

# Shaheed Benazir Bhutto University



## TENDER DOCUMENTS

For

**The Purchase/Supply of Main Item: Lab Equipments for Central Lab & Geology, Chemistry, Zoology, Botany, Pharmacy, Animal Sciences, Biotechnology, Agriculture, Environmental Sciences Departments under the Project/PC-1 (1.709 B) Development of University of Dir, Sheringal, Dir Upper.**

**SHAHEED BENAZIR BHUTTO UNIVERSITY,  
MAIN CAMPUS SHERINGAL, DIR UPPER**



**SHAHEED BENAZIR BHUTTO UNIVERSITY**  
**Sheringal, Dir Upper, Khyber Pakhtoonkhwa**  
**Advertisement No. SBBU/Adv./Td/85-2017**

**TENDER NOTICE**

**(Lab Equipments)**

Sealed Tenders are invited from the well established/reputed Firms/Companies/Suppliers, registered with Income Tax/Sales Tax Departments for the supply of Main Item: Lab Equipments for Central Lab & Geology, Chemistry, Zoology, Botany, Pharmacy, Animal Sciences, Biotechnology, Agriculture, Environmental Sciences Departments under the Project/PC-1 (1.7 B) Development of University of Dir, Sheringal, Dir Upper.

**TERMS & CONDITIONS:**

1. The detailed BOQ/Specifications along with the terms and conditions have been set forth in the tender documents.
2. Tender documents can be obtained from the office of the Deputy Director (Procurement) w.e.f. **22-08-2017 till 12-09-2017 (10:30 A.M.)** during office hours, on payment of non-refundable fee of **Rs. 2000/-** per tender. The documents may also be downloaded from the web site of the university [www.sbbu.edu.pk](http://www.sbbu.edu.pk) OR **PPRA Web Site "info@ppra.org.pk"**. In case of downloading the documents, the fee can be sent through bank draft from any HBL branch (ONLY), in favor of the Treasurer, Shaheed BB University, Sheringal.
3. Tenders shall be opened on **12.09.2017 at 11.00 A.M.**, (30 minutes after closing time) in the presence (not obligatory) of the interested companies/suppliers or their authorized agents in the office of the Convener, Purchase Committee of the University.
4. Only the manufacturers/firms/companies or its authorized distributors will be eligible to apply.
5. The quotations must be accompanied with a call deposit of 2% from schedule bank of the quoted amount/cost.
6. The suppliers/firms/manufacturers will not be allowed to sublet the work/contract/supply to another supplier/firm/manufacturer.
7. The University shall upon request, communicate the bidder the grounds of rejection, but it is not required to Justify those grounds.
8. Errors and omissions, if any, shall subject to rectification by the University.

**Convener Purchase Committee**

**Shaheed Benazir Bhutto University, Sheringal, Dir Upper**

**Ph. No. 0944-885405/0302-8395028, Fax. 0944-885805, Email: [dayan@sbbu.edu.pk](mailto:dayan@sbbu.edu.pk)**

# **TENDER DOCUMENT**

**The Supply of Main Item:** Lab Equipments for Central Lab & Geology, Chemistry, Zoology, Botany, Pharmacy, Animal Sciences, Biotechnology, Agriculture, Environmental Sciences Departments under the Project/PC-1 (1.709 B) Development of University of Dir, Sheringal, Dir Upper.

**The proposals will be opened on 12-09-2017 at 11:00 A.M. sharp in the Office of Convener Purchase Committee in the presence of the Purchase Committee under the chairmanship of the Convener Purchase Committee, Shaheed Benazir Bhutto University, Sheringal, Dir Upper.**

**Name of the Company / Dealer:**

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**Address of the Correspondent:**

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Date: \_\_\_\_\_

Signature and Seal

Telephone No: \_\_\_\_\_

Fax No: \_\_\_\_\_

E mail: \_\_\_\_\_

**Rs. 2000/- only**

## Terms & Conditions of the Tender

### Note:

- a. Tenderers should read these conditions carefully and comply strictly while sending their tenders.
- b. If any discrepancy, error, or omission found in the tender documents; please contact Deputy Director Procurement on or before the closing date for Tenders.
- c. Purchase Committee shall upon request, communicate the bidder the grounds of rejection, but it is not necessary to justify those grounds. The decision of the Purchase Committee shall be final.

### 1. General

- All Quotations should reach the undersigned within due date as specified in the advertisement only through registered post/Courier.
- **The soft copy of quotations on a CD/Email must be provided along with Hard copy.**
- Any cutting/ correction in bid will make quotation invalid.
- In case of quoting alternate prices, separate tender shall be purchased.
- Tenders forms shall be filled in ink or typed. No tender filled in pencil shall be considered.
- The bidder shall sign and stamp each page of the Technical and Financial Proposal.
- Rates shall be written both in words and figures. There should not be errors and / or over-writings. Corrections if any should be made clearly and initiated with dates.
- Quotations must be valid for **03 months**.
- Only Manufacturers / distributors / bona fide dealers of the goods shall give tenders. They shall, therefore, furnish necessary declaration along with documentary proofs for the same.
- Any bidder, interested in bidding for one or more items separately, is allowed to do so. However, preference will be given to bidder offering several items together.
- Supply order/ contract award will be issued to the successful bidders.
  
- **The single-stage –Single envelope procedure as per PPRA Rules, Govt. of Pakistan will be adopted. The interested parties should submit the bid(s) in a single package containing single envelope marked as Financial Proposal along with Technical (if any).**
- The contractor shall notify in written form to the purchase committee with any change in the constitution of the firm, etc. and such change shall not relieve any former member of the firm, etc., from any liability under the contract.
- The contractor, in respect of the contract, shall accept no new partner/ partners in the firm unless he / they agree to abide by all its terms, conditions and deposits with the purchase committee a written

agreement to this affect. The contractor's receipt for acknowledgement or that of any partners subsequently accepted as above shall bind all of them.

