

REQUEST FOR PROPOSAL

For Procurement of Scientific Equipment
Sardar Bahdur Khan Women's University Quetta



Submission Deadline: 13th Dec 2016 at 11:00 AM

Tender Opening: 13th Dec 2016 11:30 AM

Vender Name: _____

Tender Form

Sardar Bahdur Khan Women's University Quetta. www.sbkwu.edu.pk
Tel: +92 (081) 9213303-5,

1. Name & Address of the Supplier _____

2. Sale Tax Registration No: _____

3. Income Tax Registration No: _____

4. Telephone No: _____

5. Cell No: _____ **Bank Challan#** _____

1.0 Introduction

The Sardar Bahadur Khan Women's University plans to strengthen its existing Lab for Department of Botany, Chemistry, Zoology, Biotechnology and Environmental Sciences department. The main purpose of this procurement is to facilitate student and faculty to enhance research activities at SBKWU, Quetta by utilizing fully equipped labs.

2.0 Functional Requirements for SBKWU Labs

1. Supply, Installation, Integration, Testing and commissioning of all equipment and components requested in BoQ.
2. Extend the warranty/ services of the work performed as per the requirement of SBKWU.
3. At the time of installation and commissioning, vendor shall provide comprehensive documentation of system deployed
4. The selected bidder shall supply and install the equipment.
5. Terms of warranty should be clearly stated.
6. Bidders are required to quote the prices on C & F and FOR basis all equipments.

3.0 Trainings

Trainings for Technical staff shall be arranged by the contractor according to the requirements of equipments at SBK and for nominated members by SBKWU.

4.0 Proposal Instructions

- 4.1** Bidders are requested to read carefully the following terms and conditions and sign all pages of the Tender Document in token of having understood and accepted all the terms and conditions therein. All or any of the provisions of the terms and conditions may be changed/alterd/modified/deleted/added or amended by the University as and when deemed suitable/necessary.
- 4.1** Any prospective bidder can procure the Tender Document from the office of the Purchase officer, SBK Women's University Quetta. Tender Document is available on all working days for a fee of Rs. 2000/- (non- refundable). The Tender can also be download form http://www.sbkwu.edu.pk/sbkwu_new/tenders/
- 4.2** The payment of equipment is coupled with installation / commissioning of equipment; therefore, supplier should make sure that bid is complete in all respects including accessories.
- 4.3** Telephonic / telexed / faxed / telegraphic quotation will not be entertained.
- 4.4** The bidders must enclose Manufacturer Authorization Certificate from their Principals or authorization certification of the Principal, failing which their offers will be rejected
- 4.5** Catalogs, brochures or any printed material included about manufacturer, Name of dealers and specification for required items must be provided.
- 4.6** The SBKWU will not be responsible for any costs or expense incurred by Bidders in connection with the preparation or delivery of bids.
- 4.7** Non-Black List Certificate (confirming that bidder has not been blacklisted by any Government / HEC.
- 4.8** All the electric/electronic appliances supplied by firms should run on 220 volts.
- 4.9** Delivery of Item will be free of charge at SBKWU during the office hours with a copy of delivery challan.

- 4.10 Part/advance payment will not be entertained; the payment will be made after complete delivery of ordered items & inspection by the authorized person.
- 4.11 All equipment should be brand new and according to ordered specification from the current production and covered under minimum manufacturer 1- **years warranty / guarantee** etc. as mention in the quote. Brochures and product details must be attached. Vendor should pass on manufacturer on year warranty. Furthermore, the vendor must sign up for SLA (Service Level Agreement) of three years. The three year SLA period will start after elapse of one year warranty period. This will include service, technical support and training of SBKWU personnel for the above mentioned period. The SLA may be further enhanced based on the satisfactory performance of the vendor.
- 4.12 In case of failure to complete the work by the agreed upon scheduled dates, SBKWU will have the right to take remedial action which may include but not limited to, imposition of financial penalties up to 2% of the component cost per week of delay and /or termination of the contract.
- 4.13 **The successful bidders will have to submit 10% performance security in the shape of CDR in favor of Treasurer SBKWU Quetta against Supply Order issued to them for period of warranty of Permanent Equipment.**
- 4.14 In case of any dispute between the purchaser and supplier, the decision of the Vice Chancellor shall be final which shall not be challenged in any court of Law.
- 4.15 Installation/training time, if any, after delivery within the 120 days.
- 4.16 Demurrage charges in case of late supply of shipping documents shall be born by the supplier.
- 4.17 Any condition mentioned by the bidder in consistent with term and conditions of the tender shall have no weightage.
- 4.18 In case of failure to complete the work by the agreed upon scheduled dates, SBKWU will have the right to take remedial action which may include but not limited to, imposition of financial penalties up to 2% of the component cost per week of delay and /or termination of the contract.
- 4.19 Country of origin should be Japan/USA/UK

5 SCOPE OF SUPPLY

- 5.1 The bidder shall supply/ Install/Commission equipment/items, of the specifications given in the tender document. The bidder shall also be responsible for their installation, compatibility and configuration; free service within the range of the warranty from the date of the equipment makes warranty functional. All equipment should be accompanied by service manual separately in English.

6 BID PRICE

- 6.1 The bidder shall indicate in his offer, list of equipment with specifications, standard accessories, make and country of origin, the unit price inclusive of all taxes and total bid price of the goods. Vender is required to submit their tenders on C&F basis on manufacturers Performa invoice
- 6.2 Price of optional accessories should be quoted separately.
- 6.3 **Taxes levied by the Government and freight charges, if any, shall be paid by the bidder and must be included in the quoted prices.**

7 CURRENCIES OF BID

- 7.1 The prices shall be quoted in Pakistani rupees in Case of FOR and payment to the successful firm will be made in the same currency.

8 BID VALIDITY

- 8.1 The bid shall remain valid and open for acceptance of the purchaser **for a period of 90 days from the specified date of opening.**

9 BID EARNEST MONEY

- 9.1 The bidder shall furnish, as part of his bid, earnest money equal to 2% of quoted price with their offer in the form of demand draft/ pay order in favor of **Treasurer, Sardar Bahadur Khan Women's Univeristy ,Quetta.** The Demand Draft shall be returned to unsuccessful bidders. The Earnest Money will be forfeited if a bidder withdraws his bid during the period of his bid validity or fails to supply the machinery / equipment ordered by the university.

