

Request for Proposal (RFP)

for

**Supply and Installation of Scientific Equipment for
Central High-Tech. Laboratory and Eight Departmental
Laboratories of the Government College University
Faisalabad (GCUF)**

Last Date for Submission:

11-06-2014 at 12:00 Noon

Bid Opening Date:

11-06-2014 at 12:30 Noon



GC UNIVERSITY FAISALABAD

Postal Address:

**GC University, Allama Iqbal Road, Faisalabad
(Phone: 041 9201566)**

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1. KEY DEFINITIONS

- 1.1 GC University, Faisalabad. Government College University, Faisalabad
- 1.2 SLA: Service Level Agreement: The level of service which GCU, Faisalabad purchases from vendor in respect of the service.
- 1.3 RFP: Request for Proposals.
- 1.4 BOQ: Bill of Quantities.
- 1.5 JV Firms: Joint Ventured Firms having Lead Firm responsible for overall coordination and execution of contractual obligations as per signed agreement.
- 1.6 Lead Firm: One of the joint ventured firms responsible for overall coordination and execution of the signed contract.
- 1.7 Total Bid Value: Cost of equipment/hardware/services as per BOC including Cost of initial Two (2) years of O&M Warranty and maintenance support services and Any other additional prescribed cost.
- 1.8 Bidder: Bidder(s) who has submitted the proposals.
- 1.9 Selected Bidder: Bidder(s) selected for the award of tender.
- 1.10 First Party : GC University, Faisalabad
- 1.11 Second Party: Selected Bidder/Bidders.
- 1.12 Trouble Ticket: A File that identified the fault, the technical detail.
- 1.13 Call-out Interval: The time between Network Operation Centre issuing a trouble ticket to the concerned vendor engineer and confirming that the trouble ticket is received and accepted by the vendor.
- 1.14 Restoration Time: time measured between a trouble ticket being received and accepted by the vendor and restoration of the system(s)/service(s)/functionality (ies) in subject to operation condition.
- 1.15 Resolve: To restore the system(s)/services(s)/functionality (ies) on which a trouble ticket is issued and complete all further activities necessary to close the trouble ticket.
- 1.16 Resolution Time: The time measured between a Trouble ticket being received and accepted by the vendor and the answer to / completion of the trouble ticket.



2. INTRODUCTION

GC University, Faisalabad has emerged as a leading center of learning and research in a short span of time. The University with its dynamic faculty and innovative syllabi has become a catalyst of intellectual, social and industrial change. It caters to the diverse needs of society by imparting education in almost all the major fields of learning.

The GC University's journey started as a primary school in 1897 in the present building of Govt. College for Women, Karkhana Bazar, Faisalabad. It was promoted to High School and Intermediate College in 1905 and 1924 respectively. It was elevated to the degree level in 1933 and postgraduate disciplines were introduced in 1963. The long journey that started with the humble beginning reached its climax when it was granted the status of University in October 2002.

The university is situated at the Jhang Road not far from the historical Clock Tower. The main campus is spread on 37 acres and the construction of new campus has been started on an area of 200 acres some 3-4 kilometers away from the main campus at Jhang Road.

The University is offering educational degrees in different disciplines. The University is a hub of educational, social and cultural activities with a close liaison with industry.



3. SCOPE OF WORK

Following requirements define the scope of work of this Tender:

- 3.1 Bidders are required to conduct survey of the site prior to submission of the bids.
- 3.2 The Selected Bidder(s) will be responsible for the supply, installation and commissioning of scientific equipment for the offered laboratories.
- 3.3 Vendors will also be responsible for maintenance of scientific equipments supplied at GC University, Faisalabad as per contract agreement.
- 3.4 Vendors must ensure that the supplied equipment is fully operational, new, perform properly and meet RFP's Technical Specification.
- 3.5 At the time of installation and commissioning, the vendors must provide comprehensive documentation of system deployed including diagrams, configuration and manuals etc.
- 3.6 The Vendors shall be responsible for minimum 2 years of services for operation and maintenance as per SLA clauses for the equipment provided, without any extra cost or hidden charges.

4. BIDS SUBMISSION REQUIREMENTS

The objective of bid submission requirement is to provide bidders the information to submit their bid(s) in response of this RFP according to the specifications defined in this RFP and in order/sequence as set forth in this document. Bidders must pursue following requirements for their proposals/bids.

- 4.1 For this tender PPRA's Rule number 36(b) 'Single stage - Two Envelope' procedure of open competitive bidding shall be adopted.
- 4.2 The Bids shall comprise of single envelope containing two separate envelopes, i.e. Technical and Financial Proposals, and clearly marked Technical and Financial proposals on the respective envelopes. Envelopes must also be labeled with the name, address and contact number of the bidding company, and also the title of the Tender for which the bid is being submitted.
- 4.3 This Tender is floated on Turnkey Basis for the Lab(s) defined in Form-I of this Tender Document. Minimum one lab module should be offered for consideration of bid.
- 4.4 The bidder can submit bid as Joint Venture Firm. In this case name of the Leading Firm should be clearly defined for overall coordination and execution of the contractual obligations as per signed agreement.
- 4.5 The Bidders shall submit Technical Proposals along with brochures/data sheets explaining of the items quoted.



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- 4.6 The bid should be submitted using **Annex-I "Proposal Submission Form"** as covering letter by the authorized representative of the bidding firm.
- 4.7 The integrity pact need to be furnished on legal stamp paper along with bid. Sample is given at **Annex- II "Integrity Pack Format"**.
- 4.8 The Bidders shall provide Company profile, Authorization & relationship with principal firm(s), location of branch offices, company experience in related field, technical staff details (branch-wise), project completed, major clients' list as per the format given in **Annex-III "Firm's References"**, equipment's technical details (brochures, etc.) mentioning compliance and properly highlighting all the compliance specification as requested in Form-I "Technical Requirements" by clearly mentioning make, model, origin, part number, etc.
- 4.9 For qualifying in Technical responsiveness, bidders shall comply attributes/ requirement mentioned in **Annex-IV "Mandatory Requirements"**.
- 4.10 For scoring of the Technical Bids an Evaluation Criteria referred at **Annex-V " Technical Evaluation Scoring Criteria"** will be used.
- 4.11 The Bidders are required to fill and sign all pages of **Annex-VI "Bill of Quantity(ies)"** while following the format given, and submit it as Financial Proposal. Financial Proposals not following the given format may lead to the rejection of bid.
- 4.12 The Bidders must include Warranty/Services as per SLA requirement defined in **Annex-VII " Minimum Requirement for Service Level Agreement For Equipment and Services "** for equipment cost of Two year within the cost of equipment.
- 4.13 The Bidders shall submit a signed letter with Official stamp affixed on it as per the format given in **Annex-VIII "Technical Compliance Certificates/Compliance Undertaking"** as a cover letter for the Bid/Proposal. Bids/Proposals submitted without this cover letter will not be accepted and bids will be rejected straightaway.
- 4.14 To understand this RFP's requirement the bidders should read carefully **Annex- IX "Lab Equipment Description and Specification"** before preparing Technical and Financial Proposals
- 4.15 The Bidders must quote for complete solution given in the **Form-I entitled "Technical Requirements"**. Otherwise it may lead to rejection of whole bid.
- 4.16 The Bidders are required to fill and sign the **"Technical Reuirements" Form-I** as provided in this RFP and must submit it along with Proposal.
- 4.17 If a bidder has quoted multiple options, in this case bidder should submit the earnest money equal to 2% of highest quoted option.
- 4.18 The Bidders are required to submit their proposals in foreign currency on the basis of Cost, Insurance & Freight value. Bank draft/ Payorder equal to 2% of the Total Bid Value should accompany the bid as part of financial proposal as earnest money drawn in favor of Treasurer GC University, Faisalabad. The bid shall not be considered without earnest money.



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5. SELECTION PROCEDURE

- 5.1 Evaluation of the firms shall be based on information provided in Proposals.
- 5.2 As a part of evaluation, bidders may be asked to conduct presentation/demonstration (if required).
- 5.3 The Technical Evaluation of Bids will be done as per Technical Evaluation Scoring Criteria mentioned at Annex-V of this RFP. The bid scoring at least 65% of total technical score will be included in list of responsive bids.
- 5.4 On the basis of technical evaluation, the financial proposal of only technically responsive bidders (qualified bidders) will be opened in the presence of their representatives who choose to attend.
- 5.5 For this tender weightage of Technical and Financial proposals shall be 70% and 30% respectively.
- 5.6 The profiles of the JV firms will be combined for composit scoring for Technical Evaluation of the bid whereas Financial Evaluation will be done on the basis of Bid Value submitted by the Bidder.
- 5.7 For qualifying in Technical responsiveness, bidders shall fulfill all the requirements as laid out in Annex-IV "Mandatory Requirements". If any of the mandatory requirements is not met by the bidder, the bid will be cancelled straightaway and no further consideration will be given. Financial proposals of bids found technically non-responsive will be returned unopened.
- 5.8 The composit score of Technical and Financial bids will be used for award of contract having highest score out of 100 (Technical 70+Financial 30).
- 5.9 As a part of evaluation, Technical Evaluation committee may visit bidder's reference sites or inquire the further clarification / information to validate the Bidders information (if required).
- 5.10 After the approval of contract award, a contract agreement on the stamp paper worth Rs. 100/- shall be executed by the firm with selected bidder within 15 days from the date of issuance of Letter of Intent on standard terms and conditions.

6. TERMS OF PAYMENT

- 6.1 100% payment through Letter of Credit.
- 6.2 No payment shall be made in advance to the selected bidder.
- 6.3 The successful bidder must provide O & M and comprehensive part warranty services for Two (02) Years.
- 6.4 The successful bidder also has to furnish the Performance Bank Guarantee/ Pay order equivalent to 5 % of the 2 years cost of warranty and services under SLA (if quoted separately). The said Bank Guarantee will be released after contractual service tenure.





GOVT COLLEGE UNIVERSITY FAISALABAD

TENDER NOTICE NO. 214/2014

Government College University, Faisalabad (GCUF) invites sealed tenders / bids from the well reputed firms / importers / suppliers duly registered with Sales Tax and Income Tax Departments, for the procurement of **Scientific Equipment for Central High Tech Laboratory and Eight Departmental Laboratories** under the project "Provision of Academic and Research Facilities of Government College University Faisalabad". The rates must be quoted on the basis of "Cost, Insurance and Freight" for the equipment to be imported from European Economic Countries, North America, Australia and Japan origin or the products equivalent in quality with aforementioned countries. The procurement shall be completed in accordance with Punjab Procurement Rules 2014, on Single Stage - Two Envelope Bidding Procedure.

2. Tender documents along with specifications of the equipment can be obtained from the office of the treasury on cash payment of Rs. 2000/- as tender processing fee (non-refundable). However, on-line payment under account no. 03080010012970004 Bank of Punjab, GC University Branch will also be acceptable. Moreover, Tender Documents can be downloaded from university website www.gcuf.edu.pk and PPRA's website www.ppra.org.pk, www.ppra.punjab.gov.pk. However, firms will be required to attach the pay order of Rs. 2000/- as tender processing fee (non-refundable) along with the bid.
3. A single package containing two envelopes, Technical and Financial separate Bids, duly completed, signed, stamped, sealed duly conformity with Tender Documents should be dropped in Tender Box placed at Treasurer's office, of the GCUF, not later than **1200 Hrs on 11.06.2014**. Technical Bids will be opened first on **11.06.2014 at 1230 Hrs**, and Financial Bids will be opened (as per schedule issued later on) for only those Successful Technical Bids which are acceptable to the "Technical Committee". Whereas, Financial Bids of unsuccessful Bidders will be returned un-opened.
4. All bidders are required to attach Bid Security (Refundable) at the rate of 2% of Bid value in shape of CDR in favor of "Treasurer GCUF". Bid Security (in original) must be attached with the Financial Bid. Bids which are incomplete (unsigned, unstamped, unsealed, without tender fee & bid security will not be considered.
5. Income/Sales Tax Registration Certificate, CNIC and other documents as mentioned in the Tender Documents must accompany the bids. Taxes will be deducted as per GOP rules.
6. GCUF Administration may reject all bids at any time prior to the acceptance of a bid, as provided under Rule-35 of Punjab Procurement Rules, 2014.

NOTE: The earlier advertisement published in daily newspapers and PPRA Federal vide IPL No. 5357 & TS210477E respectively shall stands cancelled hence this advertisement.

(Prof. Dr. Farhat Abbas)
Project Director

GC University, Allama Iqbal Road, Faisalabad

8 GENERAL TERMS AND CONDITIONS

The following general terms & conditions apply to this RFP.

- 8.1 The bidder must be registered with Sales Tax and Income Tax Department.
- 8.2 An affidavit to the effect that the firm has not been blacklisted by any Government/Semi Government organization.
- 8.3 The University reserves the right to accept/reject wholly or partially any tender at any stage of the tender process.
- 8.4 The university reserves the right to award contract to successful bidder(s) on lab-wise as per financial availability.
- 8.5 Validity period of the bids regarding the award of contract shall be 90 days (extenable) with the consent of both parties.
- 8.6 The decisions of University will be binding on all concerned and will in no case be challengeable at any forum or any court of law.
- 8.7 Bids are liable to be rejected if; they are not conforming the terms, conditions and specifications stipulated in this RFP.
- 8.8 During the examination, evaluation and comparison of the bids, the University at its sole discretion may ask the bidder for clarifications of its bid.
- 8.9 The request for clarification and the response shall be in writing/email. However, no change in the price or substance of the bid shall be sought, offered or permitted after bid submission.
- 8.10 Total Bid Value (Cost of equipment, Cost of Installation & Commissioning and Cost of Service Level Agreement (SLA) as per BOQ shall account for financial evaluation and so shall be included in Total Bid Value. The Bidder can submit built-in SLA cost as part of Lab equipment cost or show separately as per lab module.
- 8.11 The amount submitted as Earnest Money shall be refunded to the unsuccessful bidders after the decision of "Tender Committee" for the award of said tender.
- 8.12 If there is a discrepancy between unit price and total price in the submitted bid which is obtained by multiplying the unit price and quantity, the unit price shall prevail and total price shall be corrected. If there is a discrepancy between the words and figures, the



amount in words shall prevail. If there is a mistake in addition/ totaling, that shall be corrected. If the bidder does not accept the corrected amount of bid, his bid shall be rejected and his bid security forfeited.

- 8.13 Incomplete and conditional BIDs will not be entertained.
- 8.14 For this tender, all updates/changes shall be communicated through email.
- 8.15 In case of any dispute between the two parties of any matter arising out of after signing the contract agreement, the case shall be referred to the Vice Chancellor, GC University whose decision shall be final and binding on both parties.
- 8.16 Bids submitted via email or fax will not be entertained.
- 8.17 Any query regarding this RFP can be addressed to the Project Director for through email mentioned in the Tender Notice.

9 MEET OR EXCEED SPECIFICATIONS

The specifications provided in this RFP are the minimum requirements of specific laboratories of GC University . The vendors must meet or may exceed these specifications to meet the actual requirements of this Project and its successful practical implementation. But in such a case additionally proposed or altered specifications should clearly be highlighted to enable the University to clearly identify modified specifications.

10 CLARIFICATIONS

Queries regarding this RFP shall be submitted in writing to:

Prof. Dr. Farhat Abbas
Project Director,
GC University Faislabad.

Phone: +92 41 920 1566
Email: farhat@gcuf.edu.pk



Annex I

Proposal Submission Form.

The Project Director
GC University,
Faislabad

Sir

We, the undersigned, offer to provide the offer for "Supply/Installation of scientific equipments for _____ for Proposal dated _____, and our Proposal. We are hereby submitting our Financial Proposal along with Technical compliance, sealed in envelope.

We understand you are not bound to accept any Proposal you receive and reserves the right to accept or reject any offer and to annul the bidding process and reject all proposals without assigning any reason or having to owe any explanation whatsoever.

The decision of evaluating committee shall be final and cannot be challenged on any ground at any forum and the evaluating committee will not be liable for any loss or damage to any party acting in reliance thereon.

We remain,

Yours' sincerely

Authorized Signature:
Name and Title of Signatory:
Name of Firm:
Address:



Annex-II

Integrity Pack Format

**DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC.
PAYABLE BY THE SUPPLIERS OF GOODS, SERVICES & WORKS IN
CONTRACTS WORTH RS.10.00 MILLION OR MORE**

Contract Number: _____ Dated: _____

Contract Value: _____

Contract Title: _____

_____ hereby declares 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 practice.

Without limiting the generality of the foregoing, _____ represents and warrants that it has fully declared the brokerage, commission, fees etc. paid or payable to anyone and 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 natural 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 consultation fee or otherwise, with the object of obtaining or inducing the procurement of a contract, right, interest, privilege or other obligation or benefit in whatsoever form 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.

_____ accepts 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 indemnify 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 form from GoP. [Company Name]



Annex III

Firm's References

Using the format below, pl provide information on each reference assignment for which your firm/JV, either individually as a corporate entity or as one of the major companies within an association, was legally contracted.

Relevant Supply carried out in the Last three Years

List of items			University/ Institute	
City			Key Professional Staff Provided by Your Firm/ entity(profiles):	
Laboratory			NO. of Staff:	
Address:			NO. of Staff-Months; duration of assignment:	
Start (Month/Year):	Date	Completion (Month/Year):	Date	Approx. Value of tender (in Current):
Name and contact details of concerned project director				Total Duration
Narrative Description of Project:				
Description of Actual Services Provided by Your Staff:				

Firm's Name: _____

Stamp: _____



Annex-IV

Mandatory Requirement for Participating Bidders

S. No.	Attributes	Reference Page#
1.	Firms with Income Tax Certificate / GST Certificate, SECP and PEC registered.	
2.	Affidavit (that the firm has not been blacklisted by private, Govt., Semi Govt. and Autonomous Body)	
3.	The bidder should have at least 5 years of relevant experience in supplying, installation, commissioning and technical support of scientific equipments HEIs and R&D organizations.	
4.	The Bidder should quote the bid for the Lab-Module(s) on turn key basis.	
5.	The SLA proposal (initially for two years) for the selected Lab-module(s) should be submitted by the Bidding company alongwith rates for performance based perpetual extensions for multiple years.	
6.	Quoted product must be European Economic Countries /USA/Canada/Japan origin or the products equivalent in quality with aforementioned countries.	
7.	Completely filled BOC (as part of Financial Bid) needs to be submitted.	
8.	Filled Technical Compliance Sheet (clause by clause compliance of RFP with Component Level part numbers and reference brochures)	
9.	Project Execution Plan (Time Lines, Resources, dedicated Staff, etc.)	
10.	Minimum 100 million Financial Turnover for the last three year in similar nature Projects.	