- The contractor shall not assign or sub-let his contract or any substantial part thereof to any other agency.
- The purchase committee reserves the right to accept any tender not necessarily the lowest, reject any tender without assigning any reasons and accept tender for all or anyone or more of the articles for which tender has been given or distribute items of stores to more than one firm/ supplier.
- The tender shall remove the rejected articles within 15 days of intimation of rejection, after which purchase committee shall not be responsible for any loss, shortage or damage and shall have the right to dispose of such articles as it thinks fit, at the tenderer's risk and cost.

## **2 Scope of supply**

- The firm shall enter into a contract with Shaheed Benazir Bhutto University, regarding the repairs and maintenance of the Item / equipment(s) supplied and will be responsible for the arrangements of spare parts whenever needed.
- Although, specifications and accessories have been provided, yet the University will not accept any excuse for any missing part / item needed for its full working condition.
- The tenderer, whose tender is accepted, shall arrange to supply as per schedule to be provided by the university in supply order.

## **3. BID price**

- The Bidder shall indicate in his offer, list of items with specifications, standard accessories, make and origin, the unit price and total Bid prices of the goods.
- Prices of the optional accessories should be quoted separately. Rates quoted should be on the basis of F.O.R, Shaheed Benazir Bhutto University, Main Campus Sheringal as mentioned in the B.O.Q.
- Taxes levied by the government, if any, shall be paid by the bidder and must be included in the quoted prices.
- Security @ 10% of the total bill will be deducted for a period of One Year and will be released subject to receiving satisfactory report from the concerned office/end user (3 months for Stationary items & exemption for consumables).
- Sales Tax and Income Tax & other applicable Taxes/Levies will be deducted from the supplier's bill as per government rules.

## **4. Currencies of BID**

- The prices shall be quoted in Pakistani rupees on F.O.R basis,

## **5, BID validity**

- The Bid shall remain valid and open for acceptance of the purchaser for a period **Three months** from the specified date of opening.

#### **6. Earnest Money/Call Deposit**

- The Quotation must be accompanied with a call deposit of 2% of the local quoted prices with their offer in the form of Bank CDR/Demand Draft/Pay order in favor, of the Treasurer Shaheed Benazir Bhutto University, Sheringal (refundable).
- The earnest money shall be denominated in Pakistani rupees and shall be in the form of demand draft, pay order or call deposit, issued by Pakistani bank or branch of a foreign bank, operating in Pakistan.
- In case of alternate prices, earnest money will be based on the maximum quoted price of the same items. The Demand Draft/CDR shall be returned to unsuccessful bidders on written request & to successful bidders on provision of 10% performance bond security.
- The earnest money may be forfeited in the following cases:
  - i. When Tenderer withdraws or modifies the offer, after opening of tender but before acceptance of tender,
  - ii. When Tenderer does not execute the agreement if any, prescribed within the specified time.
  - iii. When the Tenderer does not deposit the security money after supply order is given & accepted.
  - iv. When he fails to commence the supply of the items as per supply order within the time prescribed.

#### **7. Signing of BIDS**

- The person signing the Bids shall initial/sign all the pages of the bid along with official seal/stamp where entries are made.

#### **8. Dead Line for submission of Bids**

- All Bids must reach and be received by the purchaser on or before the prescribed date line during the office hours.

#### **9. Late BIDS**

- Late bids will not be entertained and returned unopened to the Bidders.

#### **10. Canvassing**

- Counseling or canvassing staff or elected representatives by any Tenderer will become liable to disqualification.

#### **11. Delivery of Equipment / Items**

The tenderer, whose tender is accepted, shall arrange to supply as per schedule to be provided by the university in supply order (02 month for local items & 04 months for imported items).

- The items/ equipment (s) will be supplied in packed form and opened in front of the Purchase Committee. The working manuals, circuit diagrams, related literature and computer programs, if any, must accompany the items/ equipment(s) in original.
- The tenderer shall be responsible for the proper packing, so as to avoid damage under normal conditions of transport by sea, rail and road or air and delivery of the material in the good condition to the consignee at destination.
- In the event of any loss, damage, breakage or leakage or any shortage the tenderer shall be liable to make good such loss and shortage found at the checking / inspection of the material by the consignee. No extra cost on such account shall be admissible.
- The goods will be delivered at the destination godown in perfect condition.
- The supplier, if he so desires may insure the valuable goods against lost by theft, destruction or damage, by fire, flood under exposure to whether or otherwise viz., (war, rebellion, riot, etc.,).
- The insurance charges will be borne by the supplier and tendering committee will not be required to pay such charges if incurred.

#### **12. Performance Security**

- Within **15 days** of issuance of the purchase/supply order successful bidders shall furnish to Shaheed Benazir Bhutto University, Sheringal Dir Upper the performance security bond equivalent to 10% of the supply order amount in the form of DD/CDR/PO/Bank Guarantee from any bank, the performance security shall be payable to Shaheed Benazir Bhutto University as compensation for any loss resulting from the suppliers failure to complete its obligations.
- The performance security will be discharged by the University and returned to the supplier after completion of the supplier's performance obligations under the contract.

#### **13. Forfeiture of Security Deposit**

- Security amount in full or part may be forfeited in the following cases:
  - i. When the terms and conditions of contract is breached.
  - ii. When the Tenderer fails to make complete supply satisfactorily.
  - iii. Notice of reasonable time will be given in case of forfeiture of security deposit. The decision of the Purchase Committee in this regard shall be final.

#### **14. Mode of Payment**

- Payment shall be made in the form of cheque which shall be issued after receipt of equipment / items, installation and inspection, according to the following schedule.
  - i. 90% payment will be made only after the equipment(s) is fully installed and comes in working condition.
  - ii. 10% as per schedule mentioned in Bid Price conditions from the date of commissioning/supply.

- No advance payment will be made. Payments will be made subject to the clearance of account and audit cells.
- The time specified for delivery in the tender form shall be deemed to be the essence of the contract and the successful tenderer shall arrange supplies within the specified period.
- If the supplier requires an extension of time in completion of contractual supply on account of occurrence of any hindrance, he shall apply in writing to the committee, which has placed the supply order, for the same immediately on occurrence of the hindrance but not after the stipulated date of completion of supply.