10 DOCUMENTS COMPRISING OF BID

Single stage two envelopes method will be adopted for this tender comprises of Technical and Financial Bid

10.1 Technical proposal

A technically eligible bidder, based on conditions listed in this document, not meeting the 70% pass marks will be rejected in Technical Evaluation, and its sealed/unopened Financial Proposal shall be returned back. All bidders scoring greater than or equal to 70% of the marks will be accepted in technical proposal, and their financial bids will be opened. The technical proposals shall be evaluated by the technical evaluation committee in the light of following evaluation criteria:

Eligibility Criteria

1. Valid NTN No
2. Valid GST NO
3. Valid authorized Distributor/Partner/ Reseller
4. Detailed company profile

S.No	Attributes	Score	Score Distribution	Requirements
1	Authorized Distributor	20	20	
	Dealer		12	
	Reseller		8	

2	Company Office	5		
	Company office in Quetta		3	
	Offices in other cities		2	
3	Similar projects Completed (Similar projects of same scope undertaken in Pakistan – Documentary proof/evidence required)	10	10	More than 10 projects
			05	7 Projects
			03	5 Projects
			0	Less than 5 projects
4	Similar Projects in Hands	10	10	More than 10 Project
			5	More than 7 Project
			3	More than 5 Project
			0	Less than 5 projects
5	Technical Brochures / Literature of the quoted product	05	05	All supporting documents/ brochures / literature of product
			03	Documents with limited technical detail
6	Warranty Support and Service on equipment	15	15	3-Year Warranty and Services
			5	3-Year Warranty and 1-Year Services
			2	Warranty and Services for 1 year
			0	Warranty only or Less than 1 year
7	Technical Team / Company Qualified Engineers (with profiles)	15	15	More than 10 Technical Employees
			7	7 Technical Employees
			5	5 Technical Employees
			0	Less than 5

8	Compliance of Technical Quoted Items with RFP	20	20	100% Compliance
			15	75%
			10	60%
			5	50% or low Compliance
9	Financial Health Certificate of last five years	20	Attach: 1. To-date Bank Statements 2. Copy of Financial Statements	
	Working Capital		10	
	1. To-Date Balance of Bank Account 2. Credit Facility Bank Letter if Required		10 10	

10.1 Financial Proposal

Financial Proposal comprises of rates inclusive of all taxes

S. No	Description	Quantity	Rates	Taxes	Total
1					
2					
3					
4					
		Total			

BOQ

Detail of Required Equipment			
Lab Equipment for Chemistry Department			
S #	Description	Specification	Quantity
1	Refrigerator	horizontal system + 20x10 & 20x20 cm gel ,Electrophoresis Unit, Gel Caster Unit, Combs, Electrode assembly, electric supply	3
2	Deionizer Plant with four cartridges	Treated Water Quality Conductivity: 1 – 0.1 $\mu\text{S} - \text{cm}$ Resistivity: 1 – 10 M Mohms - cm Silica: <0.05 mg / l Residual Solids: <0.5mg/l Liters capacity: 216 72 43 31 24 20 Max flow: 30 lit / hour Max pressure: 10 psi / 0.7 bar	2
3	Water Distillation Plant Water Still	Water Still output 4 litres/hr, single distilled pH 5.0 – 6.5 Conductivity, μScm^{-1} 3.0 – 4.0 Resistivity, mOhm-cm 0.25 – 0.3 Temperature 25 - 35°C Pyrogen content * Pyrogen free Water supply 1 litre/min 3 – 100psi (20-700kPa)	2
4	Top loading Balance	READABILITY: 0.001gCAPACITY: 310g PAN SIZE: \varnothing 100mm Analytical Balance high sensitivity for Chemistry Lab	3
5	High performance electric vacuum pump 1/4HP--1 HP /1.5CFM--12CFM/110V--220V with CE,UL,CSA certificates	Use to removes gas molecules from a sealed volume in order to leave behind a partial vacuum.	2
6	Pestle and mortar	Use to ground, crushed or mixed the substances .	1
7	Bunsen burner	Use for heating, sterilization and combustion .	10

8	Circulating Water Bath	Capacity: 14 liters Working dims: 219w x 298d x 150h mm Overall dims: 361w x 332d x 170h mm Heated, Watts: 1250W Pump capacity: 10-l/ min Pump pressure: 1.5 m head Voltage: 230V	2
9	Chromatographic tanks and Glass columns	Use for the purification and identification of mixtures components .	5
10	Magnetic Stirrer/Hot Plate detailed specification	Plate Materials : Glass Ceramic Plate Dimensions, mm 150 x 150 Heated Area, mm 120 x 120 Heater Power, Watt 500 Max plate temp, °C 450 Stirrer Speed, rpm 100 – 2000 Maximum Stirring Capacity, L*15 IP Rating 32 UC152 Stirrer/hotplate, ceramic plate	3
11	UV-Lamp	For the visualization of compounds on TLC plates .	2
12	Shaker	Shaking action Orbital Platform dimensions, mm (w x l) 335 x 335 Speed range 30 to 300rpm Orbit / amplitude, mm 16 Maximum load, kg 10 Dimensions, mm (w x d x h) 360 x 420 x 270 Operational temperature range +4 to +40°C Maximum permissible humidity 80%	1
13	Centrifuge machine	14000 rpm with 2 rotor	1
14	Laminar Flow Hood	Cleanliness: Class 100@>0.5m Average with speed: 0.3-0.6m/s (Adjustable) Noise: <60dB(A) Vibration and Semi-peak value<3*m Illuminance>300LX Daylight & U.V lamp 18Wx120Wx1 Maximum Power: 0.4kw Voltage: 220V 50Hz Specification and quantity of (HEPA) 820x600x50x1 Size of working room LxWxH (mm): 880 x 680 x 470	1