Annex-V

Technical Evaluation Scoring Criteria

S. No.	Attributes	Max. Score	Weightage done by GCUF	Criteria	Reference Page# Documentary Proof
1.	Company in Operations (Number of years) Documentary proof and references required	5		Number of years of Bid in consideration/ Maximum Year amongst all of the Bids* 10	
2.	Technology Certified Engineers and Technical support persons	10		Number of Certified Human Resources mentioned in the Bid in consideration/ Highest Number of Certified Resources amongst all bids * 10.	
3.	User Certification for the demonstrated Technical/ Service support against completed projects	5		Supporting documents will be used for scoring considering number of clients, complexity of service and value of installed facility under referred projects.	
4.	Number and value of similar nature Projects completed in different HEIs/ R&D organizations	10		Number of Projects of Bid in consideration/ Highest No. Projects amongst all bids * 10	
5.	Traning Plan for operations and utilization	10		Training Modules(2), Trainer Profile(2), Level of Training(2), schedule (2) and certification offered (2) will be used for scoring.	
6.	SLA Proposal Features and options offered	10		Key Item coverage (2), level of support (2), maintenance schedule (2). Response Time (2) and Technical support profile staff profile(2) will be used for scoring.	
7.	Installation and Commissioning period of offered lab-modules after delivery	5		The minimum period among responsive bids will carry maximum scoring	
8.	Number of Labs-Modules quoted by the bidders.	5		The weightage of maximum number of labs offered on turn key basis will be used for scoring.	
9.	Project Execution Plan for timely and efficient	10		(a) Activity schedules, site inspection, delivery & commissioning Plans (3),	

	execution of the proposed Bids.		Training sessions (2), Project related Dedicated Management, Technical & Support HR (3) and Completeness of bidding documentation, references and presentation (2) will usedfor scoring.	
SubTotal		70		



Annex VI: Bill of Quantity(ies):

Annex VI-A: Bill of Cost-Equipment for Chemistry Lab

Sr. #	Description	Unit	Qty	Unit Price	Total Price
1	pH, Conductivity TDS Meter:	No.	05		
2	Hotplate with Stirrer:	No.	10		
3	Water Still Merit:	No.	5		
4	Conductometer:	No.	3		
5	UV Lamp:	No.	5		
6	Analytical Balance:	No.	4		
7	Digital Oven: Int.	No.	3		
8	Electrically Heated Muffle Furnace:	No.	3		
9	Water Bath: Bath:	No.	2		
10	Rotatory Evaporator System:	No.	2		
11	Spectro UV-VIS Dual Beam & Auto Cell Scanning Spectrophotometer:	No.	2		
12	UV Single Beam Spectrophotometer:	No.	2		
13	FTIR spectrometer (bench-top):	No.	1		
	Total				



Annex VI: Bill of Quantity(ies):

Annex VI-B: Bill of Cost- Equipment for Department of Wildlife & Fisheries Lab

Sr. #	Description	Unit	Qty	Unit Price	Total Price
1	Walk-in Cold Room 10'x10'x10' WALK-IN COLD ROOMS. Matrix.	No.	1		
2	Camera fitted Light microscope with monitors and accessories.	No.	1		
3	Inverted Microscope with monitors and accessories	No.	2		
4	Autoclave Horizontal (large size)	No.	1		
5	Telescope Saxon90 mm, Terrestrial Refractor Telescope	No.	5		
6	Night Vision Equipment	No.	2		
7	Shaker incubator	No.	2		
8	Radio Telemetry Complete Apparatus	No.	2		
9	Glass distillation plant complete with accessories.	No.	5		
10	Electronic balance (Four Digit)	No.	3		
11	Water bath (Temperature controlled)	No.	1		
12	Refrigerators (12 cubic feet with stabilizer)	No.	3		
13	Homogeniser	No.	1		
14	Vortex	No.	4		
15	Ice Flake Maker	No.	1		
16	DO Meter	No.	4		
17	pH Meter (digital bench model)	No.	4		
18	EC Meter (digital bench model)	No.	4		
19	Vacuum Oven	No.	1		
20	Vacuum Pumps	No.	2		
21	Light meter	No.	2		
22	Turbidity Meter	No.	2		
23	UV lamps	No.	2		
24	Drying Cabinet	No.	1		
25	Precision pipettes	No.	5		
26	Freezer (-20 C)	No.	2		
27	Blenders (various processing capacities)	No.	3		
28	Liquid nitrogen flasks (Dewar)	No.	3		
29	Microwave oven	No.	3		
30	Automatic air compressor	No.	4		
31	Oxygen Cylinder 48 CFT with trolley	No.	5		
32	Microtome with accessories	No.	1		
33	Chlorophyll extraction with filtration assemblyvacuum pump,	No.	1		
34	Automatic tissue processor	No.	1		
35	Biohazard safety cabinets (Class II)	No.	1		
36	Embedding center	No.	1		
37	Incubator	No.	1		
38	Laminar flow	No.	1		
39	4 Ft Laboratory Fume Hood Bench Top Model	No.	1		
40	Hot plate /stirrer	No.	2		
41	Pipette Aid Automatic	No.	2		
42	High speed re refrigerated centrifuge with accessories	No.	1		
43	Protein Electrophoresis apparatus with all accessories	No.	1		
44	Microplate reader with accessories	No.	1		
45	Spectrophotometer with all accessories	No.	1		
46	Cryotome with all accessories	No.	1		
47	Bench top orbital shaker	No.	1		
48	DNA concentration System with accessories	No.	1		



Annex VI: Bill of Quantity(ies):

Annex VI-B: Bill of Cost- Equipment for Department of Wildlife & Fisheries Lab

Sr. #	Description	Unit	Qty	Unit Price	Total Price
49	Hybridization oven	No.	1		
50	Microfuge high speed centrifuge machine	No.	1		
51	Hydro Tech Gel Drying System	No.	1		
52	Sonicator	No.	1		
53	Vacuum Pump	No.	1		
54	Vacuum Blotting system	No.	1		
55	Eye wash station	No.	2		
56	Polaroid gel documentation system	No.	2		
57	96-Well PCR Thermal Cyclers (Thermocyclers)	No.	1		
58	Trays for gels	No.	3		
59	Lab Twin Screw Extruder	No.	1		
60	Soxtec 1043 mit Service Unit 1046	No.	1		
61	Flame spectrophotometer	No.	1		
62	Micro Kjeldhal Apparatus	No.	1		
63	Electrically Heated Muffle Furnace	No.	1		
64	Feed mixture one ton capacity semi automatic	No.	1		
65	Liquid Nitrogen cylinder	No.	2		
66	Sieve shaker Mechanical with sieves set ASTM	No.	1		
67	Magnetic Stirrer	No.	1		
68	Incubator for BOD	No.	10		
69	Biofilter	No.	1		
70	Fiber glass tanks	No.	1		
71	Pressure Chamber & Osmometer	No.	1		
72	Chlorophyll Content Meter	No.	3		
73	Electric - Electric/Wood/Coal Furnace	No.	1		

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Abbas

Annex VI: Bill of Quantity(ies)

Annex VI-C: Bill of Cost- Equipment for Department of Physics Lab

Sr. #	Description	Unit	Qty.	Unit Price	Total Price
1	Oscilloscopes 20MHz 220 V AC 50-60 Hz	No.	15		
2	Audio Generator 10 Hz to 1 MHz	No.	15		
3	Analog Digital Trainer	No.	15		
4	Digital Multimeter 200 m V – 1000 V 10A	No.	15		
5	Bench-type Top LCD Digital Multimeter	No.	10		
6	Fluke 8846A Digital Benchtop Multimeter	No.	5		
7	Datalogging Heavy Duty Light Detector	No.	5		
8	Analytical Balance Micro rays (0.1 mg)	No.	3		
9	Gas Flow Meter	No.	3		
10	Mortar Pestle (3set)	No.	3		
11	Laser Power Meter	No.	2		
12	Adventurer Electronic Balance	No.	2		
13	LCR Meter frequency from KHz –MHz	No.	2		
14	Constant current and voltage power supply	No.	2		
15	Cryostat for Liquid Nitrogen of capacity(35 ltr)	No.	2		
16	Temperature Controller	No.	2		
17	Oscilloscope (dual trace 4 channel)	No.	2		
18	Magnetic Stirrer	No.	2		
19	Water Bath Capacity 15 liter	No.	2		
20	Thermal cycling oven	No.	2		
21	Nd YAG laser (solid state laser with first second and third harmonic generations) YAG Laser with Amplifier	No.	1		
22	Spectrometer (LIBS 2500 Plus with 7 Channels)	No.	1		
23	Turbo molecular pump, rotary pump,	No.	1		
24	FC-3000 Flip Chip Bonder	No.	1		
25	Delay Generator	No.	1		
26	Vacuum Chamber with 7 ports, Chamber stand and other Accessories for vacuum Chamber	No.	1		
27	Optics for laser, Optics table, magnetic mounts etc.	No.	1		
28	Vacuum chamber	No.	1		
29	High temperature furnace	No.	1		
30	Ball Mill	No.	1		
31	Air Sampler	No.	1		
32	Hydraulic press (20 ton)	No.	1		
33	Oven (200 °C)	No.	1		
34	Centrifuge Machine Ultra – 50000 RPM	No.	1		
35	Portable Metal Hardness Tester,	No.	1		
36	Microcontroller Burner And Programmer	No.	1		
37	Solar Power System	No.	1		
38	WIEN2k Software	No.	1		
39	Humidity chamber up 90% RH.	No.	1		
Total					



Annex VI: Bill of Quantity(ies)

Annex VI-D: Bill of Cost- Equipment for Applied Chemistry Lab

Sr. #	Description	Unit	Qty	Unit Price	Total Price
1	Differential scanning calorimeter (DSC),	No.	1		
2	Thermo-mechanical Analyzer	No.	1		
3	Oven (Digital)	No.	2		
4	Analytical balance	No.	3		
5	GC-MS,	No.	1		
6	Air Conditioner	No.	3		
7	Optical microscope	No.	1		
8	Rotatory evaporator	No.	2		
9	Water deionizer,	No.	1		
	Total				



Annex VI: Bill of Quantity(ies)

Annex VI-E: Bill of Cost- Equipment for Department of Microbiology & Physiology Lab

Sr. #	Description	Unit	Qty	Unit Price	Total Price
1	Micro Dispenser	No.	6		
2	Portable Balance	No.	5		
3	Egg Candler Local Made	No.	5		
4	Colony Counter,	No.	4		
5	Staining Rack	No.	4		
6	Water Bath	No.	4		
7	Phase Contrast Microscope	No.	3		
8	Refrigerator 586 Lit, HRB 701-F	No.	3		
9	AUTOCLAVE	No.	2		
10	Centrifuge	No.	2		
11	Micro Filtration Apparatus	No.	2		
12	Gel Documentation GenoSmart	No.	2		
13	Horizontal Electrophoresis Apparatus	No.	2		
14	Inverted Microscope With Camera	No.	2		
15	Micro Wave Oven	No.	2		
16	Shaker Digital	No.	2		
17	UV-VIS Dual Beam 8 Auto Cell Scanning Spectrophotometer	No.	4		
18	Vertical Gel Electrophoresis Unit	No.	2		
19	Water Still Glass	No.	2		
20	Water Purification System	No.	2		
21	Anaerobic Jar	No.	1		
22	Microbiological safety cabinet Class II type A	No.	1		
23	Conductivity Meter	No.	5		
24	COOLED INCUBATOR	No.	1		
25	DIAREADER Universal NB	No.	2		
26	DIAWASHER II Microplate Washer	No.	1		
27	Fluorescence Microscope with Trinocular Head	No.	2		
28	4 Ft Laboratory Fume Hood Bench Top Model	No.	2		
29	Ultra Turrax T25basic Homogeniser	No.	2		
30	Laminar Air Flow (Vertical)	No.	2		
31	Lyophilizer / Freezer Dryer	No.	1		
32	Refrigerated Centrifuge Machine,	No.	1		
33	Thermal Cycler	No.	1		
34	Ultra-Sonifier	No.	1		
35	Fermenter 6.7 Liters	No.	1		
36	Ordinary Light Microscopes	No.	10		
37	Surgical Box Stainless steel,	No.	10		
38	Micro Dispenser (Single Channel)	No.	6		
39	Bp Apparatus Auto/ Manual,	No.	6		
40	Animal Cages,	No.	4		
41	Hot Air Oven	No.	3		
42	Incubator	No.	3		
43	Vortex	No.	3		
44	Homogenizer	No.	2		
45	pH Meter	No.	2		
46	Water Distillation Apparatus	No.	2		
47	Inverted Microscope	No.	2		

Annex VI-E: Bill of Cost- Equipment for Department of Microbiology & Physiology Lab

Sr. #	Description	Unit	Qty	Unit Price	Total Price
48	Micro Dispenser (Multi Channel)	No.	2		
49	Elisa Plate Reader	No.	2		
50	Power Lab	No.	1		
51	Hot Plate	No.	1		
52	Blood Autoanalyser	No.	1		
	Total				



Annex VI: Bill of Quantity(ies)
Annex VI-F: Bill of Cost - Equipment for Environmental Sciences Lab

Sr. #	Description	Unit	Qty	Unit Price	Total Price
1	Analytical Balance:	No.	5		
2	ISS perusal piously TDS Meter	No.	5		
3	Digital Sound Level Meter	No.	10		
4	Water Flow Meter	No.	5		
5	Digital titrators	No.	5		
6	Multimeter	No.	5		
7	Sulphur dioxide SO ₂	No.	4		
8	Oxides of Nitrogen as NO	No.	4		
9	Oxides of Nitrogen as NO ₂	No.	4		
10	Tropospheric Ozone O ₃	No.	4		
11	Suspended Particulate Matter SPM	No.	4		
12	Respirable Particulate Matter PM ₁₀	No.	4		
13	Digital CO Meter:	No.	4		
14	Portable Airborne Lead & Lead Dust Monitor	No.	4		
15	Portable CO ₂ Meter	No.	4		
16	Digital Sound Level Meter	No.	4		
17	Ultra Micro Balance	No.	4		
18	Distillation Unit	No.	4		
19	GARMIN GPS ETREX LEGEND HCX:	No.	3		
20	Light microscope	No.	3		
21	Centrifugation Machine (250 ml)	No.	3		
22	Gel electrophoresis tray	No.	3		
23	PENETROMETER Micrometric Vertical Adjustment.	No.	3		
24	POCKET PENETROMETER	No.	5		
25	Gel Documentation GenoSmart Digital Video System with Integral LCD Monitor	No.	2		
26	Stack/Flue Gas Analyzer	No.	2		
27	Eppendorf Micro centrifuges	No.	4		
28	Vortex Mixture	No.	2		
29	Orbital Shaker	No.	2		
30	Arc GIS License	No.	1		
31	Total Organic Carbon (TOC)	No.	1		
32	Atomic Absorption Spectrometer F/GF D 5863 - IP 285	No.	1		
33	Universal Mutation Detailer System	No.	1		
34	Autoanalyser-3 HR	No.	1		
35	Dionex Ion Chromatograph	No.	1		
36	Gas Analyser	No.	1		
37	Constant room temperature/Growth rooms	No.	1		
38	Cold room	No.	1		
39	Kjeldahl Distillation Unit:	No.	1		
40	Temperature control water bath	No.	1		
41	Water De-ionizer	No.	1		
42	Stereo Microscope	No.	2		
43	Nanodrop Spectrophotometer	No.	1		
44	Portable Total Suspended Solids (TSS) Meter	No.	3		
45	Chemical Oxygen Demand (COD) Meter	No.	1		
46	Biological Oxygen Demand (BOD) Meter	No.	1		

Annex VI-F: Bill of Cost - Equipment for Environmental Sciences Lab

Sr. #	Description	Unit	Qty	Unit Price	Total Price
	Total				

Annex VI: Bill of Quantity(ies)

Annex VI-G: Bill of Cost - Equipment for Food Science Lab

Sr. #	Description	Unit	Qty	Unit Price	Total Price
1	Fully Automatic Hematology Analyzer	No.	1		
2	Analytical Balance	No.	1		
3	Digital Brix Refractometer	No.	1		
4	Laboratory centrifuge	No.	2		
5	Colony Counter (BioCounter Automatic colony counter)	No.	1		
6	Micro quant Power 100-240 VAC 50/60 Hz	No.	1		
7	Laminar Cabinet Flow	No.	1		
8	Lacto scope compact	No.	1		
9	Hand Refractometer	No.	5		
10	pH Meter	No.	5		
11	Cheese Vat	No.	1		
12	Automatic Isoperibol Calorimeter with Oxygen Combustion Bomb, Oxygen Regulator, Nitrogen Regulator, Rinse Tank, 500 Firings Kit, Printer and Ribbon	No.	1		
13	Water Purification System Millipore	No.	1		
14	Unit Gel Electrophoresis Midi Horizontal	No.	1		
15	Rotary Evaporator	No.	1		
16	Low Temperature Freezer	No.	2		
17	Grinding Mill	No.	1		
18	Digital Weighing Balance	No.	5		
19	Small Scale Dehydrator	No.	1		
20	Fruit Grader	No.	1		
21	Ice Cream maker	No.	1		
22	Visco Meter	No.	2		
23	Amylogram/ Amylograph	No.	1		
24	Mixogram	No.	1		
25	Farinogram/ Farinograph	No.	1		
26	Fruit Sorter	No.	1		
27	FPLC (Fast Protein Liquid Chromatography)	No.	1		
28	Baking Line,	No.	1		
29	Digital Burette	No.	1		
30	Blood Shaker with accessories	No.	1		
31	Digital Stadiometer with accessories	No.	1		
32	Digital Body Composition Scale with accessories	No.	2		
33	G. C. Hb. Meters with accessories	No.	1		
34	Digital Peak Flow Meters with accessories	No.	1		
35	Digital Oxymeters with accessories	No.	1		
36	Pulse Rate Meter digital with accessories	No.	2		
37	Micropipettes with accessories	No.	1		
38	Multichannel Micropipettes	No.	2		
39	Ultra Temperature Controlled Freezer (-80 C),	No.	1		