**15. Prices**

- Prices charged by the supplier for goods delivered & services performed under the contract shall not exceed the prices quoted by the supplier in its bids. The quantity of items to be purchased can be increased / decreased at the quoted/approved rates.
- The Purchase Committee reserves the right to consider a total package deal for all or group of some equipment with a total lowest quoted price for the package rather than lowest prices for the individual items.

**16. Standard**

- The equipment supplied must be tropicalized and it must be capable of functioning under the climatic conditions of Sheringal, Dir Upper.
- There shall be no deviation from specification and country of make as provided with each item. In case of any ambiguity in specification/accessories needed for the full functioning of the equipment, the firm must clear it with the Purchase Committee. However, the decision of the Purchase Committee will be final.
- The goods with standard accessories supplied under this contract shall conform to the standard maintenance in the technical specification along with the set of operational and maintenance manual it will be responsibility of the supplier to quote equipment in complete package.

**17. Training**

- The firm supplying the item/ equipment(s) will demonstrate the operation / working of the equipment(s) to the satisfaction of the quarter concerned and provide training if needed.

**18. Calibration of item/equipment**

- The approved firm will install the equipment(s) in the presence and to the satisfaction of the Purchase Committee. In case of any defect in the supplied equipment(s) or if it is not in accordance with the desired specification, the item will be changed at the cost of the supplier.

**19. Guarantee / Warranty**

The tenderer would give comprehensive onsite warranty / guarantee that the goods / stores / articles would continue to conform to the description and quality as specified for a period of **one year** (**exemption** for consumables) from the date of delivery of the said goods/stores/articles to



be purchased and that notwithstanding the fact that the purchaser may have inspected and/or approved the said goods/stores/article, if during the aforesaid period of one year, the said goods/stores/articles, be discovered not to conform to the description and quality aforesaid or have determined (and the decision of the Purchase Committee in that behalf will be final and conclusive), the purchaser will be entitled to reject the said goods/stores/articles or such portion thereof as may be discovered not to conform to the said description and quality, on such rejection the goods/articles/stores will be at the seller's risk and all the provisions relating to rejection of goods etc. shall apply.

- The tenderer shall, if so called upon to do, replace the goods etc., or such portion thereof as is rejection by Purchase Committee, otherwise the tenderer shall pay such damage as may arise by the reason of the breach of the condition herein contained. Nothing herein contained shall prejudice any other right of the Purchase Committee in that behalf under this contract or otherwise.
- The tenderer shall also replace machinery and equipments, in case it is found defective which cannot be put to operation due to manufacturing defect, etc. In case of machinery and equipment specified by the purchase Committee, the tenderer shall be responsible from carrying out annual maintenance and repairs on the terms and conditions as may be agreed. The tenderer shall also be responsible to ensure adequate regular supply of spare parts needed for a specific type of machinery and equipments whether under their annual maintenance and repairs rate contract or otherwise. In case of change of model he will give sufficient notice to the Purchase Committee who may like to purchase spare parts from them to maintain the machinery and equipments in perfect condition.
- The firm must have a representative office in Peshawar/Islamabad/Lahore, which can be contacted in case of any problem encountered during the working of equipment(s).

## **20. Conforming Tender**

- A conforming tender is defined as follows:
  - i. It is submitted on time.
  - ii. It is lodged at the nominated place.
  - iii. All required forms are completed.
  - iv. Documents are properly signed.
  - v. It complies with the tender conditions.
  - vi. There are no commercial and contractual qualifications to the tender.
- A non-conforming tender is one, which does not satisfy the above requirements and it may be rejected.

**21. Disqualification of Tender**

- The tenderer shall observe all relevant statutory and legal requirements when complete the tender. Any Tenderer engaged in collusion with other tenderers shall be disqualified from tendering.

**22. Delivery Schedule**

- For Local items Delivery Schedule should be **Two (2) months** from the signing of Contract within 15 days after issuance of Supply Order.
- For Imported items Delivery Schedule should be **Four (4) months** from the signing of Contract within 15 days after issuance of Supply Order.
- Keeping in view the actual problems/delays in delivering the respective items, Delivery Schedule can be relaxed with the approval of the Competent Authority.

**23. Delay in Delivery**

- In case of delay in the delivery, the recovery shall be made on the basis of following percentages of value of goods stores / work completion which the tenderer has failed to supply / complete the work.

**Conditions with Percentage**

- a. Delay up to one fourth period of the prescribed delivery period.

**2.5 %**

- b. Delay exceeding one fourth but not exceeding half of the prescribed period.

**5.0 %**

- c. Delay exceeding half but not exceeding three fourth of the prescribed period.

**7.5 %**

- d. delay exceeding three fourth of the prescribed period.

**10.0 %**

- Fraction of a day in reckoning period in supplies shall be eliminated if it is less than half a day. The maximum amount shall be 10%.
- The 10% Security money shall be refunded immediately after expiry of warranty period provided there is no breach of contract by the supplier and provided there is no outstanding against the tenderer.

**24. Recoveries**

Recoveries of liquidated damages, short supply, breakage, rejected articles shall ordinarily be made from bills.

**Contract Agreement**

This agreement is made this day date-month-2017 between the **SHAHEED BENAZIR BHUTTO UNIVERSITY SHERINGAL, DIR UPPER, KHYBER PAKHTUNKHWA** (hereinafter called as Party One which shall include the successors and assignees in the Board/Centre) and the Tenderer/Contractor, M/S XYZ (hereinafter called as Party Two which includes its successors and assignees)

Whereas the Party One having invited tender, **SHAHEED BENAZIR BHUTTO UNIVERSITY SHERINGAL, DIR UPPER, KHYBER PAKHTUNKHWA** decided to accept the tender of **M/S XYZ**

The detail of items is as under for the supply of (quoted item in tender)

**SUPPLY ORDER FOR THE PURCHASE OF XXXXXXXX, TENDER # 00/2016, S.O NO # SBBU/Proc/000 DATED 00-00-2016,** amounting to Rs-**000,000/- Rupees**

Now this deed witnessed as follows:

