap, Scope & X/Y Displays
	· Spectral Analysis & Histograms
2	Freestyle Libre 2 Reader with Sensor - Continuous Glucose Monitor (Starter Pack) Quantity: 2
	Model FreeStyle Libre 2 Reader with Sensor
	Brand FreeStyle Libre 2 Reader with Sensor
3	Myo gesture control armband Quantity: 2 (white)
	Electrode Eight
	Measurements 9-axes inertial measurement unit
	Transmission module

4	MyoWare 2.0 Muscle Sensor Development Kit Quantity: 2	
	MyoWare 2.0 Muscle Sensor Development Kit With complete sensors and accessories	
	Sparkfun Product ID: 18441	
5	2.2 Inch Flex Sensor Quantity: 20	
	<p>Technical Specification:</p> <ul style="list-style-type: none"> • Resistance in straight state: 25K ohm • Resistance value tolerance: ±30% • Bending resistance change: 60K ~ 110K ohm • Rated power: 0.5 watts • Peak power: 1 watt • Bending life: >1 million times • Working temperature: -35°C ~ +80°C • Length x width: 73.66x6.35mm • Interface type: 2-Pin metal pins (pitch 0.1") 	
6	MySignals HW BLE Complete Kit (eHealth Medical Development Platform for Arduino)	
	Quantity: 1	
	Sensor	Snore, Spirometer, Blood Pressure (BLE), SPO2 (BLE), Glucometer (BLE) and Body Scale (weight, bone mass, body fat, muscle mass, body water, visceral fat, Basal Metabolic Rate and Body Mass Index).
	Architecture	Arduino compatible
	RAM Memory	2K
	Flash Memory	32K
	Screen	TFT (basic graphics)
	Concurrent Sensor Readings	From one group of sensors (analog, UART, BLE) to one interface (TFT, BLE, WiFi)
Radios on board	BLE, WiFi	

Lot No. 9: Computer Vision Lab	
1	Jetson Orin Nano Developer Kit Quantity: 4
	Key Features: Developer Kit Content (P3766) > Jetson Orin Nano™ 8GB module with heat sink and reference carrier board > DC Power Supply > 802.11ac/abgn wireless network interface controller > Quick Start Guide
2	Jetson AGX Orin 64GB Developer Kit Quantity: 4
	Key Features: Jetson AGX Orin 64GB module > 2048-core NVIDIA Ampere architecture GPU with 64GB tensor cores > 12-core Arm® Cortex®-A78AE v8.2 64-bit CPU > 2x NVDLA v2.0 > PVA v2.0 > 64GB 256-bit LPDDR5 > 64GB eMMC 5.1
3	Jetson TX2 NX Module Quantity: 4
	Key Features: > NVIDIA Pascal™ architecture with 256 NVIDIA® CUDA® cores > Dual-core NVIDIA Denver 2 64-bit CPU and quad-core Arm® Cortex®-A57 MPCore processor complex > 4GB 128-bit LPDDR4 > 16GB eMMC 5.1 > 10/100/1000 Base-T Ethernet Power > Voltage Input: 5V > Module Power: 7.5W -15W

Note:

1. PAF-IAST may re-adjust the quantities specified against the specifications of same genre in any of the Lots or increase the quantities as permissible under PPRA Rules.
2. The Bidder shall indicate in their offer,
 - a. detailed specifications of their offered product(s),
 - b. standard accessories,
 - c. make and origin, as part of confirming Compliance as per the format given in Form – D.
3. The Unit Price, Total Bid Price, and Additional Warranty Price of the quoted items shall be indicated as per the given format in Form – G.
4. Bidders are required to provide/attach third party report or assessment in case items are quoted as per the provision of “Equivalent” given in RFP

Section 5b: Special Terms and Conditions

Standard

- The goods supplied must be capable of functioning properly under the climatic conditions of Haripur.
- 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.
- The goods with standard accessories supplied under this tender shall confirm to the standard maintenance in the technical specification.
- Visit to already installed and operational equipment if required as per Section 5, shall be provided within the time specified and unless otherwise specified by the Purchaser, at no expense to the Institute. The PAF-IAST may ask the bidders to carry out testing/analysis of samples (to be provided) to evaluate the performance of already installed and operational unit of similar specifications.