15	pH-meter	<p>Range: -2 to 19.999 pH, Resolution: 0.001/0.01/0.1pH, Accuracy: ± 0.003, mV range: ± 1999mV, Resolution: 0.1 mV, Accuracy: ± 0.2mV</p> <p>Temperature: Range: -10 to +105 °C (14 to 221°F), Resolution: 0.1°C (1 °F)</p> <p>Accuracy: ± 0.5°C (± 1°F), ATC range: 0 to 100 °C (32 to 212°F), Manual temp. Comp: 0 to 100 °C (32 to 212°F)</p>	2
16	High Performance Liquid Chromatograph HPLC	<ol style="list-style-type: none"> 1. Solvent Delivery System for Micro, Semi-Micro, Analytical, Semi-Prep Flow Rates 2. On-line Degasser 3. Photodiode Array (PDA) UV-Vis Detector 4. Auto-Sample Injector 5. Column Oven 6. System Controller 7. Data Management System 8. Others <ol style="list-style-type: none"> 1. Solvent Delivery System for Micro, Semi-Micro, Analytical, Semi-Prep flow rates 1. It should be a Low-Pressure, Quaternary Gradient pump 2. It should have a flow rate resolution of 3nl/min 3. The flow rate should be set between 0.0001 to 10 ml/min from micro to semi-preparative flow rates without any hardware changes 4. Flow rate accuracy should be $\pm 1\%$ or ± 0.5 ul/min of set value whichever is larger 5. Flow rate precision should be less than $\pm 0.1\%$ RSD 6. Pressure setting range should be 1-40 MPa 7. It should employ active check valves that allow stable delivery of even non-polar organic solvents such as hexane 8. It should be capable of standalone operation 9. It should have up to 20 storage files 10. It must be capable of upgrading to a high pressure (up to ternary) gradient operation if required 11. Maintenance kit, reservoir tray with 4 solvent bottles complete with fittings and automatic rinsing kit must be supplied 12. It must have a leak sensor as safety feature 	2

13. It should have functions for maintenance and validation which are accessible by a dedicated operation button Degassing Unit

1. Membrane degassing unit for five flow lines
2. Maximum operating flow rate up to 20ml/min per flow line
3. An internal capacity of 170 ul per flow line that allows a significant decrease in time required for replacing mobile phases and stabilization
4. It must have a leak sensor as a safety feature
5. Error status shall be transferred to the operating software
6. It should include a drain-pan
7. Self-cleaning capability that extends vacuum pump life by drawing in air when the pump is running
8. The liquid contact surfaces of the degasser should employ special synthetic polymers designed for all solvents

3. UV-Vis Detector

1. The detector must have 2 modes of operation using a variable slit: High Resolution mode at a slit width of 1.2nm and a High Sensitivity mode at a slit width of 8nm
2. Wavelength range 190 nm - 800 nm
3. Newly designed photo-diode array detector with 512 elements and an element resolution of 1.2nm/element
4. The flow cell must be temperature controlled from 5°C above ambient temperature to 50°C
5. Wavelength accuracy ± 1 nm
6. Light Source D2, W, D2 + W lamps (3 modes)
7. Drift Less than 5×10^{-4} AU/Hour
8. Noise Level $\pm 0.6 \times 10^{-5}$ AU
9. Linearity of 2.0AU (ASTM method)
10. It should have automatic wavelength accuracy check at 4 wavelengths (UV & Vis) & wavelength correction
11. Number of different wavelengths to be monitored & quantitated simultaneously: 8
12. It should have a self-aligning mechanism

for the light sources and cell to allow alignment-free installation from the front
13. It must have data buffering function to collect up to 20 min of data for all wavelength regions if PC malfunctions

14. Analytical cell to be supplied as standard

4. Auto-Sample Injector

1. Sample injection volume should be variable between 0.1 ul to 100ul; up to 2000ul optionally.

2. Injection system should be variable injection volume type with zero sample loss during injection

3. It must be capable of fast injection time of 10sec/sample

4. Number of samples to be processed automatically, random access up to 175 positions for 1ml vial volume, 115 for 1.5ml, 50 for 4ml, 192 for 2X96 wells microtiter plates, 768 for 2X384 wells microtiter plates, 192 for 2X96 wells deep-well plates

5. Flow line rinse capability both before and after sampling should be possible

6. Needle aspiration speed should be variable from 0.1 to 15ul/sec

7. Rinse aspiration rate should be variable from 1 to 35ul/sec

8. It must be capable of a carry-over no more than 0.005 %

9. Injection volume accuracy within 1%

10. The injection precision should be less than 0.2% of RSD value

11. Maintenance kit should be quoted

12. The system must have a sampler cooler with a temperature range of 4° C ~40° C.

13. It should have a leak sensor, automatic rack and vial recognition as safety feature

15. It should have functions for maintenance and validation which are accessible by a dedicated operation button

16. It should be capable of coupling to an automatic rack changer in the future for high throughput analysis

17. Supply of at least 100 sample vials of 1.5ml capacity, complete with caps and septa

should be included

5. Column Oven

1. It should be forced-air-circulation type for uniform temperature distribution with a quick feedback mechanism to maintain constant temperature level even when power source voltage fluctuates
2. The temperature range should be ambient - 10oC to 85oC
3. Temperature control precision should be ± 0.1 oC
4. The oven should have temperature limit device and temperature fuse and a solvent leak sensor
5. It should have functions for maintenance and validation which are accessible by a dedicated operation button
6. Capable of complex temperature programming in linear and step programs
7. It should have built-in slots for valve control functions
8. It should be able to handle up to 6 x 30 cm columns

6. System Controller

1. It should function as a communication bus module with data buffering capability
2. It should acquire up to 24 hours for one analysis, at 500ms sampling rate
3. It must be controllable from a web-based interface via a network. It allows the system to be controlled, monitored and maintained via Internet Explorer Web browser
4. It must be compatible with wireless networking
5. It must come with Expert function in that if pressure falls below specified value, the expert function will automatically purge the mobile phase
6. It should store up to 20 analysis files with a total up to 400 steps of time programs