Annex VI-G: Bill of Cost - Equipment for Food Science Lab

Sr. #	Description	Unit	Qty	Unit Price	Total Price
40	Positive Displacement Micropipettes	No.	1		
41	Vacuum Sealer Digital	No.	1		
42	Nitrogen Evaporator	No.	1		
43	Texture Analyzer	No.	1		
44	Fluorescence Detector	No.	1		
45	Ultrasound Assisted Extraction with accessories	No.	1		
46	Lyophilizer with all accessories	No.	1		
47	Pilot Plant for Fruit Dehydration	No.	1		
48	UHT Milk Production Unit	No.	1		
49	Pilot Plant for Juice Concentrates,	No.	1		
50	Pasteurization and Cooling Tanks	No.	1		
51	Spray Dryer	No.	1		
52	High Pressure Homogenizer	No.	1		
53	UV Spectrophotometer	No.	1		
54	Kjeltec Protein Estimation Unit,	No.	1		
55	Soxhlet Extraction Unit (6 Units)	No.	1		
56	Blanching and Washing unit,	No.	1		
57	Semi-Automatic Food Packaging Machine	No.	1		
58	Laboratory Muffle Furnace	No.	2		
59	Digital Flame Photometer	No.	1		
60	Water Deionization Unit	No.	1		
61	Bread and Pizza Proofer,	No.	1		
62	Fruit and Vegetable Cutting Tables	No.	4		
63	Hot Air Oven,	No.	3		
Total					



Annex VI: Bill of Quantity(ies)

Annex VI-H: Bill of Cost- Equipment for Bioinformatics & Biotechnology Lab

Sr. #	Description	Unit	Qty	Unit Price	Total Price
1.	Real Time PCR	No.	1		
2.	Nanodrop	No.	1		
3.	Ice Machine	No.	2		
4.	ELISA Reader	No.	1		
5.	Mini Protean Tetra Cell Gel electrophoresis apparatus	No.	1		
6.	Temperature controlled centrifuge machine	No.	1		
7.	Dry bath incubator,	No.	1		
8.	Mini tank Electrobloater	No.	1		
9.	Plant growth Chamber (Programmable),	No.	1		
10.	Freezer	No.	1		
11.	CO ₂ incubator	No.	1		
12.	Inverted microscope	No.	1		
13.	PCR machine,	No.	1		
14.	Laminar flow clean bench	No.	4		
15.	Tube incubator (1.5ml)	No.	3		
16.	Analytical balance	No.	3		
17.	Digital Pipetteman (complete set)	No.	3		
18.	Electrical balance	No.	3		
19.	Gel documentation System	No.	1		
20.	Incubator	No.	3		
21.	Magnetic stirrer	No.	3		
22.	pH meter	No.	3		
23.	Air conditioner (1.5 ton)	No.	6		
24.	Refrigerator (4°C, -20°C)	No.	3		
25.	Shaker Shaking/Mixing	No.	3		
26.	Vortex Mixing	No.	3		
27.	Water bath	No.	3		
28.	Autoclave machine (varying capacity)	No.	2		
29.	Glassware drying cabinet	No.	1		
30.	Liquid nitrogen tank	No.	1		
31.	Water double distillery	No.	1		
32.	Microscope (Compound/Light)	No.	4		
33.	Microwave Oven	No.	3		
34.	Mini spin Centrifuge	No.	3		
Total					

Annex VI: Bill of Quantity(ies)

Annex VI-I: Bill of Cost- Equipment for Central Hi-Tech Lab

Sr. #	Description	Unit	Qty	Unit Price	Total Price
1	Spectrophotometer double beam with accessories	No.	1		
2	H.P.L.C (Gradient System)	No.	1		
3	Atomic Absorption Spectrometer.	No.	1		
4	F.T.I.R Spectrometer	No.	1		
5	Inductive Couple Plasma (ICP)	No.	1		
6	Electric Muffle Furnace 1600C	No.	1		
7	Electric balance 0.01mg	No.	1		
8	ULTRA Centrifuge Machine	No.	1		
9	Rheometer 0.001 to 200mN.m	No.	1		
10	Single Crystal Diffractometer, 50Hz	No.	1		
11	APEX II 16 Megapixel Detector.	No.	1		
12	Kappa 4- axis Goniometer	No.	1		
13	Elemental Analyzer	No.	1		
14	Simultaneous DSC –TGA	No.	1		
15	Dynamic Mechanical Analyzer	No.	1		
16	Fully Automatic Amino acid analyzer: Fully automated, auto-sampler with 4x48 Standard vials or 4 micro plates, with inert gas supply	No.	1		
17	Dage 4000 Shear Tester	No.	1		
18	CNS Analyzer	No.	1		
19	Gas Chromatography	No.	1		
20	PCR Machine	No.	3		
21	XRD Powder System	No.	1		
22	pH Conductivity TDS Meter	No.	5		
Grand Total					

Annex- VII

Minimum Requirements for Service Level Agreement for Equipment and Maintenance

Following requirements for SLA apply to this RFP for this project.

1. Preventive maintenance in respect of system and its auxiliaries must be carried out atleast on semi annual basis.
2. The supplier will be required to pay periodic visits to the laboratories once in a quarter and submit report about functioning of the installed lab equipment/facility.
3. The supplier will be responsible for resolution of the reported issue as per agreed terms of SLA to ensure the proper working of the supplied equipment.
4. Maintaining of critical inventory of timely supply/fault removal of supplied system will be responsibility of the supplier of equipment.
5. Timely compliance of scheduled maintenance of the equipment will be responsibility of the supplier.

(B) Warranty/Operation and Maintenance Services					
S.No	Item	Description	Minimum Years of SLA	Service Charges (Quote per year) (m)	Total Service Charges (m x 2)
	Warranty/ Operation and Maintenance Services	As per requirement mention in "Technical Requirements" Form-I, Item-"J" and its sub-clauses.	2		
Subtotal of "B"					
Total/ Bid Value Total = (A + B)					

Abbas

Annex VIII

Technical Compliance Certificates/Compliance Undertaking

I, (Name); (CNIC#); (Designation), (Company Name) have gone through the Terms/Conditions of this RFP and have found the document in whole as non-biased to any particular vendor or product/brand. I here by undertake and firmly bound myself to abide by/comply all sections of this RFP except for those items noted below.

1.

2.

3.

4.

5.

....

Signature

Name

Designation

Company

Date

Annex IX

Lab Equipment Description and Specification

A-Equipment for Chemistry Lab

Sr.#	Description and Specification	Qty
1	pH, Conductivity TDS Meter: Easy to use portable instruments for field measurements of pH, conductivity and TDS in water conditioning applications. Reduce your necessary tool set for field water-quality analysis. HI 9812-0 measures pH from 0.0 to 14.0. This meter also checks conductivity and TDS from 0 to 1990 mg/L, ideal for the water conditioning field. Calibration has been simplified to one point for both pH and conductivity/TDS modes. Range pH 0.0 to 14.0 pH, Range EC 0 to 1990 μ S/cm, Range TDS 0 to 1990 ppm	5
2	Hotplate with Stirrer: Plate Size: 180x180 mm, Stirring capacity (H ₂ O): Max. 20 liters. Motor Rating: 9/4 W, Speed control resolution: 5 rpm, Speed range: 80 ~ 1,500 rpm, Temp. range 380 max.	10
3	Water Still Merit: Output 4 liters/hour single distilled with bench/wall mounting stand. Overall 500 x 150 x 450mm high. For 240V 50/60Hz single phase supplies. Rating 3kW.	5
4	Conductometer: Date and Time display, 3-in-1 pH electrode/4-ring conductivity electrode, Auto buffer recognition, with 3-point calibration, Auto functions: ATC, auto self-diagnosis, STARTER Series products are manufactured at ISO9001 facilities, and meet CE requirements, Auto/manual Endpoint modes, two modes can be switched for different situations, Measurement range: 0.0 μ S/cm...1999.9 mS/cm, Resolution: Auto range, 0.1°C, Error Limits: $\pm$ 0.5 % F.S. $\pm$ 0.3 °C, Power/Battery: 100-220V/50-60Hz, 9 V DC, Display: White backlight liquid crystal, Input: Mini-Din	3
5	UV Lamp: With a flow rate of 1.8 cubic meter per hour and an ultimate vacuum of below 10 mbar, it covers a wide range of classical laboratory applications and is optimally suited for work with a rotary evaporator. Other typical applications include the evacuation of drying ovens or vacuum centrifuges and the generation of vacuum for filtration purposes	5
6	Analytical Balance: Capacity: 210 gram Readability: 0.1 mg	4
7	Digital Oven: Int. 370x350x320mm WxDxH, Ext. 518x597x740mm WxDxH, Capacity: 50 liters, Heater: 0.9 kW, Temp. Range: Ambient +5°C to 250°C, Accuracy: $\pm$ 0.3°C	3
8	Electrically Heated Muffle Furnace: Max. Operating Temp. 1200 °C, Volume: 15 litres, Power rating: 3.6 kW, Supply voltage: 1 x 230 V, Inner dimensions: 230x340x170mm (WxDxH)	3
9	Water Bath: Bath: 500 x 295 x 150mm WxDxH, Ext. 536 x 335 x 260 mm WxDxH, Heater 2 kW Capacity: 22 liters Temp. Range: Ambient +5°C ~ 100°C, Accuracy: $\pm$ 0.1°C	2
10	Rotatory Evaporator System: R-210, Vacuum Pump V-700 and controller V-850, and Gesticulators Chiller F-100	2
11	Spectro UV-VIS Dual Beam and Auto Cell Scanning Spectrophotometer: Optical System: Dual Beam, Wavelength range: 190 nm ~ 1100 nm, Spectral bandwidth: 2.0 nm, Stray Light: 0.2%T (220nm and 340nm), Wavelength accuracy: 0.5 nm (with automatic wavelength correction), Wavelength Reproducibility: 0.2 nm	2
12	UV Single Beam Spectrophotometer: Has a 2nm. Bandwidth UV-Visible and scanning, Spectrophotometer. Wavelength 190-1100 with 4 cell holder. Included in the package: Windows XP/Vista compatible Software, 4 Glass cells (10mm.) 2 Quartz cells (10mm.) Built in RS-232 PC connection interface. Software Manual,	2
13	FTIR spectrometer (bench-top): Starter Kit for sampling liquids and solids, to include sealed demountable liquid cell, 2 x KBr Windows, set of Teflon spacers, simple sample press for KBr sample pellets, agate pestle & mortar, KBr powder, nujol oil, universal sampler holder, polystyrene transmission check card, Wavelength range, IR: 7800 to 380 cm ⁻¹ , Wavelength range, NIR 15000 to 3850 cm ⁻¹ , Spectral Resolution (optional): 0.5 cm ⁻¹ , Interferometer: Self aligning, Beamsplitter, standard IR: Multicoated KBr, Sample compartment: W20xD26xH16 cm,	1



B- Equipment for Department of Zoology (Wildlife & Fisheries) Lab

Sr. #	Specification	Qty
1	Walk-in Cold Room 10'x10'x10' WALK-IN COLD ROOMS. Matrix. Advanced technology, due to persistent investments in R&D. A perfect combination of a well-conceived design and highly functional product. Support configuration systems and modular products. An extensive distributor network deeply committed offering the best service available.	1
2	Camera fitted Light microscope with monitors and accessories. Transmitted and reflected metallurgical microscopes are equipped with vertical illuminator, transmitted illuminator, plan objectives, wide field eyepieces, clear and high-contrast image and set polarizer device in trinocular. Transmitted and reflected metallurgical microscopes are suitable for observing and analysis samples of minuteness and hard to inverted, and need look for samples in the special range. Specifications: Eyepieces Type: Wide, Magnification: 10X, Field (mm) 16 dia	1
3	Inverted Microscope with monitors and accessories All buttons and control switches for motorized operation are designed considering ease of operation, visibility and understandability. High-speed motorized XY stage and Z-axis.	2
4	Autoclave Horizontal (large size) Bench top autoclave offer fast, safe, dependable and convenient steam sterilization. 316-L stainless steel chamber with a safe and durable design. Temperature selection is from 100-134oC. Exhaust adjustable for sterilization of solids and liquids and drying cycle remove residual moisture after sterilization. Heat insulated, double locking door against accidental burns.	1
5	Telescope Saxon90 mm, Terrestrial Refractor Telescope	5
6	Night Vision Equipment Company American Eagle Pocketscope NVEC Land Systems - Observation And Surveillance - Image Intensifier Monoculars The American Eagle pocket scope is a combination of night viewer and still or video camera night lens which incorporates automatic brightness control. Each instrument is equipped with a high quality eyepiece, carrying case, a x1 25mm objective lens (x2, x3 optional) and two alkaline batteries. Four versions of the pocketscope are available and have either commercial specification second-generation, second-generation plus or third-generation image intensifier tubes.	2
7	Shaker incubator Built in timer automatically shuts off, unique raised heating system Program incubator with built in RS 232 interface and included software inner glass door, Electronic PID control, 3 Digit Colored LEDs display. Capacity 3.8 Cu ft, shelf: 5 Power: 220 V, 900 Watts, Temperature: 30 to 70 C, Accuracy: +/- 0.1 C, Uniformity: +/- 0.5 C, Resolution: 0.1 C,	2
8	Radio Telemetry Complete Apparatus GPS Systems/Collars, Weighs just 825 grams Receive up to 96 locations fixes per day, up to 6 e-mails a day Long life: 5 years @ 3 locations/day 1.6 years @ 12 locations/day Remotely commanded release via e-mail Remotely modified user selectable location and data transmission schedule • Low battery "fail safe" collar release • Collar is refurbishable to maximize investment • Optional aluminum case for difficult applications	2
9	Glass distillation plant complete with accessories. Output: 20 ltr/hr Electrical Power 220/240 Volts, 50 - 60 Hz, Single Phase, 3 KW Silica heater Cooling water required 1-2 lit/min Min. Pressure 3 psi, Weight 8-16 kgs	5
10	Electronic balance (four Digit)	3
11	Water bath (Temperature controlled) Dimensions: Bath: 500 x 295 x 150mm WxDxH, Ext. 536 x 335 x 260 mm WxDxH Heater 2 kW, Capacity: 22 liters Temp. Range: Ambient +5°C - 100°C, Accuracy: ±0.1°C	1



12	Refrigerators (12 cubic feet with stabilizer) Temperature 2 °C - 8 °C, Accuracy ± 0.5 °C, Volume 350 ltrs. (12 cubic fit), No. of Baskets Five. Operating Voltage 230V AC	3
13	Homogeniser Particle reduction down to 1 μ m. Operating range up to 2.5 liters. With Integral variable electronic speed control. Maximum speed 24000 rev/min. Overall 75 x 60 x 250 mm. For 230 V, 50/60 Hz. Single phase suppliers.	1
14	Vortex Is a general purpose mixer for applications that demand vigorous and uniform vortexing. Variable analog speed control of 100 to 3200 rpm (± 25 rpm) with low rpm start-up allows gradual, gentle shaking of samples. The unit may alternatively be operated in "touch" (AUTO) mode. Rubber feet and a heavy base ensure that the unit won't "walk away" during use. A cup head and a 3" dimpled platform are included with each unit.	4
15	Ice Flake Maker Freezing system: Drum rotation freezing jet system, Power: 220V (240V) / 50-60HZ, Production capability: 200- 250Kg, Produce Condition: snow Refrigerant: R-22, or R-404A Machine	1
16	DO Meter	4
17	pH Meter (digital bench model) pH range 2 to 19.999, resolution 0.01, accuracy ± 0.003 , mV range ± 1999 mV, manual Temperature, comp 32-212°F, epoxy body combination pH electrode, , 4, 7 and 10 pH capsules, swing arm stand, power 9V power supply.	4
18	EC Meter (digital bench model)	4
19	Vacuum Oven Medium size with temperature range 0-250°C, Electric supply 220-240V	1
20	Vacuum Pumps Motor driven pumps completely mounted on rectangular base plate and furnished with V belt, Single stage. S-25 Displacement 25L/Min, Motor H.P. 0.25. Air Displacement 200 Liters / Minutes Optional Accessories: a) Moisture Trap. b) Vacuum Gauge with Regulator. c) Non Return Valve.	2
21	Light meter	2
22	Turbidity Meter	2
23	UV lamps UV-light wavelength: 312 nm UV-light intensity variable Viewing area size - 11 x 14 cm UV protection shield for safety UV Mini 11 x 14 cm filter size, 4 x 6 W UV-bulbs (312 nm) with intensity switch; including UV-protecting shield.	2
24	Drying Cabinet Timed Dry Cycle: up to 4 hours Three temperature options	1
25	Precision pipettes (5, 10, 20, 100, 200, 1000 μl) Micropipet, adjustable volume, 0.5-10 μ l. Micropipet, adjustable volume, 2-20 μ l. Micropipet, adjustable volume, 20-200 μ l. Micropipet, adjustable volume, 100-1,000 μ l.	5
26	Freezer (-20 °C) Size: 125, 300, 500, 750 Liters Standby secondary refrigeration system. Automatic change over feature. Temperature monitoring (Recorder / Logger / Computer interface). Power failure Alarm Condenser failure alarm Door open alarm Alarm system with battery backup Other features as required.	2
27	Blenders (various processing capacities) High Throughput, No Cross Contamination, Samples stay cool, Convenient, Risk Free.	3
28	Liquid nitrogen flasks (Dewar) Max Cont. liter: 1 - 10 Holding time days: 5-16 Evaporation rate l/day: 0.2-0.6	3
29	Microwave oven Size: 20L/36L/52L	3
30	Automatic air compressor	4
31	Oxygen Cylinder 48 CFT with trolley	5