Training

- The firm supplying the item/ equipment(s) will demonstrate the operation/ working of the supplied goods to the satisfaction of PAF- IAST and provide training. Suppliers are advised to provide details on formal training for the LOT(s) covering aspects as mentioned below, but not limited to, as required in Form – E (Section 3).

LOT(s)	
Level	1 to 9
Basic	Demonstrate the operations/ working to end users; Identify the do's and don'ts; and aspects deem necessary for long-life functioning of supplied goods.
Hands-on	Demonstrate technical features; Elaborate technical configuration(s) performed for integration with the overall setup; Documented guidelines for generating reports using software and/ or systems' interface
Advanced	Provide trainings to Operators for troubleshooting and smooth operations using system manuals

- The Bidder shall be responsible for all the necessary training programs available for the operation, maintenance and troubleshooting of the equipment at no additional 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.

Calibration of item/equipment

- The supplier will install the good(s) in the presence and 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

- 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 and additional two (02) years as Extended Warranty 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 PAF: IAST 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.
- 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.
- 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.

Section 6: 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 22.

Bid Proposal:

Have you duly completed all the Returnable Bidding Forms?	
Form A: Bid Submission Form	<input type="checkbox"/>
Form B: Joint Venture/Consortium/ Association Information Form	<input type="checkbox"/>
Form C: Bidder Information Form	<input type="checkbox"/>
Form D: Qualification Form	<input type="checkbox"/>
Form E: Bid Proposal Form	<input type="checkbox"/>
Form F: Specifications Compliance Form	<input type="checkbox"/>
Form G: Price Schedule Form	<input type="checkbox"/>
Have you provided the required documents to establish compliance with the evaluation criteria in Section 4?	<input type="checkbox"/>

Form A: Bid Submission Form

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

Name of Bidder:	[Insert Name of Bidder]	Date:	Select date
ITB reference:	PAF: IAST-AIE-ITB-114-21		

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:

- a) is not under procurement prohibition by any of the Government/ Semi-government/ Autonomous organization;
- b) have not been suspended, debarred, sanctioned or otherwise identified as ineligible by any Organization in Pakistan;
- c) 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;
- d) undertake not to engage in proscribed practices, including but not limited to corruption, fraud, coercion, collusion, obstruction, or any other unethical practice, with the PAF: IAST, and to conduct business in a manner that averts any financial, operational, reputational or other undue risk to the PAF: IAST.

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 PAF-IAST.

We offer to supply the goods and related services in conformity with the Bidding documents, including the PAF-IAST 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 this Bid and bind it should PAF- IAST accept this Bid.

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 Bidder:	[Insert Name of Bidder]	Date:	Select date
ITB reference:	PAF: IAST-AIE-ITB-114-21		

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 awarded, during contract execution)	[Complete]
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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 PAF: IAST for the fulfillment of the provisions of the Contract.

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)

Name of Bidder:	[Insert Name of Bidder]	Date:	Select date
ITB reference:	PAF: IAST-AIE-ITB-114-21		

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]
Are you a PAF: IAST registered vendor?	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, [insert PAF- IAST vendor number]
Countries of operation	[Complete]
No. of full-time employees	[Complete]
No. of Technical Staff	[Complete]
Quality Assurance Certification (e.g. ISO 9000 or Equivalent) (If yes, provide a Copy of the valid Certificate):	
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]