- (a) The SBBU Dir Upper hereby appoints M/S XYZ for the work/items mentioned in **S.O NO # SBBU/Proc/000 DATED 00-00-2016, TENDER # 00/2016,** & SBBU agrees to pay the amount mentioned in **S.O NO # SBBU/Proc/000 DATED 00-00-2016, TENDER # 00/2016**
1. The work/items will be supplied to **SHAHEED BENAZIR BHUTTO UNIVERSITY SHERINGAL, DIR UPPER, KHYBER PAKHTUNKHWA** as per specifications mentioned in the supply order and tender documents as well as warranty.
  2. Delivery of work/items and relevant bill(s) to **SHAHEED BENAZIR BHUTTO UNIVERSITY SHERINGAL, DIR UPPER, KHYBER PAKHTUNKHWA** will be completed within the specified period from the date of contract as per supply order conditions.
  3. All the items will be delivered at **SHAHEED BENAZIR BHUTTO UNIVERSITY SHERINGAL, DIR UPPER, KHYBER PAKHTUNKHWA** at the cost of the firm/supplier.
  4. The function and operation of the equipments/items will be demonstrated at **SHAHEED BENAZIR BHUTTO UNIVERSITY SHERINGAL, DIR UPPER, KHYBER PAKHTUNKHWA** by the firm/supplier.
  5. Sub-standard or not according to specification, the items will be rejected and returned on the expenses of the firm/supplier.
  6. A performance bond @ 10% (Rs-00,000) of the bid amount in the shape of bank draft/call deposit/D.D./Bank or Insurance Guarantee will be submitted to **Treasurer Shaheed Benazir Bhutto University Sheringal, Dir Upper** at the time of contract. The performance bond security will be returned after completion of supply order.
  7. Failure in supply of items within stipulated period shall entail forfeiture of earnest money & performance bond.
  8. The Party Two agrees for completion of the job according to the designs and samples approved by the SBBU within specified period from the date of contract. In case of delay, the SBBU reserves the right to impose a penalty up to 10% of the total amount of the contract as per tender terms & conditions.

Signature: \_\_\_\_\_

Name: M/S XYZ

Seal of the firms: \_\_\_\_\_

Convener Purchase Committee

SBBU Sheringal, Dir Upper

Witness # 1

Witness # 2

**List of Lab Equipments for Department of Geology from Main PC-1 (1.709 B) 3<sup>rd</sup> Time Retender**

S.#	Name of Item	Specification	Quantity
1	PROCTOR HAMMER MANUAL	Standard Soil Compaction Hammer with drop height 12in (305mm). Enclosed in a guide sleeve with vent holes to insure unrestricted free-fall.  Manual Modified Soil Compaction Hammer. Enclosed in a guide sleeve with vent holes to insure unrestricted free-fall. Drop height is 18in (457mm).	<b>One + One each</b>
2	WEIGHT SET	<b>WEIGHT SET</b> Set of slotted steel weights tot.37.5kg: 2x0.250kg; 2x0.500kg; 2x1kg; 3x2kg; 3x4kg; 2x8kg	<b>1</b>
3	STANDARD PENETRATION TEST APPARATUS	SPT split sampler stainless steel , spt hammer of 140 lbf, spt guide rod assembly, spt lifting hook assembly, spt drilling rod 42mm x 5 feet approximately. with coupling nipple (6), spt tripod set 2" dia (15 ft approximately), manila rope (rate per foot) (50), screw wrench 18" Local made standard quality/equivalent	<b>1</b>
4	CAPPING MACHINE	The combination 4" / 6" Vertical Combo Capping Fixture makes capping cylinders easy. Heavy, 1" thick base provides a solid foundation for application of melted capping compound to cylinder. Base is surface ground plane to within .002". Comes complete with heavy duty 1" thick base, two posts, 4 donuts, 6" and 4" diameter capping ring. Meets or exceeds ASTM, C-31, C-39, C-192, C-617, AASHTO T-22, T-23, T-126, T-231.	<b>1</b>
5	SOUNDING SET Complete set	Sulfate Soundness 8" Sieve Holder Sulfate Soundness Solution Bucket-8" Sieves, Sulfate Soundness Washing Tank, Sodium Sulfate Soundness Hydrometer, Magnesium Sulfate Soundness Hydrometer-8in, Full-Height Stainless Steel Blank Sieve Frame,	<b>1</b>
6	ROCK CORE DRILLING MACHINE Universal (With full optional accessories)	Universal drilling frame complete( <b>both for rocks and concrete coring</b> ) <b>Coring machine</b> used in the laboratory, to obtain cores from irregular rock samples. To be used with the Core Drilling Barrels (accessory). The 2 speed electric motor 1140/2040 rpm at free load and 730/1340 rpm at max load, is equipped with friction device and double safe isolation to CE Directive. Complete with specimen's clamp device, water cooling system and water tank. Power supply: 230 V 50/60 Hz 1ph 1800W Weight: 60 kg approx. Strap Wrench useful for unblocking, any type of Bit Must contain the following Core sizes. <b>Description dia mm D.C.D.M.A. Reference</b> Diamond core bit for 21.46 mm EX Diamond core bit for 30.10 mm AX Diamond core bit for 38.10 mm 1.5 inch Diamond core bit for 42.04 mm BX Diamond core bit for 54.74 mm NX (Needs 2 bits) Diamond core bit for 63.5 mm HQ Diamond core bit for 50mm (Needs 2 bits) Diamond core bit for 100mm Italy/ equivalent	<b>1</b>
7	Rock Chisel Local/Equivalent	Rock Chisel, 1.25 "W x 8" L, is top quality for digging, splitting, prying. Made from one piece forged steel. Handle has nylon-vinyl grip.	<b>4</b>
8	MIXING TRY FOR SAND AND AGGREGATE (one each size) local made /equivalent	GALVANIZED SAMPLING TRAY (12"X12"X2"), GALVANIZED SAMPLING TRAY (18"X18"X3"), GALVANIZED SAMPLING TRAY (24"X18"X3"), GALVANIZED SAMPLING TRAY (36"X24"X3"), CYLINDER MOULD FOR CONCRETE 6" DIA x 12" HEIGHT	<b>One each</b>
9	ASTM	The ASTM #1C General Lab-Thermometer, -20 to 150C x 1.0 div. accuracy is assured by inspection and testing of samples from each production run. The thermometer must be compatible with a statement of compliance to E 1 and E 77 requirements.	<b>1</b>