7. Data Management System

- a) Personal Computer

1. Pentium D processor, 1.86GHz or higher
2. 1.0GB RAM on board or higher
3. 160 GB hard disk or higher
4. DVD-RW ROM
5. 17 " LCD color monitor
6. 101 keys key board
7. Mouse and Mouse Pad
8. Pre-installed latest MS DOS and MS Vista Business edition
9. Laser printer

b) Software

1. Operation of the system should be very easy and intuitive via a state-of-the-art 32 bit MS Vista based software
2. It should be capable of control of up to 4 HPLC systems and data acquisition of up to 8 channels (2 detectors for each system). The monitoring of all the four HPLC systems simultaneously should be possible
3. It should cover full one-point digital instrument control, qualitative and quantitative processing, report creation and self-diagnosis
4. Sample schedule wizard function should be standard
5. There should be an on-line help function context sensitive
6. The reporting format should be flexible and easy to use in any desired format
7. The data can be converted to other formats. Spread Sheet software and word-processing software can be readily employed to provide data in tables or graphs through industry standard protocols
8. The software should allow automatic execution of system checks, auto-purge and baseline checks
9. Software must have its own log files for complete audit trails
10. System suitability, System security as well as System check functions must be provided which comply with Good Laboratory Practice (GLP) and Regulatory Conformity

		<p>8. Others</p> <p>1. The supplier must provide training for the users of the instruments at site as well as at the supplier's application laboratory, after installation and commissioning. Details of the training program must be attached with the tender.</p> <p>2. The supplier must demonstrate that it has a proven appropriate set-up and capability to provide after-sales service efficiently and effectively. The supplier should have in his facility a similar system to that proposed in this tender for training purpose.</p> <p>3. Software upgrades like version ups, if any, should be done without any cost</p> <p>4. All modules must be GLP compliant</p> <p>5. A declaration of Conformity certificate must be provided</p>	
17	Distillation unit	Output 4 litres/hr, single distilled, pH 5.0 – 6.5, Conductivity, μScm^{-1} 3.0 – 4.0, Resistivity, mOhm-cm 0.25 – 0.3, Temperature 25 – 35°C Pyrogen content * Pyrogen free, Water supply 1 litre/min 3 – 100psi, (20-700kPa), Electricity supply 220 or 240V, 50-60Hz, single phase, Power requirement 3kW, Dimensions, (wxdxh), mm 500 x 150 x 450	2
18	Oven	Maximum Temperature Range: 250 - 300 °C Usable Volume: 150 liters , Internal: 520 x 530 x 540mm H x W x D , External: 650 x 850 x 650mm H x W x D , Power rating: 1750W , Shelves supplied: 3 Nos. Shelf positions: 5 positions	3
19	Gel Electrophoresis Horizontal	horizontal system + 20x10 & 20x20 cm gel ,Electrophoresis Unit, Gel Caster Unit, Combs, Electrode assembly, electric supply	3

<p>20</p>	<p>Atomic Absorption with Graphite Furnace and Autosampler</p>	<p>The equipment must come from a reputable brand in the market with direct manufacturer support - engineer, application and logistics locally.</p> <p>2. Flame atomizer and furnace atomizer units should be provided within single compartment with front-back switchover for space-saving compact design.</p> <p>3. Changeover between flame and furnace atomizer units should be completely automatic using software The AAS must have measurable wavelength range from 185.0 to 900.0 nm.</p> <p>5. Spectrometer must work in emission mode as well as absorption mode.</p> <p>6. Spectrometer must have minimum 6-lamp turret supplied with capability to lit 2 lamps simultaneously (to avoid delay between two methods).</p> <p>7. The monochromator must be aberration-corrected Czerny-Turner mounting with at least 300 mm focal length. Diffraction grating area must be at least 40x 40mm with ≥ 1800 lines/mm grooves.</p> <p>8. The monochromator must use non-spherical toroidal mirrors to optimize the focusing characteristics at the inlet of the monochromator to reduce optical aberrations.</p> <p>9. Spectral bandwidth selection must be automated with choice of at least 4 slit sizes within 0.2- 2.0 nm range.</p> <p>10. Detector must be of wide-range photomultiplier with auto-gain function to reduce the effects of atomic emission interference.</p> <p>11. Optical system must consist of 3 dimensional layout double-beam optics with optical double-beam for excellent stability in</p>	<p>1</p>
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flame measurement and high-throughput single-beam in furnace measurement for higher sensitivity. The photometric system must be set automatically.

Flame Atomizer:
12. Flame atomizer must be able to operate Air-C₂H₂, N₂O-C₂H₂ flames with automatic changing between the two flame types.

13. Burner head must be made from highly resistant titanium with 10 cm slot size (5 cm titanium slot burner for N₂O-C₂H₂ flame must be available).

14. The burner angle should be adjustable from 0 to 90° to extend working concentration range (not possible in case of dual atomizer system with furnace).

15. Nebulizer must be Pt-Ir capillary type with PTFE orifice and ceramic impact bead; capable of handling hydrofluoric acid containing samples.

16. The burner chamber must be made from inert engineered plastic with angled design to minimise drain accumulation.

17. Burner atomizer must have ability to align burner head at optimal lateral and vertical position automatically using software

18. Also system must be able to do automatic search for optimum fuel flow rate to achieve maximum sensitivity.

19. Two types of background (BG) correction methods must be provided for flame technique with at least one background correction method applicable over entire wavelength range 185-900 nm.

20. System must be provided with the safety measures such as : a) Gas pressure monitor b) Ability to automatically detect fuel gas leak, when the power is turned on, c) Flashback detection, d) Flame monitor, e) Prevent use of

incorrect burner head, f) Drain tank level monitor, g) Automatic flame extinction upon power outage or sudden power interruption, h) Internal fan stop sensor, and i) Use of flame-retardant materials for the instrument external covers and atomizer unit.

21. System must include earthquake/vibration sensor to perform automatic flame extinguishing in case of emergency.

22. Autosampler for flame mode analysis must have the following features:
a. Auto sampler should be directly triggered from AAS unit via RS-232 communication having completely software controlled operation.

b. Autosampler should have minimum 65 vial positions of ≥ 15 mL vial capacity.

c. Rinse port with overflow wash mechanism should be provided to avoid any carryover or contamination from autosampler probe between two sample runs.

d. Autosampler should permit random access to any vial location of samples and standards.

e. Minimum 60 sample vials (≥ 15 mL) and one rinse bottle (container) of ≥ 2 L size should be provided along with autosampler.

f. flame microsampling mode i) Suitable for analyzing small volume precious samples with < 100 μ L sample injection and ii) Capable of automatic standard preparation (from stock) and automatic dilution of over-range samples up to 300-fold.

Furnace Atomizer:

23. The heating temperature range for furnace must be from ambient to 3,000 °C.

24. Furnace atomizer must be provided with two gas inlets (one for inert gas like argon; and second for oxidative gas like air).