<p>Contact person that PAF: IAST may contact for requests for clarifications during Bid evaluation (Only Lead Bidder)</p>	<p>Name and Title: [Complete] Telephone numbers: [Complete] Email: [Complete]</p>
<p>Please attach the following documents:</p>	<ol style="list-style-type: none"> 1. Company Profile, which should not exceed fifteen (15) pages, including printed brochures and product catalogues relevant to the goods and/ or services being procured. 2. Proposed timetable for delivery, installation and commissioning plan for the required and quoted items to PAF: IAST after the award of Contract. 3. Certificate of Registration of the business. 4. Principal’s Authorization Letter in favor of Bidder to participate in this Tender. 5. A proofing document confirms the offered warranty for at least One (01) year, supported by the manufacturer’s certificates, if applicable. 6. A proofing document confirming supply of same or similar items of this magnitude to various clients/ customers in Pakistan. 7. Proven records of no less than the required Projects of similar nature/ value/ complexity in which delivery and services were extended. 8. Full detailed description of the specifications of the proposed items in addition to catalogues clearly showing the proposed specifications responding to the requirements. 9. Supporting photos of the proposed items, if applicable. 10. Quality certifications: ISO 9001:2015 (if applicable) 11. 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 Bidder:	[Insert Name of Bidder]	Date:	Select date
ITB reference:	PAF: IAST-AIE-ITB-114-21		

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 PAF- IAST.

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

<input type="checkbox"/> Non-performing contracts did not occur during the last 3 years			
<input type="checkbox"/> Contract(s) not performed in the last 3 years			
Year	Non- performed portion of contract	Contract Identification	Total Contract Amount (current value in US\$)
		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
	<i>Information from Balance Sheet</i>		
Total Assets (TA)			
Total Liabilities (TL)			
Current Assets (CA)			
Current Liabilities (CL)			
	<i>Information from Income Statement</i>		
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 public accountant;
- 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 Bidder:	[Insert Name of Bidder]	Date:	Select date
ITB reference:	PAF: IAST-AIE-ITB-114-21		

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

- 1.1 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).
- 1.2 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)
- 1.3 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	<i>[Summarize college/university and other specialized education of personnel member, giving names of schools, dates attended, and degrees/qualifications obtained.]</i> [Insert]
Professional certifications	<i>[Provide details of professional certifications relevant to the scope of goods and/or services]</i> ✦ Name of institution: [Insert] ✦ Date of certification: [Insert]
Employment Record/Experience	<i>[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.]</i> [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.

- 3.1 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.
- 3.2 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.
- 3.3 Implementation plan including a Gantt Chart or Project Schedule indicating the detailed sequence of activities that will be undertaken and their corresponding timing.
- 3.4 Details on post-deployment trainings on-site hands-on training for all LOTS.

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 Pakistan Engineering Council (if applicable).
- 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.
- 4.3 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 Explain whether any services or work would be subcontracted, to whom, how much percentage of the requirements, the rationale for such, and the roles of the proposed subcontractors and how everyone will function as a team.
- 5.3 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 Bidder:	[Insert Name of Bidder]	Date:	Select date
ITB reference:	PAF: IAST-AIE-ITB-114-21		

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 <i>Technical Specifications</i> provided in Section 5a & Section 5b)		Your response Compliance with specifications		Type/ Model no. & Country of Origin
		Comply (Yes/ No)	Quoted Specifications	
Required Items		Offered Items		
Lot #1 Customized Multi-copters Agile Drone				
1.	Custom-Build Agile Multi-copter			
2.	RTK-GNSS Base station (Here+V2 or Equivalent)			
3.	Extra Aerial & Ground Batteries			
Lot #2 Customized Multi-copters Carrier Drone				
1.	Custom-Built Carrier Multi-copter			
2.	RTK-GNSS Base station (Here+V2 or Equivalent)			
3.	Extra Aerial & Ground Batteries			
LOT #3: Drone Swarm and Safety Net				
1.	Flame-Retardant Drone Safety Net (Custom-Made) 30 x 100 Feet			
2.	Flame-Retardant Drone Safety Net (Custom-Made) 25 x 25 Feet			
3.	Loco swarm bundle inclusive additional highlighted accessories			
4.	Drone DJI Mavic 3 Pro or equivalent			