	GENERAL LABTHERMOMETER		
10	UTM Universal testing machine	<p><b>Compression Machine ASTM D2664, ISRM, UNI 9724-8, ASTM D5407, ASTM D2938, ASTM 3148</b></p> <p><b>Descriptions:</b>• The triaxial test is made on a rock specimen placed into a container (Hoek Cell), closed into a latex membrane. The specimen receives an axial load and a constant isotropic pressure normally between 5 and 6 Mpa for the whole test. The electric extensometers are directly applied on the surface of the rock specimen and they are used for the automatic reading in real time of the different parameters and find different information as: • Radial deformation combined with the axial deformation to obtain the Poisson value. • Stress value in relation with the axial and radial deformation.</p> <ul style="list-style-type: none"> <li>• The maximum or breaking value. • Tangent and secant Young’s modulus measured on the axial deformation curve. • Maximum stress value in triaxial conditions.</li> <li>• The standards require that during the compression test the load on the rock specimen is applied in a continue way in order to obtain the breaking of the specimen within a time included between 5 and 10 minutes, with a constant increase of the load included between 0.5 and 1.0 Mpa/second. • For this reason it is recommended the use of a compression load frame with capacity of 1500, 2000 or 3000 kN (higher capacity machine can also be used) combined with the automatic servo controlled system “Servo-Plus Evolution” and to the automatic system for the Elastic Modulus on rocks, that includes the data acquisition and processing software.</li> <li>• The side pressure set by the user is kept constant between <math>\pm 1\%</math> using: Automatic servo controlled system “Servo-Plus Evolution” that grants a setting of the pressure up to 70/80 Mpa.</li> </ul> <p><b><u>ACCESSORIES</u></b> Must contain the following accessories.</p> <ol style="list-style-type: none"> <li>1- Flexure testing set for centre and third point test on concrete and rocks beams.</li> <li>2- Electronic universal extensometer/compressometer for cylinders, prisms and cubes. Supplied with short distance piece for use with prisms 40x40x160 mm, adjusting template and 2 elastic bands</li> <li>3- Hoek Triaxial Cell BX, 42,04 mm dia. Hoek Triaxial Cell NX, 54,74 mm dia. Hoek Triaxial Cell HQ, 63,5 mm dia.</li> <li>4- Automatic pressure maintainer Software for data acquisition, processing, management</li> </ol>	1
11	Color Image Scanner	Auto Scan mode automatically adjusts settings. Detects what is scanning for improved imaging effortlessly. Supports optical resolutions up to 4800 dpi, High-speed color scanning. Must Scan a letter-size image in about 10 seconds. USB cable power supplier. Great for scanning books and other bound materials. Auto Document Fix for better results. Canon /HP or equalent	1
12	Automatic thin section polisher Local/equivalent	Dual wheel units(300mm wheel size) Specimen holder/mover that can hold at least six thin sections at a time of 1inchx 3inch size. A complete set of grinding papers Compressor Variable speed of 50-100rpm	1
13	GPS (Global Positioning System) Map Based	Physical and Technical Dimensions (W x H x D): 6.1 x 16 x 3.6 cm Display Size (W x H): 3.6 x 5.5 cm Display Resolution (W x H): 160 x 240 pixels Display Type: transfective, Battery: 2 AA batteries Battery Life: 20 hours, typical Waterproof: Yes High-sensitivity Receiver: Yes Interface: high-speed USB and NMEA compatible Operating Temperature: -15°C to 70°C Maps and Memory Basemap: Yes Ability to Add Maps: Yes	2

		Built-in Memory: 2 GB Accepts Data Cards: microSD card Waypoints/favourites/locations: 2000 Routes: 200 Track Log: 10,000 points, 200 saved tracks	
14	Brunton compass (japan)/Equivalent	Adjustable needle locking mechanism Hinge clinometers with 1° increments for 1/2° readable dip measurements Two long-level bubbles on the outside of the aluminum housing for no guess leveling from the side or the bottom Cover hinge assembly designed for increased durability "Buck Horn" style sights for increased accuracy when sighting azimuth or vertical angles Single NdFeB magnet resists demagnetization better than any other type of magnet Percent grade scale with increments of 5% Induction damped needle for quick, accurate readings Sapphire jewel bearing allows for smooth needle movement Magnetic declination adjustment allows for east or west declination setting to +/- 180° Precision aligned mirror with convenient "see through" sighting capability 6061 -T6 hard anodized aluminum body for permanent color and scratch resistance Ball and Socket tripod mount is centered for increased accuracy of rotation O-rings make the GEO a waterproof compass for increased reliability Aluminum billet body assembly makes Brunton GEO nearly indestructible Durable leather carrying case included	2
15	Fossils kit	12 premium educational fossils, Each with an illustrated description card, Geologic Time Chart Card denoting evolutionary milestones.	2
16	Gem Kit	Beautiful collection of polished gemstones is a must for the beginner or seasoned gemstone collector. Must have variety of 25 different Gemstones. Mineral samples range between 3/8 - 1/2 inch	5
17	Polariscope	condensing lens/ Interference Spheres, immersion cell.GEM Polariscope	4
18	Refractometer	with additional polarizing filter attachment, mono chromatic light source Gem-A	1
19	Refractometer liquid	Gem Refractometer Liquid nD = 1.81 +/- 0.005 @ 25°C,	5 bottles
20	Dichroscope	Small hand held London dichroscope Gem-A	5
21	Tweezers	<a href="#">Mudder 6 Pieces Anti-static ESD Tweezer Kit Non-magnetic ESD Tweezers with Storage Bag</a>	5
22	lenses/loupes	Glass Jeweler Geology Antique Loupe Eye Magnifier Magnification: 30/60 ;	3
23	Chelsea Color Filter	Helps identify certain green, red, and blue stones. Detects dyes in certain gems like dyed green and blue chalcedony.	5
24	Spectroscope	Kassoy Prism type spectroscope, Adjustable slit aperture with slide focus	3
25	Digital Specific Gravity Balance	Lightweight Gem Holder Support and Underwater Weighing Pan bullet Independent, Spill-Resistant, <b>Adjustable Beaker Support</b> <b>bullet Beaker for filling with water - 50 to 100ml capacity</b> bullet Aluminum Test Weight whose SG = 2.70 bullet Stainless Steel Tweezers bullet Complete instructions (although this method is very simple) bullet Table of 300 common minerals/gems sorted by specific gravity, with 6 other properties, including refractive index. (Or purchase our Mineral Search software and let your computer do the work of searching a gem and mineral database by specific gravity and other properties)	1
26	Double goose neck (Fiber optic light)	150W Fiber Optic Dual Gooseneck Microscope Illuminator	1
27	lamps	Table Lamp in Black... Table Lamp Colour: Black Bulbs : Included	5