32	Microtome with accessories Visual display Range of section thickness: 1 - 60µm, Hand wheel: Hand wheel Lock: Positive lock at 12 or 6 o'clock position, Knife Holder Base: Displacement: Lateral Displacement Adjustments: North-south Adjustment Clamping Mechanism : Clockwise Microtome Knives of size 100MM - 300MM, Disposable Blade: Can be used with blade holder, Reverse Wheel: Function: Trimming	1
33	Chlorophyll extraction with filtration assembly vacuum pump, and accessories Millipore 47 mm and 25 mm filtration assembly with vacuum pump (Hg 5 lb)	1
34	Automatic tissue processor Safety device to protect tissues in wax during electric failures. Basket rotar with motor for slow turning of specimen basket. Wax bath thermostatically controlled. Wax bath controlled by digital temperature controller cum indicator. Tissue basket of Stainless Steel for holding tissue containers. Tissue containers made from Stainless Steel of 36mm dia with spring clips: Set of 6. Timing disc calibrated for 24 hrs. Specimen Beaker. ACCESSORIES Wax Bath: 2 nos., Stainless Steel Basket: 1 no., Tissue Containers: 10 nos. 24 Hr. timing calibrated timing: 6 nos., Dust Cover, Basket Rotar	1
35	Biohazard safety cabinets (Class II) Bio-safety cabinets available in Stainless steel and GI with PU coated construction. Worktables of removable type and suitable for oven baking. Inner surface completely line with stainless steel. HEPA filters of Miniplate type. Differential pressure monitored through specially designed low-pressure gauges. Working chamber provided with UV & Illumination tubes. Feather-touch control switch with indicators provided for the operations of blower / illumination / UV, available with various optional Special features.	1
36	Embedding center	1
37	Incubator Temperature control: microprocessor temperature controller Temperature range: 05 C above ambient to 80 C Temperature accuracy: ± 0.1 C Temperature uniformity: ± 0.5 at 37 C, Circulation: forced filtered air., Chamber material: stainless steel., Programmable upto 99 hours and 59 minutes Power requirements: 220VAC, 50/60Hz single phase	1
38	Laminar flow Vertical/horizontal. Power consumption (Watts) 525 Fluorescent lights (Watts) 3x40 Ultra violet lights 36, Power socket (Amps) 15, Net Weight (Kg) approx. 350	1
39	4 Ft Laboratory Fume Hood Bench Top Model Overall dimension: 52Wx54Hx 24D inches Appr. Working dimension: 47Wx36Hx 22D inches Appr External construction: Oven baked epoxy painted MS.	1
40	Hot plate /stirrer Plate size: 180x180 mm, Stirring capacity (H2O): Max. 20 liters Motor Rating: 9/4 W, Speed range: 80 ~ 1,500 rpm, Temp. range: 380 max.	2
41	Pipette Automatic Automatic, portable, battery-powered pipet pump equipped with a tissue culture nosepiece incorporating a dual hydrophilic, hydrophobic 0.8 µm filter to prevent cross-contamination. Run for two hours (pipetting 2,000 times) without recharging. Supplied with 4 replacement filters. Safe, convenient instruments for converting pipettes into hand-operated dispensers. Can be used with glass or plastic pipettes ranging in size from 1 to 100 ml.	2
42	High speed re refrigerated centrifuge with accessories Ultracentrifuge, a sophisticated on-board computer, enhanced firmware, powerful software and an easy-to-use touch screen, optimized user efficiencies, far greater capabilities and faster turnarounds.	1
43	Protein Electrophoresis apparatus with all accessories Protein Vertical Electrophoresis Apparatus: Two 9 x 10 cm Gels (20 Samples), Seamless Injection-Molded Base, Safety Interlock Cover, Unique Gel Clip Design Flexibility And Allow Use of Most Prepared Polyacrylamide Gels, Corrosion Resistant All-Platinum Electrodes, Safety Insulated Electrical Leads, Polyacrylamide Gels (12%)-6 gels	1
44	Microplate reader with accessories Plate reader a practical mid-throughput solution for laboratory automation.	1

45	Spectrophotometer with all accessories Wavelength combination of 200-1000 nm. Featuring two large, easy to read digital LCD displays for wavelength and mode readout, accurate 5 nm band pass, an RS-232 interface, Four modes: T = transmittance, A = absorbance, C = concentration & F = factor, auto-zero function and the sample compartment comes standard with a 4-cell square cuvette holder for 10 mm cuvettes allowing to insert a reference standard and samples. The compartment can accept cuvettes up to 100 mm in path length. Power supply may be switched: 100 V or 220 V. Operated by panel controls or through a PC using the optional application software.	1
46	Cryotome with all accessories Temperature Range, Cryochamber: -35 to 0°C (-31 to 32°F) Temperature Range, Cryobar: -55°C (-67°F) to chamber temperature Temperature Range, Specimen Head (14011-026 only): -40 to 0°C (-40 to 32°F) (within ±10°C of chamber temperature), Temperature Range, Electrical: 115V, 60Hz	1
47	Bench top orbital shaker The Digital Orbital Shaker ideally suited for the most precise sample incubation and gel de-staining. Digitally controlled RPM is from 40-350. Additional digital features include continuous run and pre-set run modes. The unit includes a 12" x 12" platform with skid-free sample pad.	1
48	DNA concentration System with accessories Ultra Purified DNA in Less Than 20 minutes Suitable for All Molecular Biology Applications DNA Purification, Concentration and Desalting from Agarose Gel Slices Using Beads or Spin Columns	1
49	Hybridization oven Temperature Range: Ambient +8°C - 85°C, Selection: Digital, Display: LED Uniformity: ±0.25°C Safety Over Temp. Cut Out: Yes Capacity (medium bottles) : 14 Shaking Platform : Yes Shaking Action : Orbital & linear Variable Speed Rotisserie : Yes Variable Axis Rotisserie : Yes Rotisserie Speed : 5-15 rpm Platform Carrying Capacity : 4-10 kg Maximum Power : 250 W	1
50	Microfuge high speed centrifuge machine High-volume, fixed-angle rotor for initial processing of tissue homogenate and other large particles. Maximum Speed 10,000 RPM; Maximum Volume 3 L; Number of Tubes x Nominal Capacity (ml) of Largest Tube 6 x 500.	1
51	Hydro Tech Gel Drying System This HydroTech gel drying system, 220-240 V, includes Model 583 gel dryer, HydroTech vacuum pump, and instructions. The Model 583 gel dryer is a vacuum-based gel dryer with a drying surface of 35 x 45 cm with variable temperature control and three preprogrammed cycles.	1
52	Sonicator Four-channel combination Microprocessor-controlled; provide interferential, premodulated, medium frequency, symmetrical biphasic, high-volt and microcurrent waveforms with enhanced reliability and offer 1 and 3 MHz ultrasound using a variety of interchangeable applicators. Include standard 5 cm ² dual-frequency applicator	1
53	Vacuum Pump Motor driven pumps completely mounted on rectangular base plate and furnished with V belt, Single stage. S-25 Displacement 25L/Min, Motor H.P. 0.25. Air Displacement 200 Liters / Minutes Optional Accessories: - a) Moisture Trap. b) Vacuum Gauge with Regulator. c) Non Return Valve.	1
54	Vacuum Blotting system Semi-Dry Blotting System. 20cm x 20cm. System transfers Western, Northern, or Southern gels reliably and quickly. The stainless steel cathode and platinum-coated titanium anode durable and corrosion free. Complete with two Mylar shields, safety-tip power leads and interlocking safety cover.	1
55	Eye wash station Secondary Eye Wash Station Size: 14 x 19 x 5", Capacity: 64 oz.	2
56	Polaroid gel documentation system DS-34 fixed focal length camera, two sizes of hoods, and a mini-transilluminator, enabling quick images right at the bench. Each system with a filter for use with ethidium bromide-stained gels.	2
57	96-Well PCR Thermal Cyclers (Thermocyclers)	1
58	Trays for gels	3
59	Lab Twin Screw Extruder Building block structure, Assembled barrel, Two-way temperature control, wide temperature range, pressure points, Screw speed and wide adjusting range, all set can be automatic controlled, adapt to various raw material for testing, easy to operate, easy maintenance.	1

60	Tecator Soxtec 1043 mit Service Unit 1046 Foss/Tecator Extraction unit 1043. With control unit. 6-flame. 220 V. 1500 W.	1
61	Flame spectrophotometer	1
62	Micro Kjeldhal Apparatus for protein estimation	1
63	Electrically Heated Muffle Furnace Max. Operating Temp. 1200 °C, Volume: 15 litres Weight: 55 kgs, Power rating: 3,6 kW Supply voltage: 1 x 230 V, Inner dimensions: 230x340x170mm (WxDxH) Outer dimensions: 480x650x570mm (WxDxH) 40 segments Programmable start time	1
64	Feed mixture one ton capacity semi automatic	1
65	Liquid Nitrogen cylinder Liquid Nitrogen, 240 Liters 22PSI With Liquid Electronic Display Liquid Nitrogen, Cylinder Size 20 Cuft Nitrogen, Size 250 Nitrogen Industrial Size 4k	2
66	Sieve shaker Mechanical with sieves set ASTM Suitable when large quantities of material must be sieved. The highest sieve can contain up to 60 to 70 kg of material (approx. 30 liters). The main features of this sieve shaker are its sturdy construction and the fact that each sieve is blocked individually and can thus be easily extracted. The sieve shaker can hold 6 sieves and a receiver. Dustpan door (plexiglass) supplied. Supplied with receiver pan but without sieves. Power: 220 V, 50 Hz, single phase	1
67	Magnetic Stirrer Plate Size: 180x180 mm, Stirring capacity (H2O): Max. 20 liters Motor Rating: 9/4 W, Speed control resolution: 5 rpm Speed range: 80 ~ 1,500 rpm, Temp. range: 380 max.°	2
68	Incubator for BOD	10
69	Biofilter	1
70	Fiber glass tanks	2
71	Pressure Chamber & Osmometer Linearity: Less than $\pm 1\%$ from a straight line over calibrated range Repeatability: 0 to 400 mOsm: ± 2 mOsm/kg (1 S.D.) 400 to 2000 mOsm: $\pm 0.5\%$ (1 S.D.) Drift: Less than 1 mOsm/kg H2O per month, Temperature Effects: Less than 1 mOsm/kg H2O for every 5°C (9°F) ambient temperature change Operating Conditions Temperature: 18°C to 35°C (64°F to 95°F)	1
72	Chlorophyll Content Meter Resolution: 0.1 CCI unit, Repeatability: $\pm 1\%$, Sampling acquisition time: 2-3 seconds, Source: Custom 2 wavelength LED module	5
73	Yukon Electric - Electric/Wood/Coal Furnace Yukon, Grate options: Standard Wood Grates	1

C-Equipment for Department of Physics Lab

Sr #	Description and Specification	Qty
1	Oscilloscopes 20MHz 220 V AC 50-60 Hz Required for experiments and research related to electronics.	15
2	Audio Generator 10 Hz to 1 MHz Attenuator 0 dB to -40dB sine wave / square wave Required for experiments and research related to electronics.	15
3	Analog Digital Trainer Variable VDC +20V regulated VDC $\pm$ 5V function generator data switches level switches digital display digital VOA meter Required for experiments and research related to electronics.	15
4	Digital Multimeter 200 mV - 1000 V 10A Required for experiments and research related to electronics.	15
5	Bench-type Top LCD Digital Multimeter Required for EMT, Electronic and Modern Physics Labs.	10
6	Fluke 8846A Digital Benchtop Multimeter, 6.5 Digit, 1000VAC	5
7	Datalogging Heavy Duty Light Detector Required for experiments and research related to electronics.	5
8	Analytical Balance Micro rays (0.1 mg) Required for accurately weighing different compounds.	3
9	Gas Flow Meter 500 sccm per minutes (standard cubic cm)	3
10	Mortar Pestle (3set) Required for grinding the nanoparticles	3
11	Laser Power Meter	2
12	Adventurer Electronic Balance Capacity: 310 grams Readability: 0.001 gram Repeatability 0.001 gram (Std. Dev.): Linearity: $\pm$ 0.002 gram Calibration, LCD (3 high) Pan Size (cm): 10 diameter	2
13	LCR Meter frequency from KHz -MHz Required for the measurement of electric properties of the nanoparticles.	2
14	Constant current and voltage power supply Required for experiments related to electronics.	2
15	Cryostat for Liquid Nitrogen of capacity 35 ltr Required for storage of liquid nitrogen capacity.	2
16	Temperature Controller Required for controlling temperature.	2
17	Oscilloscope (dual trace 4 channel) with GPIB interface and software for data acquisition The oscilloscope with GPIB interface is an essential component of the data acquisition system. It is impossible to record the data without getting the signal first on an oscilloscope.	2
18	Magnetic Stirrer Required for arrangement at variable speed stirring for mixing of the solution.	2
19	Water Bath Capacity 15 liter Ambient +5-100°C Power: 230V 50HZ A.C. and Read Thermostat and Digital Display.	2
20	Thermal cycling oven Required for thermal cycling range from -25°C to 125°C	2
21	Nd YAG laser (solid state laser with first second and third harmonic generations) YAG Laser with Amplifier Specifications: Energy: 1000 mJ, Wavelength: 1.064 μ m, Pulse duration: 10 ns, Repetition rate: 100 Hz With second harmonics generator (Energy 500 mJ at 532 nm), With third harmonic generator (energy 250 mJ at 355 nm), With fourth harmonic generator (Energy 125 mJ at 266 nm) Temperature stability with integrated wavelength, Interfacing and fully computer control and optional software managements. Water / air cooling system All harmonic generators should be in compact module including the non linear crystal and removable set of dichroic mirror 0.5 mW He. Ne laser.	1
22	Spectrometer Spectrometer range: 200-980 nm Resolution: 0.1 nm (FWHM), Detection: CCDs with a combined 14,336 pixels Frame rate: 500 Hz capability, computer-controlled, Integration time: 1 ms; variable in free-run mode Trigger delay: -121 μ s to +135 μ s in 500 ns steps, user-configured Trigger jitter: $\pm$ 20 ns Trigger level: TTL not to exceed 5.5 V	1



23	Turbo molecular pump, rotary pump, vacuum gauges, Digital vacuum display meter Turbomolecular Pumping Systems Adixen Are the most reliable and cost-effective means of producing high vacuum. Portable, fast-starting, and require minimal time to install. Due to a flexible design, the Adixen Turbomolecular Pumping Systems are available in a wide variety of system configurations and performance options. Adixen Turbomolecular Pumping Systems combine an Adixen Turbomolecular Pump (ATP Series) from 80-400 l/s and a Pascal Series Rotary Vane Pump from 5-21 m ³ /h or an ACP dry pump from 15-40 m ³ /h. These components have an excellent reputation for performance, low vibration, reliability and easy field maintainability. Built-in flexibility: • Compact, for installation on a workbench or inside an instrument.	1
25	FC-3000 Flip Chip Bonder Required for chip bonding using flip chip method AutoCollimator: Optical Device Used to Help make Optical device and arm parallel to one another. UBA: Universal Bonding Arm designed for wide range of application with force upto 50 KG air less. Chuck: The current default six-inch chuck configured for high force use. Chip Flipper: MicroLab FC has this option installed. The chip flipper is component that essentially picks up a die from the chip and rotate it 180 degree.	1
26	Delay Generator Required to study the dynamic of plume for different delay times after its generation.	1
27	Vacuum Chamber with 7 ports, Chamber stand and other Accessories for vacuum Chamber and accessories Vacuum Chamber is required to perform the ablation experiment in vacuum.	1
28	Optics for laser, Optics table, magnetic mounts etc. A) Optics for Laser : I. Laser mirrors for 1064 nm 6 pcs packing II. Laser mirrors for 532 nm 6pcs packing III. Laser mirrors for 355 nm 6 pcs packing IV. Laser beam splitter 12 pcs packing V. Neutral density filters for laser 2 set VI. High energy laser polarizer 3 pcs packing VII. Plano convex lenses for laser 6 pcs packing VIII. Right angle prism 6 pcs packing IX. Achromatic Laser Lenses 6 pcs packing X. Aspheric Laser Lenses 6 pcs packing XI. Spherical Laser Lenses 6 pcs packing XII. Cylindrical Laser Lenses 6 pcs packing XIII. Convex Laser Lenses 6 pcs packing B) Optics Table : Height Options: L x W x H (4ft x 5ft x 8 ft) C) Magnetic Mounts 12 Pcs	1
29	Vacuum chamber Diameter 1 1/2 ft + 2 ft Vacuum Chamber, Pyrex Bell Jars, Cylindrical Chambers Spherical Chambers, Box Chambers	1
30	High temperature furnace with compatible crucible box type (1600 °C)	1
31	Ball Mill Required to grind crushed materials into extremely fine powder. Air Sampler Required for collect the aerosols for studying their physical properties.	1
32	Hydraulic press (20 ton) Required for the pelletization of nanoparticles under controlled uniform pressure.	1
33	Oven (200 °C) Required for heating and drying of materials and instruments.	1
34	Centrifuge Machine Ultra - 50000 RPM required to separate suspensions in liquids (to separate low and high density particles)	1
35	Portable Metal Hardness Tester, Brinell, Rockwell, Vickers, Shore, Required to check the metal hardness.	1
36	Microcontroller Burner And Programmer Universal burner and programmer for atmel and Pic microcontroller Required for experiments related to electronics.	1
37	Solar Power System	1

	500W Solar Panel 500 Ah Dry battery 25A charge controller 1000W Required for experiments and research related to electronics and solar system.	
38	WIEN2k Software The program package WIEN2k allows to perform electronic structure calculations of solids using density functional theory (DFT). It is based on the full-potential (linearized) augmented plane-wave ((L)APW) + local orbitals (lo) method, one among the most accurate schemes for band structure calculations. Software Already being used for condensed matter physics research (DFT calculations). A registered version is essential to boost software's potentials and quality of papers. Licensed software needed.	1
39	Humidity chamber up 90% RH Required to get results in humid environment.	1

D- Equipment for Applied Chemistry Lab

Sr. #	Description and specifications	Qty
1	Differential scanning calorimeter (DSC), with Mass Flow, 1 μ W sensitivity, Operating temperature 725 to -180 $^{\circ}$ C.,	1
2	Thermo-mechanical Analyzer with Mass Flow, Standard Operating Modes, Temperature Range is -150 to 1000 $^{\circ}$ C	1
3	Oven (Digital) Temperature range 0-300 $^{\circ}$ C, Capacity 50 liters, heater 0.9Kw	2
4	Analytical balance Capacity: 210 g, readability 0.1 mg	3
5	GC-MS, ECD detector With different columns with modern analysis With variables bores and nature of coating	1
6	Air Conditioner (1.5 ton) for constant room temperature	3
7	Optical microscope	1
8	Rotatory evaporator	2
9	Water deionizer, (50 litre/hour capacity)	1