25. The furnace heating control system should have digital temperature control using optical sensor during pyrolysis and atomization steps.

26. The furnace heating programme must

allow to set up to 20 stages with either ramp or step heating mode.

27. Inner gas flow rate range of 0 to 1.50 L/min with capability to perform automatic switching of 2 gas types in single method should be possible.

28. System should have high-sensitivity mode setting and capability to increase sensitivity up to 20 times using boosting function.

29. Automatic optimum temperature search function for furnace program should be provided.

30. Furnace atomizer unit must have ability to align furnace at optimal lateral and vertical position for best sensitivity automatically using software .

31. Two types of background (BG) correction methods must be provided for furnace technique with at least one background correction method applicable over entire wavelength range 185-900 nm.

32. System must be provided with the safety measures such as : a) Cooling water flow rate monitor, b) Gas pressure monitor, c) Overcurrent protection unit (double check by circuit protector and optical sensor), and d) Furnace block cooling check.

33. Color GFA-TV should be able confirm the position of sample injection and view the analysis in real-time mode during method development Utility requirements:

34. Main AAS unit and all accessories should be capable to operate with single phase power supply of 200-240V.

35. Cooling water circulator (chiller) should be provided for furnace operation as standard with instrument and not from local supplier.

36. Single hose exhaust should be sufficient

for total AAS system.

Software:

37. Operation of the system should be easy and intuitive via Windows 7 Operating System.

38. Software measurement mode must comprise of flame method and furnace method with display of signal analog output for two channels (atomic absorption and background signal).

39. Software must have automatic baseline correction of baseline drift and automatic calibration curve correction function using sensitivity monitoring.

40. Software should calculate and display sample concentration using either calibration curve method or standard addition method; based on sample volume, dilution rate, fixed volume and factor inputs.

41. Software must have capability to analyse up to 20 replicates and must display average value, standard deviation (SD) and RSD values directly.

42. The furnace technique signal processing should be possible with both peak height and peak area.

43. Software should automatically check for proper functioning of lamp, detector and background corrector before starting analysis.

44. Software must be able to record the used lamp time (hours) and monitor lamp warming-up time.

45. Sample results must be displayed in table or worksheet format which is easy to print, copy and report.

46. Software should have security management using login ID and password to have controlled user access based on user

privileges. Software should have log record, audit trail and electronic signatures. Others requirements:

47. Compliance: All modules must be GLP/GMP compliant/ a declaration of Conformity certificate must be provided.

48. Instruction Manual: Hardcopy of the instruction/ user's manual for main instrument and all other accessories must be included in the quote.

49. Training: The supplier must provide training for the users of the instruments at site as well as at the supplier's application laboratory, after installation and commissioning. Details of the training program must be attached with the tender.

50. System Warranty and Technical Support

- On installation, commissioning and training (one vendor support) by factory-trained Engineer is required.
- The Tenderer must have a local dedicated team, consists of sales, engineers and application engineers from direct factory/manufacturer for optimum support of the system
- The supplier must demonstrate that it has a proven appropriate set-up and capability to provide after-sales service efficiently and effectively. The supplier should have in his facility a similar system to that proposed in this tender for training purpose
- The facility should be equipped with a Wet Chemistry Laboratory with Class 2 Biosafety Standards suitable to conduct biological testing.
- Back up equipment support for testing must be available at the supplier's facility during equipment breakdown.
- Comprehensive support for equipment for a period of ____ months which will consist of the following at no extra cost:
 - a) Unlimited service calls
 - b) Travel and Labor expenses of Customer Engineer

- c) Service Parts used for repairs
- The warranty shall commence only upon successful completion of the Acceptance Test or commissioning.
 - Support should be available from Monday to Friday, 8.30am to 5.30pm local time (excluding Public Holidays). Contact number/ email id should be provided.

32. Autosampler (required): Autosampler for furnace mode must have the following features:

- a. Auto sampler should be directly triggered from AAS unit via RS-232 communication having completely software controlled operation.
- b. Autosampler should have minimum 60 vial positions (2ml capacity) for samples and 8 vial positions (20 ml capacity) for reagents.
- c. Probe rinse using solvent discharge method should be provided to avoid any carryover or contamination from autosampler probe between two sample runs.
- d. Autosampler should permit random access to any vial location of samples, reagents and diluents with capability to mix sample with atleast 4 types of reagents.
- e. Autosampler should be provided with integrated cover (lid) to avoid any contamination from environmental dust.
- f. Sample injection syringe should permit for injection volume of 2-90 μ L.
- g. Autosampler should be capable of automatic standard preparation (from stock) and automatic dilution of over-range samples up to 300-fold.
- h. Minimum 60 sample vials and 8 reagent vials should be provided along with autosampler.

General Teaching Lab Equipment For Environmental Sciences			
S #	Description and Specification	Silent Features / Use / Purpose	Quantity
1	Block digester/ThermoreactorLCD	display for temperature and time, desired and actual values for heating time and temperature continually shown in the LCD display Heater: On / off display (the LED blinks red during the heating phase and is permanently on during the digestion phase), contact guard on the surface of the heating-block Holes: 12 for cell tests o 16 mm Temperature selection: 100°C, 120°C and 148°C ±1.0°C. Controlling accuracy: ±1°C ±11 digit Heating time: 8 temperature heating-time programs for simplest possible operation: 148°C (20 min or 120 min), 150°C (120 min), 120°C (30 min, 60 min or 120 min), 100°C (30 + 60 min) automatic power switch-off at the end of the heating time	3
2	Analytical digital balance	Readability 0.001g.capacity 310g.Pan size 100mm.accuracy : 3-4 significant figure Measuring time.2.5 seconds.	5
3	Deionizer plant	Treated Water Quality, Conductivity: 1 – 0.1 µS – cm Resistivity: 1 – 10 M Mohms – cm, Silica: <0.05 mg / l Residual Solids: <0.5mg/l, Liters capacity: 216 72 43 31 24 20 Max flow: 30 lit / hour, Max pressure: 10 psi / 0.7 bar Dimensions: 380 x 180 x 152 mm Country of Origin UK	5
4	Refrigerator :	Size: 14 Cft Accessories: stabilizer	4
5	Fume Cupboard	Airflow:>300m/hr,face velocity:>0.4m/sec,noise level:<52dbA,filters:1,Service required:230V 50 H single phase supply.Supply with one set of general purpose activated carbon main exhaust filters.	2