**List of Lab Equipments/Instruments for Department of Geology from Recurring Account. 3<sup>rd</sup> Time Retender**

S.#	Name of Item	Specification	Quantity
1	Ward's Mineral /Equal Thin Sections	Set of 38 minerals A to Z minerals thin sections for petrography lab including igneous, metamorphic and sedimentary rocks	1 set of thin section for each rock.
2	Photo state/Photo Copier Machine must have the facilities of Copy, Print, Fax and Scan	Digital Copier with Printer, Scanner Fax Card Copy Print Speed Black & White: 22 ppm Copy Print Speed Colour: 22 ppm Copying Resolution: 600x600 dpi CPU: Dual Sheeva ARM Interface: USB Magnification Zoom: 25 - 400% Media Sizes: A4, A5, B-Oficio, B5, Executive, Foolscap, Legal, Letter, M-Oficio, Oficio Multiple Copy Prints: 1 to 999 sheets Network Protocol: SMB, SMTP, TCP/IP (FTP, WebDAV)(IPv4/IPv6) Paper Capacity (Sheets): 1000 Sheets Paper Weight: 60 to 300 gsm Photocopier Type: Desktop Print Resolution: 600x600 dpi Processor speed: 800 MHZ Scan Resolution: 600x600 dpi Warm-up Time: 38 Second seconds Weight: 71 Kg Functionality: Copy, Print, Scan Warranty: 1 Year(s) Memory: 2 Power Consumption: 1.58 KW Power Supply: 220-240V 4.5A 50/60Hz	01

		OS: Windows Server 2003 (x32, Windows Vista (x32, x64), x64)/ 7 (x32, x64)/ 8 (x32, x64)/ 8.1 (x32, x64)/ Server 2003 R2 (x32, x64)/ Server 2008 R2/ Server 2012/ Server 2012 R2, x64)/Server 2008 (x32	
3	Sample Splitter/ Quartering box	Universal Sample Splitter w/ 0.55ft <sup>3</sup> Hopper Capacity	1
4	Specific Gravity & Absorption of Fine Aggregate Set	<p>The SG-1 Specific Gravity &amp; Absorption of Fine Aggregate Set is an all-in-one solution used to calculate the volume occupied by the fine aggregate in various mixtures. Features:</p> <ul style="list-style-type: none"> <li>• SG-1 Set includes all items to perform test per ASTM and AASHTO standards</li> <li>• Jar and Top alone available as SG-2</li> <li>• Mold and Tamper available separately as SG-3</li> </ul> <p>Included Items:</p> <ul style="list-style-type: none"> <li>• 1 qt (0.95L) threaded glass jar Pycnometer with rubber gasketed top</li> <li>• Conical Mold</li> <li>• tamper with 25mm diameter face</li> </ul> <p>Meets Standard(s):</p> <ul style="list-style-type: none"> <li>• <u>AASHTO T 84 &amp; ASTM C128</u></li> </ul>	1
5	Specific Gravity & Absorption of Coarse Aggregate Set	Specific Gravity & Absorption of Coarse Aggregate Set is available with a #8 stainless steel wire mesh basket and a polyethylene water container sold together as a handy all-in-one solution	Full set
6	Thickness Gauge (Flakiness Index)	<b>Thickness Gauge (Flakiness Index)</b> is a slotted stainless steel gauge for rapid hand trying of particles from the seven sieve fractions to determine the flakiness index.	1
7	Length Gauge (Elongation Index)	<b>Length Gauge (Elongation Index)</b> has six labeled openings between metal pins for measuring length of particles from each of the six sieve cuts below 50mm, for elongation index determinations.	1
8	Sand Equivalent Test Set	Sand Equivalent Test Set includes four Clear Plastic Graduated Cylinders, a Siphon Assembly, Irrigator Tube, Weighted Foot, Funnel, Measuring Tin, Solid Stopper and 8oz of Stock Solution. All items are packed in a convenient, vinyl-covered latching wooden case with carrying handle.	1
9	Slump Test set with full accessories	<b>Clean Slump Test Set</b> includes a steel slump cone, high-density polyethylene base plate, steel tamping rod, capacity polished aluminum Round-Bowl Scoop, aluminum Filling Funnel, a measuring tape and a sturdy, acid-resistant scrub brush with handle. The slump cone and base plate are easy to clean-up after use and will not corrode. Components meet specification requirements. <b>Meets Standard(s):</b> <u>AASHTO T 119, BS 1881, ASTM C143, ASTM C143M</u>	1
10	Concrete Dial Penetrometer	Concrete Dial Penetrometer is a compact instrument fitted with an easy to read 2.25in (57mm) diameter dial gauge. Dual scales of 0 to 700psi and 0 to 50kg/cm <sup>2</sup> indicate resistance. Maximum readings are locked in until released by push button. The instrument can be calibrated using an	1