E- Equipment for Department of Microbiology & Physiology Lab

Sr No.	Equipment Name & Specification	Qty
1	Micro Dispenser: Single Channel: 0-10uL, 10-100uL, 100-100uL	6
2	Portable Balance: Capacity: 600 grams, Readability: 0.01 gram	5
3	Egg Candler: Local Made	5
4	Colony Counter, Digital : With peripheral illumination and sloping front to reduce operator fatigue, zero/reset/average keys, mains switch and count pressure sensitivity control. Supplied with one Wolfhuegel graticule, dish centring adapters for 50 to 90mm diameter dishes, a USB interface and cable, and one segmentation disc. Without magnifier. Overall 310 x 300 x 140mm W x D x H (without magnifier). Weight 1.5kg. For 230V 50Hz, single phase supplies.	4
5	Staining Rack: 86x695x21 mm	4
6	Water Bath : Ambient +5-100°C 15L, 230V 50Hz A.C. and read Thermostat And Digital Display, Capacity: 15 Liters.	4
7	Phase Contrast Microscope: With Camera With all accessories, with cover boxes and cleaning solutions	3
8	Refrigerator: 586 Lit, HRB 701-F	3
9	AUTOCLAVE : Gross Capacity: 41qt / 39 liters, Power: 240V, 50 Hz 1650 Watts	2
10	Centrifuge: With continuously variable speed range 500 to 6000rpm and time 0 to 99 minutes. Pulse mode setting from 1 to 90 seconds. Maximum ref 3800xg. Without rotor or accessories. For 230V 50/60Hz single phase supplies.	2
11	Micro Filtration Apparatus: With Solvent Pickup Adapter, Eliminates the pouring of HPLC solvents by using a solvent pick-up adapter to draw solvent directly from a reagent bottle through a 47 mmfilter. Features the HI-Vac valve on the solvent pickup adapter that can be turned off for vacuum degassing, Complete Assembly, 1000 ml flask. Hose connection: # 2. Joints: 40/35	2
12	Gel Documentation GenoSmart: Digital Video System with Integral LCD Monitor, With computer accessories	2
13	Horizontal Electrophoresis Apparatus: With power supply	2
14	Inverted Microscope With Camera: With all accessories (Computer and Software)	2
15	Micro Wave Oven Capacity: 56 liters: Capacity: 56 liters	2
16	Shaker: Digital	2
17	UV-VIS Dual Beam 8 Auto Cell Scanning Spectrophotometer: Optical System: Dual Beam Wavelength range: 190 nm – 1100 nm Spectral bandwidth: 2.0 nm Stray Light: 0.2%T (220nm and 340nm) Wavelength accuracy: 0.5 nm (with automatic wavelength correction). Reproducibility: 0.2 nm 8 Auto Cell Holder, 8 Optical glass cell 10mm 2 Quartz Cell 10 mm 1 Cable , 1 Software and Cable, 1 Dust Cover, 1 Instruction Manual	4
18	Vertical Gel Electrophoresis Unit: For up to four 10 x 10cm gels. Supplied with four plain glass plates with bonded 1mm thick spacers, one dummy plate, two 12-well 1mm thick sample combs, casting base with soft silicone seals, cover, shrouded power supply leads and a cooling gel pack which can be used to reduce running times and enhance resolution.	2
19	Water Still Glass: Output 4 liters/hour single distilled with bench/wall mounting stand. Overall 500 x 150 x 450mm high. For 240V 50/60Hz single phase supplies. Rating 3kW.- Long life metal sheathed heater. - Safety thermostat protects still in the event of water supply failure - - Pyrex glass boiler and double coil condenser - - Plumbing connections via screwthread connectors.	2
20	Water Purification System : Accessories: Cartridge milli-di – long pack DI Pak for NP Analysis, 0.2um filter adaptor for Milli-DI	2
21	Anaerobic Jar : Polycarbonate jar, 3.5 liter capacity which accepts 12 x 90 mm plastic petri dishes. The yoke lid clamp has center wheel tightening with pressure gauge, automatic safety valve, Schrader inlet and outlet valves, low temperature catalyst, and dish carrier.	1
22	Microbiological Safety Cabinet Class II Type A: This high security cabinet provides product, personal and environment protection. Overall dimension: WxHxD 1300x1350x650 mm App Working dimension: WxHxD 1150x675x550 mm App Interior Construction: - 100% 304 stainless steel interior work area	1



	- Built-in water and gas inlets - Electric plugs for instrument - Regulated air supply - System with blowers - Double wall body construction for air circulation - Grated work surface - Unitized one piece interior side and rear wall construction - UV & Fluorescent lights - Main and exhaust Hepa filters - Efficiency: 99.9995% @0.12micron Exterior Construction: - 100% 18-gauge cold rolled steel prime and furnished in textured polyurethane - Moveable safety glass window. - All function control - Pressure gauge. - Time elapsed meter. - Exhaust duct.	
23	Conductivity Meter : Conductivity: 0 to 1999mS (0.001µS to 1mS*), 0 to 19.99S (0.01S), Conductivity ±0.5% ±2 digits, Salinity: 0 to 99.9g/l (0.1).	5
24	COOLED INCUBATOR : Temperature range 0 to +60°C u Stainless steel interior and exterior Microprocessor controlled programmer, fan circulation. Temperature fluctuation ±0.1°C (at 37°C). Inner glass door*, Capacity liters 53, Power rating W 450, With fuzzy logic, microprocessor PID controller with weekly programmer and daily schedule functions setting of up to 40 ramps with 1 minute to 999 hour segments, an alphanumeric, 8-digit display and Internal 1024kb memory for GLP-compliant archive documentation output of all relevant data.	1
25	DIAREADER Universal NB : (Incl. Gen5 Analysis Software), Detection mode: absorbance, Endpoint, kinetic and well area scanning, 6,12, 24, 48, 96-well plates (model ELX800NB also 60, 72, 384-well plates and Terasaki plates), 30 seconds for 96 wells single wavelength, 5 positions filter wheel.	2
26	DIAWASHER II Microplate Washer : Microplate types: flat, round or V-shaped wells, 384 (optional) or 96 well plates or strips, Wash, prime, rinse and aspirate programs, Up to 75 washer programs storable.	1
27	Fluorescence Microscope with Trinocular Head : With camera and accessories, Viewing Head: Trinocular Viewing Head Type: Seidentop Head Rotation: 360° Head Inclination: 30°, Sliding Prism: 70 / 30 Split Interpupillary Adjustment: 55 – 75mm Dioptic Adjustment: -5 to +5, Eyepiece Magnification: 10X Widefield Eyepiece Field Diameter: 18mm Power: 220 / 230V, 50Hz Complete with all standard accessories.	2
28	4 Ft Laboratory Fume Hood Bench Top Model : Overall dimension: 52Wx54Hx 24D inches Appr., Working dimension: 47Wx36Hx 22D inches Appr, External construction: Oven baked epoxy painted MS. Fitted with: Polypropylene working surface and drainage trough. Internal walls made of corrosion & acid resistant DEXERON board. Two electric receptacles to work within the Hood. Inlets for water, gas & Vacuum. Vapor proof fluorescent light. All function control panel for convenient handling. Heat resistant, acid/corrosion proof safety glass sash counterbalanced with corrosion resistant mechanism Powerful stainless steel exhaust blower system capable to generate air velocity 100 f/m (avg) at working surface. 220V, 50Hz. Single Phase	2
29	Ultra Turrax T25basic Homogeniser: For high speed shredding, homogenizing and dispersing a wide range of free-flowing materials. Particle reduction down to 1 µm. Operating range up to 2.5 liters. With Integral variable electronic speed control. Maximum speed 24000 rev/min. Overall 75 x 60 x 250 mm. For 230 V, 50/60 Hz. Single phase suppliers	2
30	Laminar Air Flow (Vertical): With all accessories, Stainless Steel with all around glass, HEPA filters	2
31	Lyophilizer / Freezer Dryer: With vacuum pumps (Shelf area 3.75 sq ft. Shelf temp -45oC - -70oC, 6Lit in 24 hours 8 Lit Total Capacity	1
32	Refrigerated Centrifuge Machine, Temperature Control : With various size rotors	1
33	Thermal Cycler: With DNA equipment	1
34	Ultra-Sonifier: With Ear protection cabin	1
35	Fermenter 6,7 Liters: Sterilizable, acid resistant, Stainless Steel Internal case.	1
36	Ordinary Light Microscopes With all accessories: Olympus with cover boxes and cleansers.	10

37	Surgical Box Stainless steel, Strong Man.: with scalpel blades and all accessories.	10
38	Micro Dispenser (Single Channel) : Biohit (0-10uL) = 2, (10-100uL)=2, (100-1000uL)=2.	6
39	Bp Apparatus Auto/ Manual, Beurer Inc.,: with stethoscope	6
40	Animal Cages, Stainless steel wire cages. : Total 30 in number in one rack.	4
41	Hot Air Oven: Lab, Inner size = 350 350 x 400mm, Drying, High accurate Temperature.	3
42	Incubator : Stainless steel Inner Chamber size 400 x 400 x 500, Volume = 80 liter	3
43	Vortex: Die cast metal, stable housing with noise reducing feet, speed range 600-2700rpm	3
44	Homogenizer: Particle reduction down to 1 μ m. Operating range up to 2.5 liters. With Integral variable electronic speed control. Maximum speed 24000 rev/min. Overall 75 x 60 x 250 mm. For 230 V, 50/60 Hz.	2
45	pH Meter : pH range 2 to 14, resolution 0.01, accuracy ± 0.003 , manual Temperature, comp 32-212°F, epoxy body combination pH electrode, , 4, 7 and 10 pH capsules, swing arm stand, power 9V power supply.	2
46	Water Distillation Apparatus: 4L/hour capacity, size = 500 x 150x 450 mm	2
47	Inverted Microscope with all accessories: Olympus with Camera, Computer and accessories	2
48	Micro Dispenser (Multi Channel): Biohit (100-1000 uL) = 1, (10-100uL)=1	2
49	Elisa Plate Reader: Stat fax, 96 well plate	4
50	Power Lab: With related equipment AD-Instruments, Australia, with all lab Practicals.: Physiology practicals and research.	1
51	Hot Plate With Fume Hood: Satorius, Capacity of 30 flasks, Temperature Range = 100 – 2000°C	1
52	Blood Autoanalyser: with Washing Solutions BD or Siemens, CBC with computer, printer and all accessories for blood culturing and detailed study.	1

F- Equipment for Environmental Sciences Lab

Sr.#	Description with specification	Qty
1	Analytical Balance: Capacity: 210 gram. Readability: 0.1 mg	5
2	ISS perusal piously TDS Meter particle size analyze Cod Digester aeightscale, oven opened closed crush sloe	5
3	Digital Sound Level Meter According to IEC60651 with class 2 accuracy. Portable instruments suitable for measuring industrial and civil noise levels. Range +32 to +130dB x 0.1dB resolution, Accuracy $\pm 1.0\text{dB}$ (± 1 digit). Two response speed modes; slow (1 sec.) and fast (0.125 sec.)	10
4	Water Flow Meter * Dry dial, Magnetic Drive, * Measuring Accuracy Conforming to ISO 4064 CLASS-B, * Interchangeable Spare parts for easy maintenance, * Online replacement of entire Mechanism., * Vacuum sealed register for clear reading in longer run, * High sensitivity, low pressure loss., * Selected High Quality Material for durability	5
5	Digital titrators: 60-100 mL capacity	5
6	Multimeter: A hand-held meter to measure, pH, EC, DO and TDS.	5
7	Sulphur dioxide SO₂ (Ultraviolet Fluorescence method) For SO ₂ in air sample	4
8	Oxides of Nitrogen as NO (Gas Phase Chemiluminescence) For NO in air sample	4
9	Oxides of Nitrogen as NO₂ (Gas Phase Chemiluminescence) For NO ₂ in air sample	4
10	Tropospheric Ozone O₃ (Non dispersive UV absorption method) Ambient Ozone Sensor (EZ-1X)	4
11	Suspended Particulate Matter SPM (High Volume Sampling, Average not less than 1.1m ³ /minute) Suspended Particulate Counter.	4
12	Respirable Particulate Matter PM₁₀ (b Ray Absorption method) For traffic pollution studies.	4
13	Digital CO Meter: Carbon monoxide CO (Non Dispersive Infra Red NDIR method) For CO measurement in air samples	4
14	Portable Airborne Lead & Lead Dust Monitor Lead Pb (AAS method after sampling) For traffic pollution studies.	4
15	Portable CO₂ Meter Carbon Dioxide CO ₂ (Digital CO ₂ Monitor) For ambient air CO ₂	4
16	Digital Sound Level Meter Noise dB (Digital Noise meter) for sound level measurement.	4
17	Ultra Micro Balance Particulate matter weight in μg , 5-21 g	4
18	Distillation Unit: A complete set for water filtration purpose.	4
19	GARMIN GPS ETREX LEGEND HCX: Waterproof, so it can withstand the elements or an accidental dunk in water, Crisp 256-color, sunlight-readable display makes it easy to distinguish map details – plus, it looks fantastic, fast USB computer connection so you can transfer waypoints and other data to your computer. SPECIFICATIONS: Unit dimensions, WxHxD 2.2" x 4.2" x 1.2" (5.6x10.7x3.0cm), Display size WxH: 1.3" x 1.7" (3.3 x 4.3 cm), Display resolution, WxH: 176x 220 pixels, Display resolution: WxH: 176x 220 pixels, Display type: 256 level color TFT, weight: 5.5. oz (156g) with batteries, interface: USB, accepts data cards, micro SD card (not included). Waypoints/favorites/location: 1000, Routes: 50, Track log: 10,000 points, 20 saved tracks.	3
20	Light microscope: along with digital facilities to be used for For warming up samples.	3
21	Centrifugation Machine: Multi-purpose Centrifuges machine of capacity (250 ml) with Temperature Control mechanism.	3
22	Gel electrophoresis tray: A complete tray with accessories for electrophoresis systems.	3
23	PENETROMETER Micrometric Vertical Adjustment. Light-alloy base with leveling screws. Stainless steel calibrated spindle (weight 47.5 g) with friction-free movement. Stop and release button. Dial with 360 divisions corresponding to 0.1 mm penetration steps. Automatic zeroing and relevant micrometric screw. The instrument is secured to a cast light-alloy base and slides on the base's upright. Complete with blocking device and device for the micrometric adjustment of displacements. Suitable for bitumen (needle) and grease (cone). Dimensions: 290 x 270 x 530 (h) mm. Weight: 5.5 kg Accessories supplied as standard: The apparatus is supplied complete with standard penetration needle (for bitumen), 50 and 100 g weights and sample containers: - Diameter 55 x 35 mm (up to 20 mm penetration).	3
24	POCKET PENETROMETER 0 - 4.5 kgf/sq.cm With a special, calibrated, spring, reading is taken directly on the penetration plunger. Measures: 0 - 4.5 kgf/sq.cm Dimensions: 19 mm dia. x 152.4 mm long Weight: 250 g	5



25	Gel Documentation GenoSmart Digital Video System with Integral LCD Monitor: The GenoSmart is a compact imaging system with manual control that is simple to use and is ideal for routine DNA and protein gel documentation.	2
26	Stack/Flue Gas Analyzer For measuring: O2 Oxygen 0 - 21 % CO2 Carbon dioxide 0 - 25 % (calc.), CO Carbon monoxide 0 - 2,000ppm NOx Nitrogen oxide 0 - 1,200ppm, HC Hydro carbon 0 - 100 % LEL SO2 Sulfur dioxide 0 - 4,000ppm, H2S Hydrogen sulfide 0 - 500ppm Temp.: - Gas -20 to 1,200°C	2
27	Eppendorf Micro centrifuges 5430/5430 R 30 place centrifuge(2 or 1 ml) with faster and wider range of application 0.2 -0.5 ml PCR tube adapter Fixed Angle rotor + Lid. Max speed: 13,000-16000 rpm	4
28	Vortex Mixture Speed: 500-2500/Min. Orbital Motion	2
29	Orbital Shaker: Speed: 0-500 rpm, Capacity: 9-12 flasks. Display: LCD, Electronic adjustment of speed and time	2
30	Arc GIS License (For Teaching and for research purpose remote sensing and GIS course to BS and MS students)	1
31	Total Organic Carbon (TOC) Analyzer Analysis method: Catalytic high temperature combustion at 850°-950°C (max. 1200°C) Oxidation from C to CO2 which is quantitatively determined with a NDIR. Optional detection of the formed NO with NDIR, CLD or EC. Measuring parameters: TC, TOC, DOC, NPOC, TIC, POC optional TNb, Norms and standards: ISO 8245, EPA 415.1, European standard acc. to EN 1484, ENV 12260, European Pharmacopoeia 6.0, vol.1 (20244) 2008, p. 71, U.S. Pharmacopoeia-NF, USP 30 (643) 2007; DIN 38409, Safety standards: CE, IEC 1010, EMV	1
32	Atomic Absorption Spectrometer High spectral throughput optics with automatic drift correction; 0.3m Czerny-Turner mount monochromator; automated drive grating with 1200 grooves/mm; Wide range high sensitivity PMT 185 to 900 nm; adjustable bandpass settings 0.2, 0.6, 1.2 nm and reduced height 0.6 nm slit for GF analysis; Up to 1000Hz HCL data sampling rate; Self reversal (Smith-Hieftje) background correction for accurate correction; Power supply available in various AC configurations and safety interlocks. PC, Windows OS, Microsoft Excel & instrument software are required for instrument operation and are sold separately. -Programmable Gas Control -Automatic 6-Lamp Turret -Switchable True Double Beam Optics -D2 Background Correction -Operation Software -Hi Intensity HCL Power Supply -CB 450 Cooling Bath -Universal Autosampler -Flame AA Starter Kit -Autosampler Kit (F/GF/VG) -High Spectral Purity Hollow Cathode Lamps -1000ppm 500ml Standard solution -Nitrous Oxide Burner Head (Allegheeny alloy) -Ventilation Kit -Air Compressor -N2O Gas Regulator with heater -Acetylene (C2H2) Gas Regulator	1
33	Universal Mutation Detailer System: A complete set of apparatus for Mutations detection.	1
34	Autoanalyser-3 HR: Colorimetric determination of NO3, NH4 and total dissolved nitrogen in water, wastewater samples and soil and plant extracts and fertilizer research. Specifications: Two channel fully automated system with autosampler and operating systems; Sampler: Random Access XY-2 Sampler that can hold 180 sample cups; 120 cups 4mL or 5 mL; Pump: Capacity for 28 pump tubes plus up to 8 air supply tubes; Digitally-controlled air injection system is synchronized with pump rollers; Leak detector automatically stops the pump motor; Chemistry module: Two analytical cartridges, Hydraulic components are glass; Hydraulic component internal diameter is 2.0 mm; Heating bath has high accuracy proportional control and user-replaceable coil; Optional dialyzer is available to eliminate interference from coloured samples, such as wastewater, without filtration	1
35	Dionex Ion Chromatograph: Single column ion chromatograph for anion (F, Cl, NO3, SO4, PO4) determination in water, wastewater and soil solutions. System: Fully automated with pump, detector, injection valve, autosampler and peak detection software PeakNet with full packaged; Operating temp: 10-40 °C; Decible level: 53; Gas pressure: 20-100 psi; Detector: 1000 µS; Auto offset: -999 to 999 µS; Display: Liquid crystal display with 16 front panel button; Conductivity cell: Chemically inert polymer, 316 stainless steel electrodes with 1.25 µL active flow and 300 PSI pressure;	1
36	Gas Analyser: For determination of trace gases like CO2, CO, CH4 etc. Measuring technique: Non-dispersive infrared absorption, deflection method, single infrared-source, single-flux (single-beam); Measuring range: O2: 0-500ppm to 0-100%; CO: 0-500ppm to 0-100%; CH4: 0-1000ppm to 0-100%; Ambient temperature: -5 to 45 °C; Linearity: ± 2% FS; Repeatability: ±0.5% FS for the primary range (lower range) ±1% FS for	1

	the secondary range (higher range); Zero drift : $\pm 2\%$ FS/week; Span drift : $\pm 2\%$ FS/week; Response time : (90% response) 15 seconds or less including the time required for substitution of the sample cell	
37	Constant room temperature/Growth rooms : For incubation and simulation studies. Complete with microclimatic control equipments	1
38	Cold room : For storing of soil, water and plant samples; Temperature range: 1-4 °C	1
39	Kjeldahl Distillation Unit : Mains voltage 230 V; Frequency 50/60 Hz; Power consumption 2200 W; Current consumption (230 V) 9.5 A; Dimensions (W x H x D) 360 x 660 x 400 mm; Recovery Rate $\geq 99.5\%$; Reproducibility (RSD) $\leq \pm 1\%$; Detection limit ≥ 0.1 mg nitrogen; Integrated timer : range of 1 second to 99 minutes and 59 seconds; Steam generator : high-performance steam generator switches to stand-by mode when unattended for more than 30 minutes.	1
40	Temperature control water bath Temp. 10-60°C	1
41	Water De-ionizer : 4 stage filtration , Shock proof and corrosion resistant. Work on normal Voltage (220-230 V)	1
42	Stereo Microscope : Zoom range. 10X eyepiece Magnification with supplementary lenses Free working distance	2
43	Nanodrop Spectrophotometer : For the quantification of DNA, RNA and protein molecules. Cuvettes Free spectrum, Loading capacity 1-5 sample, Concentration limit determination ranged from 5-3000 ng μ L ⁻¹	1
44	Portable Total Suspended Solids (TSS) Meter : to determine TSS and turbidity of water and wastewater.	3
45	Chemical Oxygen Demand (COD) Meter : to determine Chemical oxygen demand (COD) for water and wastewater samples.	1
46	Biological Oxygen Demand (BOD) Meter : to determine Biological oxygen demand (BOD) of water and wastewater samples.	1