6	Distillation unit	<p>Feed water quality: Potable Tap Water Feed, Conductivity :< 2000 μS/cm at 25°C TOC:< 2000 μS/cm at 25°C < 2000 ppb Pressure :1 – 6 bar Temperature :5 – 35 °C Chlorine :< 3 ppm(*) Fouling Index :< 12 Feed water pH :4 to 10 pH units Feed Water Connection :1/2 in Gaz M Resistivity* 1 8.2 MΩ.cm at 25 °C TOC ≤ 5 ppb (μg/L) Bacteria < 0.1 cfu/mL</p>	3
7	Thermo anemometer	<p>Thermo anemometer (Hot wire-CFM) Dual line,4-digit LCD, power six AAA batteries,dimensions:2 13/16" WX 7" X 1 1/3 D, Air velocity range:40 to 3346 ft/min, resolution 1 ft/min, accuracy 3% of reading, air volume 0 to 999.990 cfm,temp.range:32 to 122 f.</p>	2
8	Vaccumr Filtration System	<p>Dimention.Height without head:130mm(5 in).Height with head:135mm(5.23 in),width:170mm(6.69 in),depth:270mm(10.6 in),weight without head:2.65kg(5.85lb),weight with head:3.60kg(7.91lb),power:24-30 Vdc,25W.Sanitization:external surface: alcohol wipe,internal flow:bleech 250ppm,paraacetic acid 0.125%,quaternary ammonium.Regulatory compliance:CE mark. pump adapters:material;stainless steel:316L,sanitization:autoclave.</p>	4
9	Circulating Waterbat	<p>Capacity: 14 liters Working dims: 219w x 298d x 150h mm Overall dims: 361w x 332d x 170h mm Heated, Watts: 1250W Pump capacity: 10-l/ min Pump pressure: 1.5 m head Voltage: 230V</p>	2
10	Magnetic stirrer/hot Plate	<p>Magnetic Stirrer/Hot Plate Power (W): 500 Max. Plate Temp °C: >450 Temp Control °C: + 5°C Stirrer Speed (rpm): 0-2000 Plate Dimensions (mm): 210 x 210 Heat Area (mm): 150x150</p>	2

11	Potentiometer	<p>pH</p> <p>Range: -2 to 19.999 pH</p> <p>Resolution: 0.001/0.01/0.1pH</p> <p>Accuracy: ±0.003</p> <p>mV mV range: ±1999mV</p> <p>Resolution: 0.1 mV</p> <p>Accuracy: ± 0.2mV</p> <p>Temperature:</p> <p>Range: -10 to +105 °C (14 to 221°F)</p> <p>Resolution: 0.1°C (1 °F)</p> <p>Accuracy: ±0.5°C (±1°F)</p>	5
12	Colony Counter	<p>Digital display 3 digit LED</p> <p>Count 0 to 999</p> <p>Dish size 50 to 90mm</p> <p>Max plate number to average 99</p> <p>Dimensions (w x d x h) 310 x 300 x 140mm</p> <p>Electrical supply 230V, 50Hz, 22W</p>	5
13	Incubator	<p>TEMPERATURE RANGE: +5°C to 99°C</p> <p>Stainless Steel Inner Chamber</p> <p>CONTROL ACCURACY: ± 0,2°C @ 37°C</p> <p>UNIFORMITY: ± 0.5°C @ 37°C</p> <p>AMBIENT @ 25°C</p> <p>Adjustable Air Vent, Thermometer Well,</p> <p>Hi-Low Fan Speed Select Switch, Microprocessor Temperature Control with Digital Temperature Indicator , Auto over / under visual / audio Alarm,</p>	5
14	Laminar air flow	<p>Cleanliness: Class 100@>0.5m</p> <p>Average with speed: 0.3-0.6m/s (Adjustable)</p> <p>Noise: <60dB(A)</p> <p>Vibration and Semi-peak value<3*m</p> <p>Illuminance>300LX</p> <p>Daylight & U.V lamp 18Wx120Wx1</p> <p>Maximum Power: 0.4kw</p> <p>Voltage: 220V 50Hz</p> <p>Specification and quantity of (HEPA) 820x600x50x1</p> <p>Size of working room LxWxH (mm): 880 x 680 x 470</p>	1
15	Soil test kit (with refill reagents)	<p>These refill reagents are required for the long term functioning of soil ph and conductivity meter kit.</p>	4

16	Refrigerated centrifuge	<p>Microprocessor controlled. speed: 18000 rpm with rotor Maximum RCF: 31,514. Fitted with timer: 1 – 99 minute or continuous. Imbalance switch off. Metal housing. Centrifuging chamber of stainless steel.</p> <p>Automatic rotor recognition. Autoclavable rotors. Lid locking and holding. Ergonomically arranged controls and displays. Entry of the parameter via foil keypad. Speed rpm: input in increments of 10. Relative centrifugal force RCF: input in increments of 10. Display of the actual values during centrifuging.</p> <p>10 programmable memories Power: 220 – 240 VAC, 50/60 Hz: Single Phase. Temperature range: -20 to +40C</p>	1
17	UV/VIS double beam spectrophotometer	<p>Double beam desing with reference and sample holders as standard. The apparatus must be able to operate as stand-alone instrument with USB memory ready to save measurement data. spectral bandwidth 1nm or smaller. Bandpass 4 nm Wavelength Range 190 to 1100 nm Accuracy ± 0.8 nm. wavelength display 0.1nm incrents. wavelength accuracy ± 0.1nm.</p> <p>Repeatability Less than 0.001Abs (at 0.5 and 1.0 Abs) Less than 0.003Abs (at 2.0Abs) Photometric Range -0.5 Abs to 3.999 Abs Transmittance range from 0% to 300T Accuracy $\pm 0.5\%$, wavelength slew rate 6000nm/min, wavele scanning speed 3000nm -10nm/min, Stray light less than 0.02% at 220nm and 340nm (NAL) Less than 1.0% at 198nm (KCI) photometri accuracy ± 0.002 Abs to (0.5Abs), ± 0.003 Abs to (1.0Abs), ± 0.006 Abs to (2.0Abs) baseline stability less than ± 0.0003 Abs/Hrs at 700nm. Baseline flatness within ± 0.0006 Abs (190-1100nm), noise level less than 0.00005 Abs RMS value. light source helogen lamp and deturium lamp (with built in light source automatic position adjustment) monochromator constructed of aberration-corrected concave blazed holographic type. detector silicone photodiode.</p>	1