		ordinary platform balance and adding or removing the register plates provided. Plastic case, factory certification and instructions are included.	
11	Standard Auger complete set	3in (76mm) Carbon Steel Standard Auger	1
12	Geotechnical Classification Charts along with Sand gauge and geotechnical gauge	Munsell Soil Color Charts for classifying soil color, but may also be used for rocks, archeological specimens, and other natural products. Munsell Charts are a standard tool for geologists, civil engineers, and soil scientists. The tabbed charts include color ranges. Charts for tropical and semitropical soils, and for Australia, SE Asia are now included. A two page Gley Chart for submerged soils covers weak chromas and neutrals of blue and green hues. A white page is used to describe carbonate, silica, gypsum, soluble salt participates and more. Openings between chips allow easy visual comparison with soil samples. Illustrations of soil grain structures, charts for estimating proportions of mottles and coarse fragments, color name diagrams, and instructions are furnished. Color chips are mounted on neutral gray, water resistant pages in a loose-leaf binder.	As per available
13	Tinned Sample Container (Package of 12)	3 ounce tinned sample containers are used to measure Stock Solution when preparing working solution, as well as for sampling and measuring specimen material. Containers are round and metal. <b>Meets Standard(s):</b> <a href="#">AASHTO T 176</a> , <a href="#">AASHTO T 210</a> , <a href="#">CALIFORNIA 217</a> , <a href="#">CALIFORNIA 229</a> , <a href="#">ASTM D2419</a>	12
14	Flasks and volumetric flask	Glass flask of 100ml, 250ml, 500ml and 1000ml  Volumetric Flasks are useful for specific gravity tests such as ASTM D854 and contain the indicated volume at 20°C. These Flasks are available with capacities from 100 to 1,000ml and come with a plastic snap cap. Features: Optimal for specific gravity testing Compliant with ASTM D854  Included Items: Volumetric Flask  Meets Standard(s): <a href="#">AASHTO T 100</a> , <a href="#">ASTM D854</a> , <a href="#">ASTM E288</a> , <a href="#">ASTM E694</a>	6 each
15	Chemicals Stock Solution for Sand Equivalent Test	Stock Solution is a concentrated calcium chloride solution formulated especially for Sand Equivalent testing. The Solution meets ASTM and AASHTO requirements and must be properly diluted to prepare a working solution for testing.  Meets Standard(s): <a href="#">AASHTO T 176</a> , <a href="#">AASHTO T 210</a> , <a href="#">CALIFORNIA 217</a> , CALIFORNIA 229, <a href="#">ASTM D2419</a>	1gal
16	Sodium Hexametaphosphate (1lb Bottle)	This dispersion agent in dry powder form is mixed in soil hydrometer solutions to prevent clay platelets from sticking together.  Meets Standard(s): > <a href="#">AASHTO T 88</a> > <a href="#">ASTM D422</a> > <a href="#">ASTM C775</a>	6 bottles
17	Glass Beakers	Glass Beakers are useful for handling, collecting corrosive solvents and bitumen samples. <b>Sizes:</b> 250 ml, 500 ml and 1000ml	6 each
18	Graduated Cylinders	50ml, 100ml,250ml,500ml, 1000ml Both glass and plastic made	6 each size
19	China dish	Made of ceramic, max. Temp. Up to 800°C	5
20	Spirit lamp	125ml Spirit capacity with burner	5

21	Burner stand	local made for spirit lamp	3
22	Funnels	100ml, 200ml, 500ml, 1000ml	5 each

**List of Lab Equipments for Central Laboratory from Main PC-1 Account (Rs-1.709 B)**

S.#	Name of Item	Specification	Quantity
1	NYMC1280 Digital LED Microscope with WI-FI Enabled 8.4" LCD Screen - 2 Megapixel	Digital part 2.0 Megapixels CMOS Sensor	1
2	Digital Autoclave	Specification Should be: Capacity: 45 liters Heater: 3kW Temp. Range: ambient 05C to 124C Temp. Accuracy: + 5C at 121C Display: PV & SV Dual Digital Controller Timer: Microprocessor PID Multi-Function Controller Pressure: 1.2 kg/cm <sup>2</sup> Gauge: 0 – 3 kg/cm <sup>2</sup> Material Cabinet: Powder Coated Steel Door Packing: One Touch Pressure Handle type Safety over Temp. Pressure and over Current Protector Make: Spain/UK/USA/Germany/Finland or Equivalent	1
3	HPLC+UPS	With Pump, UV Visible Detector, software and necessary accessories, HPLC Column Oven Operating rang should be 30 to 90 C. Temperature accuracy should be + 1C. Temperature Stability should be + 0.2C. Should have Leakage sensor for safety. Column C18 filtration assembly Recent model Computer and Printer. UPS supported the complete system Make: USA / Japan / UK/Equivalent	1
4	Refrigerated Shaking Incubator	Specification Should be:Temp Range: 10°C To 60°CIndependent Controls For Temperature, Timer, And ShakerSpeed: 30-400 Rpm, +/- 4 Rpm (1 Rpm Increments) Stainless Steel InteriorDouble Paned Glass Viewing WindowController: MicroprocessorPID Multi-Function controller Display: LED 4 Digits Display. Material Inner: Stainless Steel (SUS 304)Material Outer: Powder Coated SteelCirculation: Forced Convection Air Circulation.Safety: over Temp. Cut-Off/ over current breakerTimer: 99 hr 50 min/ continuous Capacity: 144 litersMake: Spain/USA/Germany/ Korea or Equivalent	1
5	IR Spectrophotometer	The system should have the following specifications. Wavelength Range: Must have a scan range of 8,300 – 350 cm <sup>-1</sup> optimized, proprietary KBr.Spectral Resolution: 0.5 cm <sup>-1</sup> standard. Wavelength Precision: Better than 0.01 cm <sup>-1</sup> at 3000 cm <sup>-1</sup> Wavelength Accuracy: 0.1 cm <sup>-1</sup> at 3000 cm <sup>-1</sup> Signal-to-noise: 9,300:1 peak-peak, 5 seconds 32,000:1 peak-peak, 1 minute Detectors: High linearity room temperature detector (standard) Optical Windows: KBr (standard), ZnSe option for exceptionally high humidity environments Optics: double beam Communication: USB, wireless and TCP/IP interface allows direct connection with LAN. The system should be preferred with UPS backup. The system should have UATRA Computer :- Core i7 Computer with Printer HP LaserJet)Make: Spain/UK/USA/Germany/Finland or Equivalent	1
6	Atomic Absorption double beam Spectrophotometer	Specification should be: Double Beam (chopper mirror)	1