Lot #4: Field Robotics Lab				
1	Unmanned ground vehicle: [Segway RMPLite 220 or equivalent]			
2	Modern Manipulator Arm QArm – Quanser or Equivalent			
Lot #5: IoT, Sensors and IT Equipment				
1	Arduino Edge Control			
2	Arduino Explore IoT Kit			
3	EMoRo 2560 Controller			
4	ARDUINO UNO WiFi REV2			
5	USB 2.0 Cable Type A/B			
6	Soldering Stand : QuadHands Classic Helping Hands Tool			
7	High Precision Barometric Pressure Sensor Grove(DPS310) or equivalent			
8	Gravity: UART Infrared CO2 Sensor (0-50000ppm)			
9	Grove - Gas Sensor (MQ3)			
10	Gravity: Analog CO2 Gas Sensor (MG-811 Sensor)			
11	Gravity: Analog Capacitive Soil Moisture Sensor - Corrosion Resistant			
12	Digital Infrared Temperature Sensor (Grove or equivalent)			
13	Multi-function Environmental Module - CCS811+BME280			
14	Gravity: Non-contact Digital Water / Liquid Level Sensor For Arduino			
15	Air Quality Sensor (CCS811 DFRobot or equivalent)			
16	Water Sensor (Grove or equivalent)			

17	Temperature Sensor (Grove or equivalent)			
18	Temp & Humidity & Barometer Sensor (BME280 Grove or equivalent)			
19	Moisture Sensor (Grove or equivalent)			
20	Hall Sensor (Grove or equivalent)			
21	Analog pH Sensor / Meter Pro Kit For Arduino (Gravity or equivalent)			
22	Ozone Sensor (0-10ppm) (Gravity or equivalent)			
23	SOIL HUMIDITY SENSOR, WATERMARK 2 M / 75 CM (Pack of 6)			
24	Arduino Nano 33 IoT with headers			
25	WiFi Module - ESP8266 (4MB Flash)			
26	ESP-01S Wifi Module with relay or equivalent			
27	Fingerprint Sensor Module (Adafruit or equivalent)			
28	Adafruit DS1307 Real Time Clock Assembled Breakout Board			
29	DS3231 Precision RTC Breakout (Adafruit or equivalent)			
30	MicroSD card breakout board+(Adafruit or equivalent)			
31	HDMI Cables for Raspberry Pi 4 B+ (Micro HDMI to HDMI)			
32	Hot Air Soldering Rework Station w/ Three Nozzles – Quick 957DW+			
33	Engineer Professional Silicone-Tip Solder Sucker			
34	ATTEN 80W 110V Soldering Iron With Station - ST-2090D			

35	128 GB Extreme microSDHC UHS-I Memory Card with Adapter or equivalent			
36	Wire Stripper			
37	Breadboard power supply			
38	Vero Board			
39	Magnifying glass for soldering			
40	Breadboard			
41	RAM - 16GB DDR4 3200MHz SODIMM PC4-25600			
42	SATA 2.5" SSD 512GB for laptops			
43	Keyboards			
Lot #6: Embedded Systems				
1	WiFi LoRa 32 Dev Board (Heltec or equivalent)			
2	LoRa Test Board Kit (LLCC68 based E220-900T30S or equivalent)			
3	LoRa LLCC68 Development Kit 430 MHz 470 MHz			
4	LLCC68 LoRa Module 868MHz 915MHz 30dBm UART			
5	LLCC68 LoRa Module 433MHz 470MHz 30dBm UART			
6	Antenna for LLCC68 LoRa Module 868MHz 915MHz 30dBm UART			
7	DE1-SoC Development Kit including cables and power adapter			
8	DE10 Lite			
9	Super Value Ultimate 37 in 1 Sensor Modules Kit for Arduino & MCU			
10	ZedBoard Zynq-7000 ARM/FPGA SoC Development Board			
11	PYNQ-Z1: Python Productivity for Zynq-			