Equipment Required for Botany Department Lab			
S #	Description	Specification	Quantity
1	Deionizer Plant with four cartridges	Treated Water Quality Conductivity: 1 – 0.1 μ S – cm Resistivity: 1 – 10 M Mohms - cm Silica: <0.05 mg / l Residual Solids: <0.5mg/l Liters capacity: 216 72 43 31 24 20 Max flow: 30 lit / hour Max pressure: 10 psi / 0.7 bar	3
2	Water Distillation Plant (Water still)	Water Still output 4 litres/hr, single distilled pH 5.0 – 6.5 Conductivity, μ Scm-1 3.0 – 4.0 Resistivity, mOhm-cm 0.25 – 0.3 Temperature 25 - 35°C Pyrogen content * Pyrogen free Water supply 1 litre/min 3 – 100psi (20-700kPa)	3
3	Micropipettes Adjustable	16 channel Electronic pipette, 0.5- 10 ul and • tips • Hangers • Racks 0.5-10ul , 2-20ul, 10-100ul, 5-50ul, 100-1000ul True one handed volume adjustment. • Volume lock • Easily visible, 4 digit display	4
4	Magnetic Stirrer	Power (W): 500Max. Plate Temp °C: >450 Temp Control °C: + 5°C Stirrer Speed (rpm): 0-2000 Plate Dimensions (mm): 210 x 210 Heat Area (mm): 150x150	3
5	Microscope with CCD Camera	with in-built camera connectivity in eyepiece objective 0.56X – 4.5X eyepiece WF 10 X incident light 15 W halogen Transmitted light 15W halogen	2
6	Cooling Refrigerated Incubators	Incubator with forced convection Electronically controlled APT.line™ preheating chamber technology Temperature range: -10 °C to 100 °C (14 °F - 212 °F) Benchtop: 0 °C - 100 °C (32 °F- 212 °F) alarm, Inner glass door	3

7	Fume Hood	Vertical laminar flow clean benches Air Volume (Minimum / Maximum) 0 to 1020 cmh / 0 to 600 cfm Laminar Airflow Velocity (m / s / fpm) 0.3 / 59 Air Cleanliness within Work space: ISO 14644-1 Class 4, US Federal Standard 209E Class 10 HEPA Filter, Pre Filter Main Body Steel powder coating. Work Surface Stainless steel grade 304, Hairline treatment Windows (Front / Side) Colorless and transparent UV absorbing 5mm tempered glass, Illumination , Intensity (lux) > 650 Fluorescent lamp (W) 2Wx2ea. Electronically ballasted Fluorescent Lamp, UV lamp (W) 30Wx1ea / 25Wx2ea, electronically ballasted UV Lamp, Electric Socket Outlets 230V socket	2
8	Vertical Laminar flow	cabinet Airstream vertical laminar flow cabinet4ft Parameters/Specifications Inner Dimension 52.7 X 28.8 X 55.1 WDXH Working Place Stain less stelll holed plan Material outer Powder coated steel Filter system Two HEPA filter Filter efficiency More then 90% / 0.3 micron Pre filter 3.3µoartucke renivak recyclable	2
9	Micro centrifuge	Speed: 6000rpm RCF: 4025xg Capacity: 6 x 15/50ml with extra rotor	4
10	Refrigerator & Freezer	Minus 30 refrigerator Freezer Upright -30°C CFC Free, Compact, easy-to-use vertical design, At ambient Temperature of 35°C, Microprocessor Temperature control with digital display, Removable Freezer containers provided. -Exterior Dimensions: 612 x 755 x 1617 mm. -Interior Dimensions: 490 x 485 x 1290 mm door lock keys	4
11	Refrigerator	Freezer upright CFC Free, Compact, easy-to-use vertical design, At ambient Temperature of 35°C, 4°C -Exterior Dimensions: 612 x 755 x 1617 mm. -Interior Dimensions: 490 x 485 x 1290 mm	3
12	Temp. & Humid. Chambers	Plant Growth Chambers/ Light bank With controlled and programmable temperature, humidity and light. Chamber Volume (L / cu ft): 1000 / 35.3 Control System Microprocessor PID controller Temperature:Range (C/ f), 5 to 50 / 41 to 122 - Lamp off ,10 to 50 / 50 to 122 - Lamp on, 20 to 50 / 68 to 122 - with humidity Fluctuation, Sensor NDIR CO2 sensor ,Wire Shelves, Perforated	2

		Shelves Recorder , CO 2 Sensor, Connecting tube.	
13	Water Distillation Machine	Output 4 litres/hr, single distilled, pH 5.0 – 6.5, Conductivity, μScm^{-1} 3.0 – 4.0, Resistivity, $\text{m}\Omega\text{-cm}$ 0.25 – 0.3, Temperature 25 – 35°C Pyrogen content * Pyrogen free, Water supply 1 litre/min ³ – 100psi, (20-700kPa), Electricity supply 220 or 240V, 50-60Hz, single phase,	4
14	Autoclave digital	Autoclave Digital Microprocessor Controlled Vertical Unit, Temperature Range 105 to 135° C Interior Chamber Stainless, steel, capacity 50 Lit interior chamber dimension 300x710	3
15	Laminar Flow Hood	Laminar flow hoods protect the working environment from dust and other air born contaminants by maintaining a constant, unidirectional flow of HEPA-filtered air over the work area. Use in Plant Physiology Lab, Plant Biochemistry, Molecular Biology Lab,, Microbiology Lab.	3
16	Fluorescent Microscopy	Magnification Range 40x - 1000x Microscope Body Sturdy, 270 x 250 mm base with supportive rubber feet Nosepiece Quadruple, forward-turned mechanism with multiple ball bearings, elastic nosepiece grip ring Quadruple, reverse-angle mechanism with multiple ball bearing, elastic nosepiece grip-ring Head Binocular Arctype Siedentopf Head, 30° inclined, 360° rotatable, interpupillary distance 48 - 75 mm, provided with Anti-Fungus Treatment Stage Double layer specimen stage (160 x 140 mm) with exchangeable, ultrahardened, flexible glass plate with rounded edges for safe handling. Surface is coated and resistant against chemical fluids and scratches (Art.No. 900821). With right-handed mechanical stage	1