G- Equipment for Food Sciences Lab

Sr. #	Equipments with specifications	Qty
1	Fully Automatic Hematology Analyzer 23 parameters, with 3 part WBC differential 10 uL sampler volume Memory of 30,000 results including histograms Throughput: 35 samples/hour, Automatic and manual calibration, Automatic dilution when power on/off High voltage cleaning after each measurement, QC mode: X-B, L-J curve, SD, CV Automatic Temp.	1
2	Analytical Balance Type: Digital Microprocessor Controlled Capacity: 410 g. Readability: 1mg (0.001g). Tare range: 410 gm. Repeatability: < + 1 mg Linearity: < + 2 mg Response time: 3 Second. Pan size (dia): 120 mm Calibration: Internal. Display: LCD	1
3	Digital Brix Refractometer Range: 0 to 50% Brix / 0 to 80°C (32 to 176°F), Resolution: $\pm 0.1\%$ Brix / $\pm 0.1^\circ\text{C}$ ($\pm 0.1^\circ\text{F}$) Accuracy: $\pm 0.2\%$ Brix / $\pm 0.3^\circ\text{C}$ ($\pm 0.5^\circ\text{F}$) Automatic Temperature Compensation between 10 and 40°C (50 - 104°F) Measurement Time Approximately: 1.5 seconds, Minimum Sample Volume: 2 metric drops Light Source: Yellow LED, Sample Cell: Stainless steel ring and flint glass prism Case Material: ABS, Enclosure Rating: IP65 Battery Type / Life: (1) 9V / 5000 readings	1
4	Laboratory centrifuge 23 parameters, with 3 part WBC differential, 10 uL sampler volume Memory of 30,000 results including histograms, Throughput: 35 samples/hour Automatic and manual calibration, Automatic dilution when power on/off High voltage cleaning after each measurement, QC mode: X-B, L-J curve, SD, CV Automatic Temp.	2
5	Colony Counter (BioCounter Automatic colony counter) CCD camera: Professional Colour digital CCD, 1.4 million Lens: 8mm high resolution, Illumination: Long-life upper incident and bottom transmitted LED arrays, with dark field and bright field (selectable suspended LED arrays) Petri dish diameter: Standard 50mm~110mm, Testing method: Fully automatic with manual option, Counting time: Over 300 colonies per sec, Measurement time: Over 1 plate per sec	1
6	Micro quant Power 100-240 VAC 50/60 Hz, Dimensions, Weight, Gen5 software	1
7	Laminar Cabinet Flow Air Velocity: Between 0.4 to 0.5 m/s with +/- 20%, HEPA Efficiency: 99.997 % at 0.3 microns with DOP test, Sound Level: Less than 65 dB (A), Light Intensity (Lux) :900 - 1300 Lux Cleanliness: US Federal Standard 209 E, Class 100, Power Supply: 220/240 V Single Ph, 50 Hz	1
8	Lacto scope compact sample volume: typical 10 ml, Sample temperature: 2°C to 50°C, System dimensions (HWD): 45 cm x 85 cm x 50 cm, Weight: 86 kg, Power supply: 110 V to 230 V, 50 Hz to 60 Hz, 650 VA	1
9	Hand Refractometer Measuring range: 0-100 Brix equivalent or <1.333 to >1.5400 refractive index	5
10	pH Meter pH range: -2.000 to 16.000pH, pH accuracy: $\pm 0.002\text{pH}$ Resolution: 0.001pH, Ion concentration range: 0 to 19,999ppm Ion concentration accuracy: $\pm 0.5\%$, Resolution: 1ppm mV range: 0 to $\pm 1,999.9\text{mV}$, m accuracy: $\pm 0.2\text{mV}$	5
11	Cheese Vat 0-100 Brix equivalent or <1.333 to >1.5400 refractive index	1
12	Automatic Isothermal Calorimeter with Oxygen Combustion Bomb, Oxygen Regulator, Nitrogen Regulator, Rinse Tank, 500 Firings Kit, Printer and Ribbon Oxygen Fill: Automatic, Bucket Fill: Automatic, Balance Communication: RS232C Port Printer Communication: RS232C Port, Power Requirement: 230V, 50 Hz.	1
13	Water Purification System Millipore Resistivity, $\text{M}\Omega\cdot\text{cm}$ @ 25°C > 5, TOC, ppb ($\mu\text{g/l}$) < 30, Bacteria, cfu/ml < 0.1 Particulates > 0.22 μm , Particulates/ml < 1	1
14	Unit Gel Electrophoresis Midi Horizontal 12.8 x 15cm kuroGEL Midi 13 with removable casting tray, 2x1mm thick 16-sample combs Coloured loading strips	1
15	Rotary Evaporator Condenser type/area(m2): Ascending condenser/0.6m2, Drive: Brushless motor AC200V 90W Rotation speed (rpm): 0-120rpm(variable speed), Rotation flask: 20L. Receiving flask: 10L.	1



16	Low Temperature Freezer Microprocessor control and digital display of temperature, adjustable temperature control -10°C--86°C, Ergonomic design, Large LCD digital display (cabinet temperature, set temperature, ambient temperature voltage, etc) , Multilevel shelves for ease accesses (upright appliance) Safety lock to prevent accidental access, Test port for laboratory tests	2															
17	Grinding Mill	1															
18	Digital Weighing Balance Test density of solid or liquid, overload protection, 7 units conversion, under weighing hook	5															
19	Small Scale Dehydrator for Fruits and Vegetables Power: 0.75kw/380v, Diameter of the roller: 500mm , Overall dimension: 800x500x730mm Capacity: 300-400kg/h, Weight: 220kg	1															
20	Fruit Grader Speed capacity: 2400-2600 fruit/ hour power :1.87Kw size :1.10m* B2m *H1m weight :1000kg	1															
21	Ice Cream maker Clear Viewing Lid with Pouring Hole, Ice Cream Scoop Included, Simple Operation, Non-Slip Feet Make:Sunbeam	1															
22	Visco Meter Capacity: 2000 Typical value, dependent on sample type and temperature	2															
23	Amylogram/ Amylograph	1															
24	Mixogram	1															
25	Farinogram/ Farinograph	1															
26	Fruit Sorter	1															
27	FPLC (Fast Protein Liquid Chromatography)	1															
28	Baking Line, For the optimization of different prameters to produce high quality bakery products. The line will also be very effective for research and development purpose.	1															
29	Digital Burette Volume : 0-50 ml , Increment : 0.01 ml , Inaccuracy: 0.2 % , Imprecision: 0.1 %	1															
30	Blood Shaker with accessories	1															
31	Digital Stadiometer with accessories	1															
32	Digital Body Composition Scale with accessories	2															
33	G. C. Hb. Meters with accessories	1															
34	Digital Peak Flow Meters with accessories	1															
35	Digital Oxymeters with accessories	1															
36	Pulse Rate Meter digital with accessories	2															
37	Micropipettes with accessories <table border="1"> <thead> <tr> <th>Volume Range</th><th>Increments</th><th>Inaccuracy</th></tr> <tr> <th>[μl]</th><th>[μl]</th><th>($\pm$) %</th></tr> </thead> <tbody> <tr> <td>0.5-10</td><td>0.1</td><td>2.5</td></tr> <tr> <td>10-100</td><td>0.5</td><td>3</td></tr> <tr> <td>100-1000</td><td>5</td><td>2</td></tr> </tbody> </table>	Volume Range	Increments	Inaccuracy	[μ l]	[μ l]	($\pm$) %	0.5-10	0.1	2.5	10-100	0.5	3	100-1000	5	2	1
Volume Range	Increments	Inaccuracy															
[μ l]	[μ l]	($\pm$) %															
0.5-10	0.1	2.5															
10-100	0.5	3															
100-1000	5	2															
38	Multichannel Micropipettes Soft force / leak free tip loading and ejection. Easily removable & fully autoclavable manifold. Easy Right or left hand operation because of 360° rotatable Manifold. One hand tip ejection. Attractive color coding. Compatible with most types of tips.	2															
39	Ultra Temperature Controlled Freezer (-80 C), Model DW-86L490 Net/Gross Weight (kg) 295/335 Shelves/Inner Door 3/4 Exterior Dimensions (W*D*H) (mm) 860*900*1970 Interior Dimensions (W*D*H) (mm) 590*630*1310 Packing Dimensions (W*D*H) (mm) 902*1004*2130 Container Load (Sets) 20/40/40/H 12/24/24	1															
40	Positive Displacement Micropipettes Range from 1 μ L to 1000 μ L.	1															
41	Vacuum Sealer Digital	1															
42	Nitrogen Evaporator	1															
43	Texture Analyzer	1															
44	Fluorescence Detector Lamp: Vertically mounted, CW, 150 W Ozone-free xenon arc lamp Gratings: 1200 groove/mm blazed at 330 nm (excitation) and 500 nm (emission), plane ruled Automatic self-calibration of all wavelength drives and slits	1															



	Monochromators: All reflective optics, Czerny-Turner spectrometers Detectors: Emission: R928P photon counting PMT (185-850 nm) and reference photodiode for monitoring lamp output Water Raman S/N: 6,000:1 (RMS method) See Signal-to-noise ratio Slits: Continuously variable from 0 to 30 nm, Accuracy: 0.5 nm, Repeatability: 0.1 nm Minimum step: 0.0525 nm, Integration time: 0.001 to 160 sec Software: Fluorescence Spectral Correction Factors: Included	
45	Ultrasound Assisted Extraction with accessories Sonication tank Transducer Refrigerated water circulation	1
46	Lyophilizer with all accessories Ice capacity per 24 hours (L): 2 liter / 24 hours, Total ice capacity (L): 3 liter Condenser temperature (°C): < - 55 °C, Compressor (HP): 1/3 HP 2 x 1/3 HP Cabinet dimensions (W x D x H): 800 x 650 x 400 mm, Weight (Kg): 68 Kg Electrical: 230 V / 50 Hz 230 V / 50 Hz, Microprocessor control: Yes Hot gas defrosting: Yes, Temperature display: Yes (°C), Vacuum display: Yes (mTorr) Autoturn programming: Yes, Including oil rotary vacuum pump 100 l/minute + oil mist filter	1
47	Pilot Plant for Fruit Dehydration	1
48	UHT Milk Production Unit	1
49	Pilot Plant for Juice Concentrates,	1
50	Pasteurization and Cooling Tanks Stainless steel tanks with capacity of 10 to 100 Liters	1
51	Spray Dryer Feed in (Kg/hr):33, Evaporation (Kg):16, Powder Rate (Kg):17 Power (kw):7.7, Cyclones: 1, Length (m): 2.3 Width (m): 2.5, Plant Height (m): 4.41	1
52	High Pressure Homogenizer	1
53	UV Spectrophotometer Cary 4000 UV-Vis Spectrophotometer, Agilent Technologies • Optical System: Double Beam, • Wavelength Range: 175 to 900 nm • Resolution: Inquire, • Light Source: Mercury lamp Enzyme production, iron determination in flour,	1
54	Kjeltec Protein Estimation Unit, Kjeltec 8400	1
55	Soxhlet Extraction Unit (6 Units), Temperature Range: 50°C to 350°C Temperature Control : Temperature is controlled through electronic solid state temperature controller cum indicator or micro processor based digital temperature controller cum indicator or hydraulic thermostat with energy regulators. Temperature Sensitivity: The temperature is controlled with an efficiency of + 2% (Set Value). Power Requirement: Power 2 KW, Single Phase, 230 Volts. Standard Model: Unit of 6 test Heater Type (with or without glass parts & clamps)	1
56	Blanching and Washing unit, Brand Name: Sanshon Model Number: VPT Type: Blancher material: SUS304, PPT spray type blanching machine Capacity: 0.5-1.2t/h, power: 1.85kw, steam consumption: 0.5-1.0t/h water consumption: 1.5-2.5t/h, sterilizing time: 10-100min(frequency conversion speed adjustment) dimensions: 12150x1200x1650mm (excluding drying section)	1
57	Semi-Automatic Food Packaging Machine	1
58	Laboratory Muffle Furnace Digital controller, max temperature: 1904°F (1040°C), chamber and O.D. dimensions (HxWxD): 5x4-1/4x6" (127x108x152mm); 10x14-1/2x11" O.D. (254x368x279mm O.D.)	2
59	Digital Flame Photometer Range: Na: 0-100ppm, K: 0-100ppm, Ca: 15-100ppm (Optional), Li: 10-100ppm(Optional) Sensitivity: Sodium (Na): 5ppm, Potassium (K): 5ppm, Calcium (Ca): 10ppm (Optional), Lithium (Li): 10-100ppm(Optional), Readout: 2½ digit bright red LED display Accuracy: ±2% up to 40 ppm, Ignition: system with external igniter, Dimensions: (WxHxD)mm 355x245x230 (Approx.), Weight (approx.): 7.5 kg, Repeatability: ± 2 counts	1
60	Water Deionization Unit Resistivity (M-cm): >18, TOC (ppb): <10, Bacteria (CFU/ml): <10	1

61	Bread and Pizza Proofer. Place of Origin: Shanghai China (Mainland) Brand Name: cnix Model Number: yxz-64 Type: Grain Processing Equipment material: stainless steel Humidity 60%-90%, Temperature 30-38°C Specification: 32 trays, Material: stainless steel	1
62	Fruit and Vegetable Cutting Tables WxLxH 4x10x3.5 Material: stainless steel	4
63	Hot Air Oven, Acm-22066-I Humidity Range: From Ambient to 90% Humidity Sensitivity: Humidity controlled with an accuracy of + 7%, Temperature Range 5°C - 250°C., Standard Sizes : • Inner Chamber (W x D x H) • 300x300x300 mm	3



H- Equipment for Bioinformatics & Biotechnology Lab

Sr. #	Equipment name & specification	Qty
1	Real Time PCR Specification: Thermal cycling system Peltier-based, 96-well block Sample Ramp Rate +/-1.1°C/sec Peak Block Ramp Rate 1.6°C/sec Temperature Range 4°C – 100°C Temperature Accuracy ±0.25°C of set point/display temperature measured at 3 minutes after clock start Temperature Uniformity ±0.50°C, 30 seconds after clock start Optical system Single excitation, four emission filters, and CCD camera Calibrated Dyes at Installation SYBR® Green I, FAMTM, VIC®, JOETM, NEDTM, TAMRATM, ROXTM Passive Reference Dyes ROXTM or any calibrated dye. Data Collection Data collected in all 4 filters for all wells regardless of plate setup. Plate setup may be altered after run completes. Quantitative PCR run time < 1 hour 50 minutes Supported Volumes 20 – 100 µL Supported Consumables • Standard optical 96-well plates • 8-strip 0.2mL tubes • 0.2mL tubes • Optical adhesive covers • Optical flat caps	1
2	Nano-drop Spectrophotometer Specification Instrument Type Spectrophotometer Minimum Sample Size 0.5 µl Sample Number 1 Path Length 1 mm (auto-ranging to 0.05 mm) Light Source(s) Xenon flash lamp Detector Type 2048 - element linear silicon CCD array Wavelength Range 190 - 840 nm Wavelength Accuracy 1 nm Spectral Resolution ≤ 1.8 nm (FWHM at Hg 253.7 nm) Absorbance Range 0.04 - 300 (10 mm equivalent) Detection Limit 2 ng/µl (dsDNA) Maximum Concentration 15,000 ng/µl (dsDNA) Measurement Time < 5 seconds Software Compatibility Professional versions of Windows 7 (32 bit and 64 bit), Windows Vista XP (32 bit)	1
3	Ice Machine Specification : Producing ice flakes, Storage capacity range 60-100 Litres	2
4	ELISA Reader Detection mode Absorbance Microplate types 96-well plates Temperature control 4-Zone temperature control to 50°C (ELx808IU) Shaking Low, medium, high and variable speeds Software Programmable software Wavelength range 380 to 900 nm Bandpass 10 nm typical Dynamic range 0 to 4.0 OD Resolution 0.001 OD	1