	7000 ARM/FPGA SoC with Accessory Kit			
12	Eclipse Z7: Zynq-7000 SoC Development Board with SYZYGY-compatible Expansion			
13	ZedBoard Advanced Image Processing Kit (Quad Pcam option)			
14	ZU-5EV (Zynq Ultrascale+ MPSoC Development Board)			
15	Xilinx Virtex-7 FPGA VC707 Evaluation Kit			
16	Universal Programmer (Xeltek Superpro 610p or equivalent)			
17	Zigbee module with antenna (XBee S2C ZigBee (Wire Antenna) or equivalent)			
LOT #7: Furniture for Labs - Chairs				
1.	Chairs			
Lot #8: Intelligent Biomedical Lab				
1	BIOPAC (Data Acquisition System for Biomedical Engineering)			
2	Freestyle Libre 2 Reader with Sensor - Continuous Glucose Monitor (Starter Pack)			
3	Myo gesture control armband			
4	MyoWare 2.0 Muscle Sensor Development Kit			
5	2.2 Inch Flex Sensor			
6	MySignals HW BLE Complete Kit (eHealth Medical Development Platform for Arduino)			
Lot #9: Computer Vision Lab				
1	Jetson Orin Nano Developer Kit			
2	Jetson AGX Orin 64GB Developer Kit			
3	Jetson TX2 NX Module			

Form G: Price Schedule Form

(To be Submitted in a separate and sealed envelope duly marked as Financial Proposal)

Name of Bidder:	[Insert Name of Bidder]	Date:	Select date
ITB reference:	PAF: IAST-AIE-ITB-114-21		

[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 RFP. Our Financial proposal as below is submitted for your kind consideration;

QUOTE PRICE IN PKR

	Quoted Items in compliance to the Technical Specifications as referred in Section – 5a and Section – 5b	Quantity	Unit Price [in Rs. PKR]	GST [in Rs. PKR]	Total Price [in Rs. In Million PKR]
Lot 1 Customized Multi-copters Agile Drone					
1.	Custom-Build Agile Multi-copter	1			
2.	RTK-GNSS Base station (Here+V2 or Equivalent)	1			
3.	Extra Aerial & Ground Batteries	1			
Lot 2 Customized Multi-copters Carrier Drone					
1.	Custom-Built Carrier Multi-copter	1			
2.	RTK-GNSS Base station (Here+V2 or Equivalent)	1			
3.	Extra Aerial & Ground Batteries	1			
LOT #3: Drone Swarm and Safety Net					
1.	Flame-Retardant Drone Safety Net (Custom-Made) 30 x 100 Feet	1			
2.	Flame-Retardant Drone Safety Net (Custom-Made) 25 x 25 Feet	1			
3.	Loco swarm bundle inclusive additional highlighted accessories	2			

4.	Drone DJI Mavic 3 Pro or equivalent	1			
Lot #4: Field Robotics Lab					
1	Unmanned ground vehicle: [Segway RMPLite 220 or equivalent]	1			
2	Modern Manipulator Arm QArm – Quanser or Equivalent	1			
Lot #5: IoT, Sensors and IT Equipment					
1	Arduino Edge Control	10			
2	Arduino Explore IoT Kit	10			
3	EMoRo 2560 Controller	10			
4	ARDUINO UNO WiFi REV2	10			
5	USB 2.0 Cable Type A/B	20			
6	Soldering Stand : QuadHands Classic Helping Hands Tool	2			
7	High Precision Barometric Pressure Sensor Grove(DPS310) or equivalent	10			
8	Gravity: UART Infrared CO2 Sensor (0-50000ppm)	1			
9	Grove - Gas Sensor (MQ3)	10			
10	Gravity: Analog CO2 Gas Sensor (MG-811 Sensor)	10			
11	Gravity: Analog Capacitive Soil Moisture Sensor - Corrosion Resistant	30			
12	Digital Infrared Temperature Sensor (Grove or equivalent)	10			
13	Multi-function Environmental Module - CCS811+BME280	10			
14	Gravity: Non-contact Digital Water / Liquid Level Sensor For Arduino	20			
15	Air Quality Sensor (CCS811 DFRobot or equivalent)	20			
16	Water Sensor (Grove or equivalent)	20			