Equipment List for Bio-Technology Department			
S.No.	Name of Equipments	Specification Biotechnology	Quantity
1	Autoclave	Autoclave Digital Microprocessor Controlled Vertical Unit, Temperature Range 105 to 135° C Interior Chamber Stainless, steel, capacity 320 Lit interior chamber dimension 300x710	1
2	Refrigerated Centrifuge	Max Speed: 15000rpm, Max RCF: 21382xg, Max capacity: 4 x 100ml, Temperature range: -20 to +40C, Timer: 1-99min or continuous, Short cycle: impulse key for short cycleAngle Rotors: Capacity: 8 X 50ml Falcon tubes, 32 x 15ml falcon tubes, speed: 4500rpm,RCF: 3283xgAngle Rotor: Capacity: 24 x 1.5ml, speed: 15000rpm, RCF: 21382xgFalcon Tubes: 16 NosTubes: 30 Nos (1.5/2.0ml) appendages	5
3	Micro centrifuge	Microprocessor controlled. Maximum speed: 18000 rpm without rotor. Maximum RCF: 31514. Fitted with timer: 1-99 min. Imbalance switch off. Metal housing. Chamber of stainless steel. Speed rpm: input in increments of 10. Power: 220 -240 VAC, 50/60 Hz: single phase. Temperature range:-20 to+40 C, with appendages	5
4	Shaking baths	Bath Volume: (L / cu ft)55 / 1.9, Working Temperature Range:Amb. +5 to 100 / Amb. +9 to 212. Temperature Stability: 0.2 / 0.36, Shaking system Speed Range (RPM): 20 to 180; Stainless Steel, all accessories	4
5	Refrigerator & Freezer	Minus80 refrigerator Freezer Upright; Temperature range -20 to -86°C CFC Free, Compact, easy-to-use vertical design, ambient Temperature , Microprocessor Temperature control with digital display, Removable containers provided. door lock keys, compatible stabilizer and temperature monitoring ystem/device	4 (01 unit:minus 80°C) (03units:minus 80°C)
6	pH Meter Bench Top	pH Range: -2.00 to 16.00 pH Resolution: 0.01pH Accuracy: ± 0.2pHmV Range: ±1999mV Accuracy: ± 1 mV Input all buffers for calibrations (min 3 buffers)	5

7	Vertical Laminar flow cabinet	Airstream vertical laminar flow cabinet 4ft Parameters/Specifications Inner Dimension 52.7 X 28.8 X 55.1 WDXH Working Place Stain less stelll holed plan Material outer Powder coated steel Filter system Two HEPA filter Filter efficiency More then 90% / 0.3 micron Pre filter 3.3µoartucke renivak recyclable	1
8	Thermal Cycler	Real Time Multi-color Quantitative PCR instrument with all accessories including computer & Software Technical Specification Block format: 96 x 0.2ml well, Thermal cycler block uniformity: Better than ± 0.25°C Thermal cycler maximum ramp rate: 2.6°C/Sce, Thermal cycler temp rage: 4°C – 99°C, Sample volume: 15 – 50µl, Heated lid: Adjustable between 10°C above ambient to 110°C, Connectability: Connect up to 4 Quantica to one computer (1), Thermal gradient: Maximum gradient 30°C. Available as an option, Plate format: Low profile 96 well plate,	1
9	Micro pipettes	0.5-10ul , 2-20ul, 10-100ul, 5-50ul, 100-1000ul volume lock, volume adjustment, sterile tips for above mentioned pipettes, racks for tips with 3 additional sets, micropipette holders with 3 additional set	5
10	Hot Plate Magnetic Stirrer	Power (W): 500 Max. Plate Temp °C: >450 Temp Control °C: + 5°C Stirrer Speed (rpm): 0-2,500 Plate Dimensions (mm): 210 x 210 Heat Area (mm): 150x150 Magnetic stirrer bar (all size range: 3sets) Impeller Plastic retrievers (additional 3sets) Plate cover	5
11	Top loading Balance	Readability: 0.001g Capacity: 310g Pan Size: Ø100mm	5 (variable weight range)
12	Gel Electrophoresis	horizontal system + 20x10 & 20x20 cm gel Electrophoresis Unit (2) Gel Caster Unit Combs [9teeth small (1); 14 teeth medium(2); 28 teeth large(1)] Electrode assembly, electric supply, 3 gel caster units	3

13	Stereo microscope with digital camera	<p>Ground plate with filter magazine No : 11888100 Daylight filter, 32mm No : 11504046o : 11888187 Tube Optic P 1x/1.6X+Bertrandl.+Quarzpl. No : 11888503 Basic Docu Tube POL BDTP 25 No : 11551076 Tube adapter incl. 1 docu. Port No : 11505161 Eyepiece HC PLAN s 10x/25 Br.M +reticule No : 11557806 Eyepiece HC PLAN s 10x/25 Br. M No : 11507808 Pol-Stage w. 45°-click stop to o : 11551077 Advanced Object guide for Pol-Stages No : 11553520 Condenser BF No : 11505141 Condenser head P 0.90 S1 No : 1155107255077 Analyzer360°, 30x5 without grey Eyepiece HC PLAN s 10x/25 Br. M No : 11507808 Pol-Stage w. 45°-click stop to o : 11551077 Advanced Object guide for Pol-Stages No : 11553520 Condenser BF No : 11505141 Condenser head P 0.90 S1 No : 1155107255077 Analyzer360°, 30x5 without grey filter No : 11555080 Whole-wave plate f. compensator slot No : 11553388 Halogen lamp 12V 100W (Osram 64625) No : 11500974 Lamp housing 106, 12V 100W, 2-lens,0.55m 1 536.80 536.80 No : 11504058 Cube P to Smith, fixed No : 11555081 Polarizer R/P, L 29x11.5 Halogen lamp 12V 100W (3) Lamp housing 106, 12V 100W, 2-lens,0.55m No : 11504058 occulomicrometer & pointer Digital Camera & system</p>	5
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