	Filter wheel capacity 6 positions Filters supplied Default filters supplied are: 405, 450, 490 and 630 nm (340 nm also included with UV model).	
5	Mini Protean Tetra Cell Gel electrophoresis apparatus, 0.75 mm gel thickness, includes companion module, 2 casting stands, 4 casting frames, 10-well combs, 5 sets of glass plates, along with Power supply	1
6	Temperature Controlled centrifuge machine Specification: Temperature control range -10°C ... +25°C Stable temperature maintenance range 25°C below ambient ... to +25°C Temperature setting resolution 1°C Speed regulation range for centrifuge tubes 100-6000 rpm Speed setting resolution 100 rpm Tubes, 50mL tubes, 15mL tubes, and 1.5mL tubes, along with changeable rotors	1
7	Dry bath incubator Specification Temperature and time can be set Self-detection and alarm Buzzer alarm when temperature control ends Calibrating temperature discrepancy Easy replacement, cleaning and disinfecting of metal blocks Built-in over-temperature protection Temp. range: room temp. +5-150°C Temp. control discrepancy: $\pm 0.1^\circ\text{C}$	1
8	Mini tank Electro-blotter along with accessories Compatible with Mini Protean Gel Electrophoresis system, or 9 x 9 in. gel size Transfer Area: 9 x 9cm; Buffer volume: 1.4L; L x W x H: 18 x 13 x 16.5cm	1
9	Plant growth Chamber (Programmable) Temperature Range -2°C to +50°C lights off; +5°C to +40°C lights on Control Fluctuation $\pm 0.3^\circ\text{C}$ Humidity (Optional) 60% - 100% RH - temperature dependent Low energy ultrasonic humidity generator & capacitive humidity sensor Shelving & Lighting Configuration: Adjustable shelves, 2-6, High intensity should be fully programmable, Safety User settable hi/low temperature alarms with remote contact Audible & visual alarm indicators, Interior Corrosion resistant stainless steel, Exterior Painted, protected steel with a textured finish. Service Requirements 230V, 60Hz, 13 amp max. Water Requirements De-mineralised water (humidity option only) Capacity 75 ft ³ (three doors/sections)	1
10	Freezer Temperature range; with separate cabinets, -70 to -80°C	1
11	CO₂ incubator Chamber Material stainless-steel interior with coved corners CO ₂ Concentration Range 0 to 20%, Controlled Temperature Range: 5° to 60°C, Capacity 40L Shelf Material Stainless-steel, Adjustable Humidity%, (50-80%)	1
12	Binocular Lab Microscope (Inverted) with digital CCD Camera Specifications Full-Kohler stand Halogen illumination with 6V, 30W halogen lamp 4 position nose piece Mechanical stage 75x30 with specimen holder clip Binocular phototube Eyepieces 10x/20 Br. Foc. Objectives plane Achromatic 4x, 10x, 40x, Ph2 and 100x (Oil) Condenser 0.9/1.25 and Ph2 phase contrast slider External power unit 220-240 AC/50-60Hz/30VA with specific adapters Dust cover Oiler with 5 ml immersion oil Color filter set (blue, green, yellow)	1

	Digital camera attachment consisting of: CCD camera, software, hardware and adapters 22" LED monitor Accessory and tool kit and manuals	
13	PCR machine, 96 wells, 0.2mL tubes Gradient thermal cycler, auto-restart in case of power disconnection	1
14	Laminar flow clean bench Width , 1.5 meter, Load Bearing Capacity 30kg Lighting > 1000 lx, Power Ports 3, Air Velocity Level I: 0.15 - 0.25;	4
15	Tube incubator Temperature range; adjustable, up to 65 °C (1.5ml)	3
16	Analytical balance Capacity, up to 300 grams Readability @ 0.1 mg	3
17	Pipette-man (complete sets) Fully autoclavable, High quality precision and accuracy, One set includes 6 pipettes (0.5-2.5 uL, 1-10uL, 2-20uL, 20-200uL, 100-1000uL, 1000-5000uL)	3
18	Electrical balance Weighing Capacity: 3.2 Kg Minimum sample weight: 1 g Readability: 1mg	3
19	Gel documentation System Camera resolution > 3 MP UV trans-illuminator, Windows Compatible software, along with attached computer, Built in UV protection screen, along with UV protection Goggles	1
20	Incubator Size: 10-15 Cubic feet Temperature range: 10 °C-65°C Programmable, with multi-shelves	3
21	Magnetic stirrer Heating power: 180 watts Maximum heating plate temperature: 250°C (480°F) Stirrer motor power: 10 watts Stirring speed: 0-1400 rpm Stirring capacity: 500 ml liquid volume maximum Maximum continuous use: 8 hours on high heat, 8 hours on half-speed stirring , 4 hours on full speed stirring Heating plate dimensions: 118 mm x 118 mm (4.6" x 4.6") Heating plate material: anodized aluminum Overall base dimensions (LxWxH): 200 mm x 120 mm x 90 mm Height with support stand: about 350 mm (14") On/off power switch Heating power variable control with LED indicator Magnetic stirrer variable control with LED indicator 110 volt, 60 hertz power input	3
22	pH meter Multifunctional pH meter for water analysis Which measure pH, Temperature, Electrical Conductivity (EC), Conductivity Factor (CF), Total Dissolved Salts (TDS) and millivolts (mV). Measuring Range EC: 0.00 to 19.99 mS/cm CF: 0.0 to 199.9 TDS: 10 to 19990 ppm pH: 0.00 to 14.00 mV: 0 to ±1999 Temperature: -50 to 70°C (-58 to 158°F)	3
23	Air conditioner (1.5 ton) Wall mounted split air conditioners Capacity 18000 BTU	6

24	Freezers (-20°C) Cabinet Type Corrosion-resistant, spark-proof Includes 2 shelves, 3 baskets Integrated controller Digital display High- and low-temperature alarms Standard door locks Low energy consumption Access ports Temperature Range (Metric) -10° to -26°C Voltage 230V Width (Metric) Exterior 59.5cm Width (Metric) Interior 44cm	3
25	Temperature controlled shaker incubator Precise shaking incubator, with illuminators, Temp. range: 10°C - 60°C, refrigerated, orbital motion, w. digital fuzzy control & LCD back light system, timer: 99 hr. / 59 min., int: dimension 750 x 720 x 400 mm, external dimension: 1065 x 900 x 980 mm, heater: 1200 W, power supply: 230 V, 50/60 Hz Minimum Noise and No Vibration Advanced Shaking Mechanism Provides Quiet Shaking and Precise Speed Control Automatic Stop of Shaking, Heating and Refrigeration when a Door opens Universal Spring Rack for Various Shapes/Sizes of Flasks (Optional) Interface for Monitoring and Controlling with PC	3
26	Vortex Overall dimensions (L x W x H): 8 x 4.25 x 5" (20.3 x 10.8 x 12.7cm) Electrical (50/60 Hz): 120V, 1.2 amps, 150 watts Fuses: 5mm x 20mm, 5 amp quick acting Speed range on mode: 500 to 3000rpm auto mode: 1000 to 3000rpm pulse mode: 3000rpm Timer: 1 second to 9999 minutes Orbit, Digital unit: 0.194" (4.9mm) Pulsing unit: 0.098" (2.5mm)	3
27	Water bath Interior dimensions (W x D x H): 450 x 300 x 160 mm Volume of bath interior: approx. 20 liters Working height (incl. lid): 190 mm Max. water level above shaking cage / tray: 105 mm / 90 mm Shaking frequency: from 10 - 250 rpm Over-temperature cut-out: electronic, 4 °C above set temperature, and electro-mechanical > 130 °C Housing: corrosion-resistant, made of electrolytically galvanised sheet steel, powder-coated Electrical connection: 230 V / 50...60 Hz / 1.5 kW	3
28	Autoclave machine (varying capacity) Chamber dimensions (diameter x depth) ø370 x 415 (mm) / ø14.6 x 16.3 (inch) Effective chamber height including recess in lid 463mm (18.2inch) Effective capacity 50 liters (1.8 cu.ft.) Maximum pressure 0.240MPa [34.8psi] Sterilization temperature 115°C to 135°C Sterilization timer 1 minute to 300 minutes	2
29	Glassware drying cabinet Capacity: 113 litre (4 cu ft). Internal dimensions (W x D x H): 430 x 750 x 340 mm External dimensions (W x D x H): 530 x 760 x 360 mm Max. Temp. 50 °C	1
30	Liquid nitrogen storage tank (100L) High-strength aluminum alloy structure, light empty weight	1

	Hinged handle and portable lockable device installed to the container lid vacuum quality guarantee is ensured with the multi-layer thermal isolation design Capacity 100 liters, Along with two (02) liquid nitrogen carrying flasks of 1.5 liter capacity	
31	Water double distillery Specification: Output = 4 Liter per hours, double distilled, Water supply: from any raw source, tap water, almost 1 L/min, Power supply: single phase, not greater than 2000 Watts	1
32	Compound Microscope Specifications Plan Achromat 4x, 10x, 40xs, 100xs oil objectives. 10x eyepieces Total Magnification: 40x, 100, 400xr, 1000xr oil immersion. Condenser: NA 1.25 Specimen Stage: Rectangular mechanical stage, 140mm x 135mm and vernier scale readability to 0.1mm. Focusing: Fine and coarse coaxial focusing Illumination: 6V / 30W halogen lamp or LED illumination. Both have intensity control for optimal brightness. Universal sensing power supply 100-240V. 45mm blue filter, vinyl dust cover and owner's manual.	4
33	Microwave Oven Computerized touch control Digital display Memory check Ac line voltage single phase, 120v, 60 hz, ac only Receptacle required 15 amp., nema 5-15r Ac power required 1.6 kw, 14.0 a Output power 1000 watts (iec-705 test procedure) Frequency 2450 mhz Outside dimensions (whd) 20 1/2" x 12 1/8" x 16" Cavity dimensions (whd) 13 7/8" x 8 1/8" x 14 5/8" Cavity stainless steel Stainless steel interior and door	3
34	Minispin Centrifuge 24 wells centrifuge 1.5-2 ml tubes rotor Max. speed 14000 rpm Max. time 1 sec- 999 min.	3

I- Equipment for Central Hi-Tech Lab

Sr #	Description and Specification	Qty
1	Spectrophotometer double beam with printer & other accessories Optical Design: Double-beam Wavelength Range: 190 –1100 nm Wavelength Accuracy: ± 0.8 nm (full range 190 to 1100 nm) ± 0.5 nm (546.11 nm mercury line), Wavelength Repeatability: ≤ 0.1 nm (546.11 nm mercury line, SD of 10 measurements), Light Source: Xenon flash lamp Detector: dual silicon photodiode, Spectral Bandwidth: 1 nm; 2 nm; Data Intervals: 10, 5, 2, 1.0, 0.5, 0.2, 0.1 nm Resolution: > 1.6 (peak-to-valley ratio; toluene in hexane) Scanning Speed: < 1 to 6000 nm/min; variable Scan Ordinate Modes: Absorbance, % Transmittance, % Reflectance, Kubelka-Munk, log (1/R), log (Abs), Abs*Factor, Intensity, Made: USA, Japan, Germany and western Europe Accessories: 1. 10MM Quartz Cell 4pair No.4 2.Xenon Lamp No.2 3.Computer with software programming /laser printer or Equivalent.	2
2	HPLC (Gradient System) Pump type: Binary Flow range: 0.1–10 mL/min (0.001–10 mL/min), Flow accuracy: $\pm 0.1\%$ Flow precision: $< 0.05\%$ RSD or < 0.01 min., Pressure range: 2–62 MPa (9000 psi) Pulsation: < 0.2 MPa or $< 1\%$, Manual Injector: Injection Volume: 0.1 μ L to 1 mL Max. Pressure: 48 MPa (7000 psi), pH Range: 0–10 Max. Temperature: 80 °C, Flow Passage Diameters: 0.3 mm (0.013 in.) Auto Sampler: (Optional), Injection methods: In-line split-loop (flow-through) injections Injection volume range: 0.01–100 μ L (1–100 μ L) Injection cycle time: < 15 s for 5 μ L, Sample temperature accuracy: ± 2 °C Sample thermostating: 4–45 °C or 22 °C below ambient Column Compartment, Temperature Ranges: 5°C to 110°C	1
3	Atomic Absorption Spectrometer. Optics Double beam Monochromator Echelle type Photomultiplier Wide range (180 nm to 900 nm) Flame Atomiser Universal system (uses 50mm Finned Ti burner) Furnace Atomiser, Furnace Vision System As standard Background Correction Guaranteed Quadline deuterium and AC Zeeman systems Gas Management Automatic binary control	2
4	FTIR Spectrometer Wave length: 4000 cm ⁻¹ – 400 cm ⁻¹ , Source: Mid-infrared Laser Type: HeNe laser tube, Modulator: KBR Modulator Compartment Window: KBR Window, Beamsplitter: KBr/Ge mid infrared Beamsplitter Range: 7800–350 cm ⁻¹ , Detector: DTGS Detector Range: 7800–350 cm ⁻¹ , Signal-to-noise: 35000:1 peak to peak in one minute Wavelength precision: better than 0.01 cm ⁻¹ at 2000 cm ⁻¹ Spectral resolution: better than 0.4 cm ⁻¹ , Ordinate linearity (ASTM E1421): $< 0.1\%$ T deviation from 0.0% T, measured at 4 cm ⁻¹ resolution, Software Suite: compatible Windows® XP and Windows Vista®, Computer: Compatible with software with Laser printer, Library: Pharmaceutical library . Power: 220 V, 60 Hz Accessories : Smart ATR accessory with diamond IATR crystal, Transmission accessory & Liquid cells (No.5).	2
5	Inductive Couple Plasma (ICP) Spectrometer : Echelle type 52.91 grooves/mm ruled grating 383 mm effective focal length 9.5 o UV fused silica cross dispersion prism Wavelength range: 166 – 847 nm Spectral bandpass: 7pm at 200 nm Detector : High performance CID86 chip RF source : 27.12 MHz solid state 750 – 1600 watts output power (Duo restricted to 1350 watts) Sample pump : 4-channel, 12 roller peristaltic, Speed 0 – 125 rpm Plasma gas : Mass flow control, 0 – 20 L/min argon Nebulizer gas : Mass flow control, from 0 – 1.5 L/min Auxiliary gas : Mass flow control, from 0 – 2 L/min Standard sampling kit : Concentric glass nebulizer Glass cyclone spray chamber Semi-demountable torch 1.5 mm bore quartz injector (radial version) 2 mm bore quartz injector (Duo version).	1



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6	Electric Muffle Furnace 1600C Volume (litres): 21.7 , Maximum temperature: 1600°C Maximum Continuous Working Temperature: 1200°C-1250°C Temperature Sensor: Type 'R', Max Power Rating (kw): 7.0 Holding Power (kw): 2.8 , Nett Weight (kg): 120 Electrical Supply: 1 PH , Power Control: Solid State Relay	1
7	Electric balance 0.01mg 1. Rapid response , 2. Multiple weighting units 3. Automatic internal calibration , 4. Large LCD display , 5. Large SS pan , 6. Capacity: 600gm 7. Readability: 0.01g , 8. Power: 220V , MADE : Japan /USA /Western Europe	2
8	ULTRA Centrifuge Machine: Controlled: Microprocessor Complete with angle head of 8 tubes or places 8x15 MI Maximum speed: 80,000rpm, RCF: 6,15,000, Fixed angle rotor: 12mlx8, 160mlx6 Swing bucket rotor 60,000 RPM/ 4,19,000 RCF 5mlx3, Tachometer : built-in to show live speed Fitted with lid locking device, Emergency lid lock released , Motor over heat protection Transparent lid , speed rpm: input in increments of 100, Power : 220 Additional tubes are required for each unit , MADE : Japan /USA /Western Europe	2
9	Rheometer: Advanced controlled stress, direct strain and controlled rate rheometer comes standard with wide torque range [0.0001 to 200mN.m], ultra-high resolution [0.04micro rad], high angular velocity [300rad/s], and high stability normal force transducer [0.01 to 50N].	1
10	Diffractionmeter, Dual Wavelength System, 50Hz: PC Windows, with High Sensitivity 16 Megapixel CCD Detector, Four-Axis Kappa Goniostat, Co-mounted sealed tube sources, Charge-Coupled Device Area Detector System for single crystal frame data collection and imaging.	1
11	APEX II 16 Megapixel CCD Detector: Single-module 62 mm 4k x 4k CCD area detector with high counting efficiency, low noise and large capacity, with integrated cooling system, gain of 170 electrons per Mo X-ray photon / 85 electrons per Cu X-ray photon , user selectable 512 x 512 or 1024 x 1024 pixel frame readout mode, four port readout, 62 mm x 62 mm active detection area, no demagnification (ratio 1:1), 15 µm on-chip pixel resolution, highly effective, high resolution phosphor optimized for Molybdenum and copper wavelengths (or other; on request), mount for Kappa DX 2track,	1
12	Kappa 4-Axis Goniometer: Full four axis instrument for flexible sample orientation and complete data collection to high theta values at very small crystal-to-detector distance, Computer controlled and motor driven detector DX motion, Collision protected in hardware and in software, Completely integrated with supplied data collection strategy software, High speed shutter for accurate exposure time control, Five Computer-controlled Motions: DX (sample to detector distance), kappa axis, 2 theta axis, Omega axis, phi axis: $n \times 360^\circ$ positioning accuracy: 2 theta, Omega, Kappa: 0.01°, Phi: 0.015°, resolution 0.0003°, Reproducibility: better than 0.005°, Sphere of intersection of axes: less than 7 microns, Incident beam conditioner, including 3 collimators, Beam diameter as crystal position 0.25, 0.35, 0.6, X-ray tube shield mounted on alignment slides, with shutter	1
13	Elemental Analyzer vario MICRO cube for simultaneous CHNS Analysis with options for O and Cl analysis: Most inorganic solids and liquids (capsule sealing press or automated liquid sample feeder as accessory). Optimized for the measurement of samples in the weighing range of 0.03 mg up to approx. 10 mg organic substance, but also applicable e.g. for 300 mg soil. • Automatic sample carousel for 120 samples, in single and permanent operation; reloadable at any time during operation (80 position carousel for larger samples optional). • Blank free sample injection by means of the ball-valve with He-purging based on a Heraeus patent. Time controlled combustion in pure oxygen with a permanent temperature of max. 1200°C. This high furnace temperature is a prerequisite for 100% recovery in S- and O analysis.	1
14	SDT Simultaneous DSC-TGA: Provides a true simultaneous measurement of heat flow (DSC) and weight change (TGA) on the same sample from ambient to 1,500 deg. C. DSC noise is <4 microwatts and the TGA balance sensitivity is 0.1 microgram. A heat flux DSC design with separate sample and reference pans is used, and is calibrated for heat flow measurements using sapphire. The features automated furnace movement and a horizontal purge gas system with digital mass flow controllers and programmable gas switching capability. A separate Inconel 600 tube permits introduction of reactive gases into the sample chamber. The design allows evolved gas studies using FTIR or MS. The can be used in the DTA-TGA mode, and also in the dual sample mode, where separate TGA and DTA signals are available from two samples run simultaneously	1