17	Temperature Sensor (Grove or equivalent)	20			
18	Temp & Humidity & Barometer Sensor (BME280 Grove or equivalent)	10			
19	Moisture Sensor (Grove or equivalent)	20			
20	Hall Sensor (Grove or equivalent)	10			
21	Analog pH Sensor / Meter Pro Kit For Arduino (Gravity or equivalent)	10			
22	Ozone Sensor (0-10ppm) (Gravity or equivalent)	10			
23	SOIL HUMIDITY SENSOR, WATERMARK 2 M / 75 CM (Pack of 6)	10			
24	Arduino Nano 33 IoT with headers	10			
25	WiFi Module - ESP8266 (4MB Flash)	20			
26	ESP-01S Wifi Module with relay or equivalent	20			
27	Fingerprint Sensor Module (Adafruit or equivalent)	10			
28	Adafruit DS1307 Real Time Clock Assembled Breakout Board	10			
29	DS3231 Precision RTC Breakout (Adafruit or equivalent)	5			
30	MicroSD card breakout board+(Adafruit or equivalent)	10			
31	HDMI Cables for Raspberry Pi 4 B+ (Micro HDMI to HDMI)	30			
32	Hot Air Soldering Rework Station w/ Three Nozzles – Quick 957DW+	2			
33	Engineer Professional Silicone-Tip Solder Sucker	2			
34	ATTEN 80W 110V Soldering Iron With Station - ST-2090D	6			
35	128 GB Extreme microSDHC UHS-I	40			

	Memory Card with Adapter or equivalent				
36	Wire Stripper	2			
37	Breadboard power supply	10			
38	Vero Board	20			
39	Magnifying glass for soldering	5			
40	Breadboard	20			
41	RAM - 16GB DDR4 3200MHz SODIMM PC4-25600	12			
42	SATA 2.5" SSD 512GB for laptops	10			
43	Keyboards	30			
Lot #6: Embedded Systems					
1	WiFi LoRa 32 Dev Board (Heltec or equivalent)	10			
2	LoRa Test Board Kit (LLCC68 based E220-900T30S or equivalent)	2			
3	LoRa LLCC68 Development Kit 430 MHz 470 MHz	2			
4	LLCC68 LoRa Module 868MHz 915MHz 30dBm UART	10			
5	LLCC68 LoRa Module 433MHz 470MHz 30dBm UART	10			
6	Antenna for LLCC68 LoRa Module 868MHz 915MHz 30dBm UART	10			
7	DE1-SoC Development Kit including cables and power adapter	2			
8	DE10 Lite	10			
9	Super Value Ultimate 37 in 1 Sensor Modules Kit for Arduino & MCU	8			
10	ZedBoard Zynq-7000 ARM/FPGA SoC Development Board	8			
11	PYNQ-Z1: Python Productivity for Zynq-7000 ARM/FPGA SoC with Accessory Kit	8			
12	Eclipse Z7: Zynq-7000 SoC Development Board with SYZGY-compatible Expansion	1			

13	ZedBoard Advanced Image Processing Kit (Quad Pcam option)	5			
14	ZU-5EV (Zynq Ultrascale+ MPSoC Development Board)	1			
15	Xilinx Virtex-7 FPGA VC707 Evaluation Kit	1			
16	Universal Programmer (Xeltek Superpro 610p or equivalent)	5			
17	Zigbee module with antenna (XBee S2C ZigBee (Wire Antenna) or equivalent)	10			
LOT #7: Furniture for Labs - Chairs					
1.	Chairs	40			
Lot #8: Intelligent Biomedical Lab					
1	BIOPAC (Data Acquisition System for Biomedical Engineering)	1			
2	Freestyle Libre 2 Reader with Sensor - Continuous Glucose Monitor (Starter Pack)	2			
3	Myo gesture control armband	2			
4	MyoWare 2.0 Muscle Sensor Development Kit	2			
5	2.2 Inch Flex Sensor	20			
6	MySignals HW BLE Complete Kit (eHealth Medical Development Platform for Arduino)	1			
Lot #9: Computer Vision Lab					
1	Jetson Orin Nano Developer Kit	4			
2	Jetson AGX Orin 64GB Developer Kit	4			
3	Jetson TX2 NX Module	4			

Extended Warranty Price (at discretion of PAF-IAST)

QUOTE PRICE IN PKR

	Quoted Items in compliance to the Technical Specifications as referred in Section – 5a and Section – 5b	2 nd Year (PKR)	3 rd Year (PKR)	4 th Year (PKR)
Lot 1 Customized Multi-copters Agile Drone				
1.	Custom-Build Agile Multi-copter			
3.	RTK-GNSS Base station (Here+V2 or Equivalent)			
4.	Extra Aerial & Ground Batteries			
Lot 2 Customized Multi-copters Carrier Drone				
2.	Custom-Built Carrier Multi-copter			
3.	RTK-GNSS Base station (Here+V2 or Equivalent)			
4.	Extra Aerial & Ground Batteries			
LOT #3: Drone Swarm and Safety Net				
1.	Flame-Retardant Drone Safety Net (Custom-Made) 30 x 100 Feet			
2.	Flame-Retardant Drone Safety Net (Custom-Made) 25 x 25 Feet			
3.	Loco swarm bundle inclusive additional highlighted accessories			
4.	Drone DJI Mavic 3 Pro or equivalent			
Lot #4: Field Robotics Lab				
1	Unmanned ground vehicle: [Segway RMPLite 220 or equivalent]			
2	Modern Manipulator Arm QArm – Quanser or Equivalent			
Lot #5: IoT, Sensors and IT Equipment				
1	Arduino Edge Control			
2	Arduino Explore IoT Kit			
3	EMoRo 2560 Controller			
4	ARDUINO UNO WiFi REV2			
5	USB 2.0 Cable Type A/B			

6	Soldering Stand : QuadHands Classic Helping Hands Tool			
7	High Precision Barometric Pressure Sensor Grove(DPS310) or equivalent			
8	Gravity: UART Infrared CO2 Sensor (0-50000ppm)			
9	Grove - Gas Sensor (MQ3)			
10	Gravity: Analog CO2 Gas Sensor (MG-811 Sensor)			
11	Gravity: Analog Capacitive Soil Moisture Sensor - Corrosion Resistant			
12	Digital Infrared Temperature Sensor (Grove or equivalent)			
13	Multi-function Environmental Module - CCS811+BME280			
14	Gravity: Non-contact Digital Water / Liquid Level Sensor For Arduino			
15	Air Quality Sensor (CCS811 DFRobot or equivalent)			
16	Water Sensor (Grove or equivalent)			
17	Temperature Sensor (Grove or equivalent)			
18	Temp & Humidity & Barometer Sensor (BME280 Grove or equivalent)			
19	Moisture Sensor (Grove or equivalent)			
20	Hall Sensor (Grove or equivalent)			
21	Analog pH Sensor / Meter Pro Kit For Arduino (Gravity or equivalent)			
22	Ozone Sensor (0-10ppm) (Gravity or equivalent)			
23	SOIL HUMIDITY SENSOR, WATERMARK 2 M / 75 CM (Pack of 6)			
24	Arduino Nano 33 IoT with headers			
25	WiFi Module - ESP8266 (4MB Flash)			
26	ESP-01S Wifi Module with relay or equivalent			
27	Fingerprint Sensor Module (Adafruit or equivalent)			
28	Adafruit DS1307 Real Time Clock Assembled Breakout Board			
29	DS3231 Precision RTC Breakout (Adafruit or equivalent)			
30	MicroSD card breakout board+(Adafruit or equivalent)			