15	Dynamic Mechanical Analyzer: A research quality DMA that provides viscoelastic measurements on materials from 1000 Pa to 1000 GPa. The temperature and frequency range of operation are (-150 to 600 deg C) and (0.01 to 200 Hz) respectively. The force range is 0.0001 to 18 Newtons. The amplitude range is 0.5 to 10,000 microns with resolution to 1 nanometer over entire the 25mm of drive shaft travel using a linear optical encoder. The provides ultra sensitive force measurements down to 0.0001 Newtons, which is ideal for films, fibers and other materials with low stiffness. The module is designed with a full VGA touch control color screen, automated furnace movement, and easy clamping accessibility. The accessory kit includes a 35mm dual cantilever bending fixture, digital calipers, steel standards and a torque meter. Time Temperature Superposition software is supplied	1
16	Fully Automatic Amino Acid Analyzer, auto-sampler with 4x48 Standard vials or 4 micro plates, with inert gas supply New Accelerated Method for the analysis of up to 48 amino acids and derivatives in Physiological fluids (including the analysis of Allosoleucine) in less than 90min to Arginine, Food and Feedstuff, Peptides Synthesis and Pharmaceuticals: Quick analysis of up to 24 amino acids in Protein Hydrolysates and Oxidized Protein Hydrolysates in less than 45min to Arginine (Accelerated Protein Buffer System) with no matrix interference and near baseline separation for all the compounds. Detection Limit Ninhydrin - 9 picomoles S/N=3 Reproducibility Area: Better than 0.5%RSD at 10 nanomoles. Retention time: Better than 0.1%RSD Buffers Up to five buffers and one regeneration solution, all stored in plastic coated glass bottles under nitrogen pressure. Reservoir volume is 1.0 litre Ninhydrin Stored under inert gas in a 2.0 litres plastic coated glass bottle. Pumps Two dual piston pumps with integrated pressure transducer and drain valve. Ceramic pump head, sapphire pistons and valves. Electronically controlled piston wash.	1
17	Dage 4000 Shear Tester Required to measure the shear strength of samples.	1
18	CNS Analyser: For determination of carbon, nitrogen and sulphur from soil, plant and environmental samples through high temperature combustion. Measuring method: High temperature combustion method at 1150°C for complete sulfur recovery and subsequent gas analysis for N/Protein, CN or CNS; Detection ranges: Carbon: from ppm to 100% or 400 mg absolute; Nitrogen: from ppm to 100% or 150 mg absolute; Sulfur: from ppm to 100% or 15 mg absolute; Mode of operation: Fully automatic; With integrated 60 sample changer, PC-control through Windows®, Optional 21 CFR Part 11 compliant software is available	1
19	Gas Chromatography	1
20	PCR machine, 96 well, gradient	3
21	XRD: Crystallography Powder system	1
22	pH, Conductivity TDS Meter	5

Form- I

Technical Requirement

(To be filled by the bidder as part of Technical Compliance)

No	Item	Compliance Yes/No	Comment	Part No	Reference Brochure is at page #
A Equipment for Chemistry Lab					
1	pH, Conductivity TDS Meter:				
2	Hotplate with Stirrer:				
3	Water Still Merit:				
4	Conductometer:				
5	UV Lamp:				
6	Analytical Balance:				
7	Digital Oven: Int.				
8	Electrically Heated Muffle Furnace:				
9	Water Bath: Bath:				
10	Rotatory Evaporator System:				
11	Spectro UV-VIS Dual Beam & Auto Cell Scanning Spectrophotometer:				
12	UV Single Beam Spectrophotometer:				
13	FTIR spectrometer (bench-top):				
B Equipment for Department of Wildlife & Fisheries Lab					
1	Walk-in Cold Room 10'x10'x10' WALK-IN COLD ROOMS. Matrix.				
2	Camera fitted Light microscope with monitors and accessories.				
3	Inverted Microscope with monitors and accessories				
4	Autoclave Horizontal (large size)				
5	Telescope Saxon90 mm, Terrestrial Refractor Telescope				
6	Night Vision Equipment				
7	Shaker incubator				
8	Radio Telemetry Complete Apparatus				
9	Glass distillation plant complete with accessories.				
10	Electronic balance (Four Digit)				
11	Water bath (Temperature controlled)				
12	Refrigerators (12 cubic feet with stabilizer)				
13	Homogeniser				
14	Vortex				
15	Ice Flake Maker				
16	DO Meter				
17	pH Meter (digital bench model)				
18	EC Meter (digital bench model)				
19	Vacuum Oven				
20	Vacuum Pumps				
21	Light meter				
22	Turbidity Meter				
23	UV lamps				
24	Drying Cabinet				



25	Precision pipettes				
26	Freezer (-20 C)				
27	Blenders (various processing capacities)				
28	Liquid nitrogen flasks (Dewar)				
29	Microwave oven				
30	Automatic air compressor				
31	Oxygen Cylinder 48 CFT with trolley				
32	Microtome with accessories				
33	Chlorophyll extraction with filtration assembly vacuum pump,				
34	Automatic tissue processor				
35	Biohazard safety cabinets (Class II)				
36	Embedding center				
37	Incubator				
38	Laminar flow				
39	4 Ft Laboratory Fume Hood Bench Top Model				
40	Hot plate /stirrer				
41	Pipette Aid Automatic				
42	High speed re refrigerated centrifuge with accessories				
43	Protein Electrophoresis apparatus with all accessories				
44	Microplate reader with accessories				
45	Spectrophotometer with all accessories				
46	Cryotome with all accessories				
47	Bench top orbital shaker				
48	DNA concentration System with accessories				
49	Hybridization oven				
50	Microfuge high speed centrifuge machine				
51	Hydro Tech Gel Drying System				
52	Sonicator				
53	Vacuum Pump				
54	Vacuum Blotting system				
55	Eye wash station				
56	Polaroid gel documentation system				
57	96-Well PCR Thermal Cyclers (Thermocyclers)				
58	Trays for gels				
59	Lab Twin Screw Extruder				
60	Soxtec 1043 mit Service Unit 1046				
61	Flame spectrophotometer				
62	Micro Kjeldhal Apparatus				
63	Electrically Heated Muffle Furnace				
64	Feed mixture one ton capacity semi automatic				
65	Liquid Nitrogen cylinder				
66	Sieve shaker Mechanical with sieves set ASTM				
67	Magnetic Stirrer				
68	Incubator for BOD				
69	Biofilter				
70	Fiber glass tanks				
71	Pressure Chamber & Osmometer				
72	Chlorophyll Content Meter				

73	Electric - Electric/Wood/Coal Furnace				
C Equipment for Department of Physics Lab					
1	Oscilloscopes 20MHz 220 V AC 50-60 Hz				
2	Audio Generator 10 Hz to 1 MHz				
3	Analog Digital Trainer				
4	Digital Multimeter 200 mV – 1000 V 10A				
5	Bench-type Top LCD Digital Multimeter				
6	Fluke 8846A Digital Benchtop Multimeter				
7	Datalogging Heavy Duty Light Detector				
8	Analytical Balance Micro rays (0.1 mg)				
9	Gas Flow Meter				
10	Mortar Pestle (3set)				
11	Laser Power Meter				
12	Adventurer Electronic Balance				
13	LCR Meter frequency from KHz –MHz				
14	Constant current and voltage power supply				
15	Cryostat for Liquid Nitrogen of capacity(35 ltr)				
16	Temperature Controller				
17	Oscilloscope (dual trace 4 channel)				
18	Magnetic Stirrer				
19	Water Bath Capacity 15 liter				
20	Thermal cycling oven				
21	Nd YAG laser (solid state laser with first second and third harmonic generations) YAG Laser with Amplifier				
22	Spectrometer (LIBS 2500 Plus with 7 Channels)				
23	Turbo molecular pump, rotary pump,				
24	FC-3000 Flip Chip Bonder				
25	Delay Generator				
26	Vacuum Chamber with 7 ports, Chamber stand and other Accessories for vacuum Chamber				
27	Optics for laser, Optics table, magnetic mounts etc.				
28	Vacuum chamber				
29	High temperature furnace				
30	Ball Mill				
31	Air Sampler				
32	Hydraulic press (20 ton)				
33	Oven (200 °C)				
34	Centrifuge Machine Ultra – 50000 RPM				
35	Portable Metal Hardness Tester,				
36	Microcontroller Burner And Programmer				
37	Solar Power System				
38	WIEN2k Software				
39	Humidity chamber up 90% RH.				
D Equipment for Applied Chemistry Lab					
1	Differential scanning calorimeter (DSC),				
2	Thermo-mechanical Analyzer				
3	Oven (Digital)				
4	Analytical balance				
5	GC-MS,				
6	Air Conditioner				

7	Optical microscope				
8	Rotatory evaporator				
9	Water deionizer				
E. Equipment for Department of Microbiology & Physiology Lab					
1	Micro Dispenser				
2	Portable Balance				
3	Egg Candler Local Made				
4	Colony Counter,				
5	Staining Rack				
6	Water Bath				
7	Phase Contrast Microscope				
8	Refrigerator 586 l.it, HRB 701-F				
9	Autoclave				
10	Centrifuge				
11	Micro Filtration Apparatus				
12	Gel Documentation GenoSmart				
13	Horizontal Electrophoresis Apparatus				
14	Inverted Microscope With Camera				
15	Micro Wave Oven				
16	Shaker Digital				
17	UV-VIS Dual Beam 8 Auto Cell Scanning Spectrophotometer				
18	Vertical Gel Electrophoresis Unit				
19	Water Still Glass				
20	Water Purification System				
21	Anaerobic Jar				
22	Microbiological safety cabinet Class II type A				
23	Conductivity Meter				
24	COOLED INCUBATOR				
25	DIAREADER Universal NB				
26	DIAWASHER II Microplate Washer				
27	Fluorescence Microscope with Trinocular Head				
28	4 Ft Laboratory Fume Hood Bench Top Model				
29	Ultra Turrax T25basic Homogeniser				
30	Laminar Air Flow (Vertical)				
31	Lyophilizer / Freezer Dryer				
32	Refrigerated Centrifuge Machine,				
33	Thermal Cycler				
34	Ultra-Sonifier				
35	Fermenter 6.7 Liters				
36	Ordinary Light Microscopes				
37	Surgical Box Stainless steel,				
38	Micro Dispenser (Single Channel)				
39	Bp Apparatus Auto/ Manual,				
40	Animal Cages,				
41	Hot Air Oven				
42	Incubator				
43	Vortex				
44	Homogenizer				
45	pH Meter				
46	Water Distillation Apparatus				
47	Inverted Microscope				
48	Micro Dispenser (Multi Channel)				
49	Elisa Plate Reader				
50	Power Lab				
51	Hot Plate				
52	Blood Autoanalyser				

F Equipment for Environmental Sciences Lab				
1	Analytical Balance:			
2	ISS perusal piously TDS Meter			
3	Digital Sound Level Meter			
4	Water Flow Meter			
5	Digital titrators			
6	Multimeter			
7	Sulphur dioxide SO ₂			
8	Oxides of Nitrogen as NO			
9	Oxides of Nitrogen as NO ₂			
10	Tropospheric Ozone O ₃			
11	Suspended Particulate Matter SPM			
12	Respirable Particulate Matter PM ₁₀			
13	Digital CO Meter:			
14	Portable Airborne Lead & Lead Dust Monitor			
15	Portable CO ₂ Meter			
16	Digital Sound Level Meter			
17	Ultra Micro Balance			
18	Distillation Unit			
19	GARMIN GPS ETREX LEGEND HCX:			
20	Light microscope			
21	Centrifugation Machine (250 ml)			
22	Gel electrophoresis tray			
23	PENETROMETER Micrometric Vertical Adjustment.			
24	POCKET PENETROMETER			
25	Gel Documentation GenoSmart Digital Video System with Integral LCD Monitor			
26	Stack/Flue Gas Analyzer			
27	Eppendorf Micro centrifuges			
28	Vortex Mixture			
29	Orbital Shaker			
30	Arc GIS License			
31	Total Organic Carbon (TOC)			
32	Atomic Absorption Spectrometer F/GF ASTM D 5863 - IP 464 - IP 285			
33	Universal Mutation Detailer System			
34	Autoanalyser-3 HR			
35	Dionex Ion Chromatograph			
36	Gas Analyser			
37	Constant room temperature/Growth rooms			
38	Cold room			
39	Kjeldahl Distillation Unit:			
40	Temperature control water bath			
41	Water De-ionizer			
42	Stereo Microscope			
43	Nanodrop Spectrophotometer			
44	Portable Total Suspended Solids (TSS) Meter			
45	Chemical Oxygen Demand (COD) Meter			
46	Biological Oxygen Demand (BOD) Meter			
G Equipment for Food Science Lab				
1	Fully Automatic Hematology Analyzer			
2	Analytical Balance			
3	Digital Brix Refractometer			
4	Laboratory centrifuge			



5	Colony Counter (BioCounter Automatic colony counter)				
6	Micro quant Power 100-240 VAC 50/60 Hz				
7	Laminar Cabinet Flow				
8	Lacto scope compact				
9	Hand Refractometer				
10	pH Meter				
11	Cheese Vat				
12	Automatic Isoperibol Calorimeter with Oxygen Combustion Bomb, Oxygen Regulator, Nitrogen Regulator, Rinse Tank, 500 Firings Kit, Printer				
13	Water Purification System Millipore				
14	Unit Gel Electrophoresis Midi Horizontal				
15	Rotary Evaporator				
16	Low Temperature Freezer				
17	Grinding Mill				
18	Digital Weighing Balance				
19	Small Scale Dehydrator				
20	Fruit Grader				
21	Ice Cream maker				
22	Visco Meter				
23	Amylogram/ Amylograph				
24	Mixogram				
25	Farinogram/ Farinograph				
26	Fruit Sorter				
27	FPLC (Fast Protein Liquid Chromatography)				
28	Baking Line,				
29	Digital Burette				
30	Blood Shaker with accessories				
31	Digital Stadiometer with accessories				
32	Digital Body Composition Scale with accessories				
33	G. C. IIb. Meters with accessories				
34	Digital Peak Flow Meters with accessories				
35	Digital Oxymeters with accessories				
36	Pulse Rate Meter digital with accessories				
37	Micropipettes with accessories				
38	Multichannel Micropipettes				
39	Ultra Temperature Controlled Freezer (-80 C),				
40	Positive Displacement Micropipettes				
41	Vacuum Sealer Digital				
42	Nitrogen Evaporator				
43	Texture Analyzer				
44	Fluorescence Detector				
45	Ultrasound Assisted Extraction with accessories				
46	Lyophilizer with all accessories				
47	Pilot Plant for Fruit Dehydration				
48	UHT Milk Production Unit				
49	Pilot Plant for Juice Concentrates,				
50	Pasteurization and Cooling Tanks				
51	Spray Dryer				
52	High Pressure Homogenizer				
53	UV Spectrophotometer				
54	Kjeltec Protein Estimation Unit,				
55	Soxhlet Extraction Unit (6 Units)				
56	Blanching and Washing unit,				
57	Semi-Automatic Food Packaging Machine				
58	Laboratory Muffle Furnace				

59	Digital Flame Photometer				
60	Water Deionization Unit				
61	Bread and Pizza Proofer,				
62	Fruit and Vegetable Cutting Tables				
63	Hot Air Oven,				
H Equipment for Bioinformatics & Biotechnology Lab					
1	Real Time PCR				
2	Nanodrop				
3	Ice Machine				
4	ELISA Reader				
5	Mini Protean Tetra Cell Gel electrophoresis apparatus				
6	Temperature controlled centrifuge machine				
7	Dry bath incubator,				
8	Mini tank Electrobloetter				
9	Plant growth Chamber (Programmable),				
10	Freezer				
11	CO ₂ incubator				
12	Inverted microscope				
13	PCR machine,				
14	Laminar flow clean bench				
15	Tube incubator (1.5ml)				
16	Analytical balance				
17	Digital Pipetteman (complete set)				
18	Electrical balance				
19	Gel documentation System				
20	Incubator				
21	Magnetic stirrer				
22	pH meter				
23	Air conditioner (1.5 ton)				
24	Refrigerator (4°C, -20°C)				
25	Shaker Shaking/Mixing				
26	Vortex Mixing				
27	Water bath				
28	Autoclave machine (varying capacity)				
29	Glassware drying cabinet				
30	Liquid nitrogen tank				
31	Water double distillery				
32	Microscope (Compound/Light)				
33	Microwave Oven				
34	Mini spin Centrifuge				
I Equipment for Central Hi-Tech Lab					
1	Spectrophotometer double beam with accessories				
2	H.P.L.C (Gradient System)				
3	Atomic Absorption Spectrometer.				
4	F.T.I.R Spectrometer				
5	Inductive Couple Plasma(ICP)				
6	Electric Muffle Furnace 1600C				
7	Electric balance 0.01mg				
8	ULTRA Centrifuge Machine				
9	Rheometer 0.001 to 200mN.m				
10	Single Crystal Diffractometer, 50Hz				
11	APEX II 16 Megapixel Detector.				
12	Kappa 4- axis Goniometer				
13	Elemental Analyzer				
14	Simultaneous DSC –TGA				



15	Dynamic Mechanical Analyzer				
16	Fully Automatic Amino Acid Analyzer				
17	Dage 4000 Shear Tester				
18	CNS Analyzer				
19	Gas Chromatography				
20	PCR Machine				
21	XRD Powder System				
22	pH Conductivity TDS Meter				

G	Implementation Services				
J	Warranty Services				



- 6.5 Invoices regarding SLA services (as mentioned in Technical and Financial bids) will be cleared as soon as possible not exceeding 30 days upon receiving the invoice and complete supporting documents.
- 6.6 Taxes if applicable will be deducted at source as per Government rules at the time of payment.
- 6.7 The bidder is responsible to deliver equipment at the sites at his own risk and cost.
- 6.8 All payments shall be made as per Government Finance Rules.

7 LIQUITDATED DAMAGES

- 7.1 In case of delay, the Project Directorate reserves the right to impose a penalty not exceeding 10% of the total amount of the contract at the rate of 1 % of the bill for each month of delay.