31	HDMI Cables for Raspberry Pi 4 B+ (Micro HDMI to HDMI)			
32	Hot Air Soldering Rework Station w/ Three Nozzles – Quick 957DW+			
33	Engineer Professional Silicone-Tip Solder Sucker			
34	ATTEN 80W 110V Soldering Iron With Station - ST-2090D			
35	128 GB Extreme microSDHC UHS-I Memory Card with Adapter or equivalent			
36	Wire Stripper			
37	Breadboard power supply			
38	Vero Board			
39	Magnifying glass for soldering			
40	Breadboard			
41	RAM - 16GB DDR4 3200MHz SODIMM PC4-25600			
42	SATA 2.5" SSD 512GB for laptops			
43	Keyboards			
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1	WiFi LoRa 32 Dev Board (Heltec or equivalent)			
2	LoRa Test Board Kit (LLCC68 based E220-900T30S or equivalent)			
3	LoRa LLCC68 Development Kit 430 MHz 470 MHz			
4	LLCC68 LoRa Module 868MHz 915MHz 30dBm UART			
5	LLCC68 LoRa Module 433MHz 470MHz 30dBm UART			
6	Antenna for LLCC68 LoRa Module 868MHz 915MHz 30dBm UART			
7	DE1-SoC Development Kit including cables and power adapter			
8	DE10 Lite			
9	Super Value Ultimate 37 in 1 Sensor Modules Kit for Arduino & MCU			
10	ZedBoard Zynq-7000 ARM/FPGA SoC Development Board			
11	PYNQ-Z1: Python Productivity for Zynq-7000 ARM/FPGA SoC with Accessory Kit			
12	Eclipse Z7: Zynq-7000 SoC Development Board with SYZYGY-compatible Expansion			

13	ZedBoard Advanced Image Processing Kit (Quad Pcam option)			
14	ZU-5EV (Zynq Ultrascale+ MPSoC Development Board)			
15	Xilinx Virtex-7 FPGA VC707 Evaluation Kit			
16	Universal Programmer (Xeltek Superpro 610p or equivalent)			
17	Zigbee module with antenna (XBee S2C ZigBee (Wire Antenna) or equivalent)			
LOT #7: Furniture for Labs - Chairs				
1.	Chairs			
Lot #8: Intelligent Biomedical Lab				
1	BIOPAC (Data Acquisition System for Biomedical Engineering)			
2	Freestyle Libre 2 Reader with Sensor - Continuous Glucose Monitor (Starter Pack)			
3	Myo gesture control armband			
4	MyoWare 2.0 Muscle Sensor Development Kit			
5	2.2 Inch Flex Sensor			
6	MySignals HW BLE Complete Kit (eHealth Medical Development Platform for Arduino)			
Lot #9: Computer Vision Lab				
1	Jetson Orin Nano Developer Kit			
2	Jetson AGX Orin 64GB Developer Kit			
3	Jetson TX2 NX Module			

QUOTE PRICE IN PKR

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

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

Offered Percentage Discount in case LC (Letter of Credit) is opted as Mode of Payment:

Final Bid Value in Figures (including Extended Warranty & Discount):_____

Final Bid Value in words (including Extended Warranty & Discount):_____

Name & Designation of Authorized Person:_____

Signature: _____ (Please affix company stamp here)

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

Annex – 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 disclosure, 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 times 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]

Annex – II: Draft Contract Sample

Available at PAF: IAST website at <http://www.paf-iastr.edu.pk/downloads>