**List of Lab Equipments for the Department of Pharmacy from Main PC-1 Account (Rs-1.709 B)**

S.#	Name of Item	Specification	Quantity
1	Rotary evaporator	Evaporator Water Bath. Rotary Evaporator Vacuum Pump. Recalculating Cooler./ Chiller	1
2	Analgesimeter	Thick pure aluminium plate, which provide high stability, Temperature. Plate temperature can be held at a set point between above ambient to 70°C (+/- 0.2°C)	1
3	Plethysmometer	Digital water Plethysmometer (cell, calibrator & software provided separately) 1ml, 3ml, 5ml cell	1
4	Sartorius / Electronic Balance	Specification Should be: Capacity: 320 gm Minimum Display: 0.001 gm Repeatability: 0.001 gm Linearity: ±0.002 gm	1
5	UV-visible spectrophotometer (Double beam)	Specifications should be: Wave Length Range: 190---1100 nm Variable bandwidth: 0.5,1,2,4 nm Stray Light: At 220nm (NaI): <0.01%T At 340nm (NaNO <sub>2</sub> ) : <0.011%T At 370nm (NaNO <sub>2</sub> ) :<0.01%T At 200nm (KCl):<1%T Wave Length Accuracy: At D2 peak (656.1nm): ± 0.1nm Wavelength Reproducibility: 10 Measurements at 656.1 nm: ± 0.05nm Photometric Accuracy: At 1A using NIST 930D filter: ± 0.001A At 2A using NIST 1930D Filter: ± 0.005A Potassium dichromate: ± 0.010A Photometric Reproducibility: Maximum deviation of 10 measurements at 1A: <0.001A Photometric Stability: Stability at 1A, at 500nm with 2sec response time: <0.00015 A/hour Photometric Noise at 500nm (RMS): Noise 500 nm/ 0A RMS Slit 1 nm<0.00005A with electrodes USA/Germany/Equivalent	1
		Baseline Flatness: Slit 1nm ± 0.001A Band pass: 0.5, 1,2,4 nm variable Construction: Solid CNC-machine aluminium chassis for thermal and vibration stability. Optics: Double beam, sealed, quartz coated mirror. Lens free system to reduce chromatic aberrations. Monochromator: Seya Namioka. Grating: Holographic, Concave grating with 1053 lines per mm. Source: Deuterium and Tungsten prealigned source with automatic switchover. Computer :- P IV Computer Printer :- HP LaserJet Printer 1102 or equivalent Make: Spain/USA/Germany/ Korea or Equivalent	
6	Power Lab	Power Lab 16/30 Data Acquisition System. 16 Channels with Lab Chart Software, Model ML880 or Equivalent	1
7	Binocular Stereo Microscope	Specification Should be: Optical and mechanical qualities place at the top of that sought-after Category of appliances and the quality ratio is exceptionally good. Head: Binocular Objectives: 0.7 .... 4.5x Zoom Working Distance: 100 mm Stand: Pillar Stand Illumination: Incident and transmitted light, 12V / 10W halogen Make: Spain/UK/USA/Germany/Finland or Equivalent	1

**List of Lab Equipments for the Department of Biotechnology from Main PC-1 Account (Rs-1.709 B)**

S.#	Name of Item	Specification	Quantity
1	Double distillation water plant	All glass made- Borosilicate coil condenser, Out put 4 lit/hr, Water quality: double distillation, Capable of producing pyrogen free water Made in Japan/Germany/USA/ Equivalent	1

2	pH Meter (Bench top)	Specifications should be: pH Range: -2.00 to 16.00 pH Resolution: 0.01 pH Accuracy: + 0.02 pH MV Range: + 1999mV Resolution: 1 mV Accuracy: + 1mV Input impedance: > 1012 ohms Temperature Range: -10 to 105 C Resolution: 0.1 C Accuracy: + 0.5 C ATC Range: -10 to 105 C Manual TC Range: -10 to 105 C Calibration: Manual Display: 3 1/2 digits LCD Power: Battery 9V PP3 or Optional Power Supply Make: Spain/UK/USA/Germany/Korea or Equivalent	1
3	Micropipettes	Range from 0.1-2.5 µl Range from 0.5-10 µl Range from 2-20 µl Range from 5-50 µl Range from 10-100 µl Range from 20-200 µl Range from 100-1000 µl Range from 1000-5000 µl Make: Spain/UK/USA/Germany/Finland or Equivalent	1
4	Ice making Machine	• Production capacity > 100kg/day Storage capacity > 70 kg Water consumption: 0.20m3/day max Power source: single phase 220V Made in Japan/Germany/USA/ Equivalent	1
5	Biological Safety Cabinet Class II	Specification should be: Internal Dimension: 1220x665x650 mm Overall Dimension: 1421x850x2180 mm Inflow Air Velocity: 0.53±0.025 m/s Inflow Air Volume: 465 m3/h Downflow Air Velocity: 0.33±0.025 m/s Downflow Air Volume: 956 m3/h Base Stand Height: 630 mm Exhaust Airflow Volume: 465 m3/h UV Wavelength Lighting: Emission of 253.7 nm Fluorescent Intensity Lighting: ≥650 Lux Base Stand Diameter: 239 mm Base Stand Material: Rectangular steel tube Work Surface Cabinet: 1.5mm 304 Stainless Steel Casing Cabinet: Cold-rolled steel with electrostatic coating Make: USA/UK/Japan/Germany/Equivalent	1
6	Spectrophoto meter	• Wave length range: 180-900nm Setting accuracy: 1nm Resolutions: 0.001 Light Source:Deuterium, Tungsten Sample Compartment: 1cm quartz cuvettes Automatically operated by selecting the reference cell Shomatzo Japan, Hitachi Japan/Equivalent.	1
7	PCR Gradient	• 96 wells USA made (Bio-Rad) or Equivalent	1
8	Colony Counter Digital	Digital Display: 3 digit LED Count: 0 to 999 Dish Size: 50 to 90 mm Max. Plate number to average: 99 Dia (W x D x H): 310 x 300 x 140 mm Net Weight: 1.5 Kg Electricity supply: 230V, 50 Hz, 22W Make: Spain/UK/USA/Germany/Korea or Equivalent	1
9	Western blot apparatus	Bio-Rad made or Equivalent	1
10	Miscellaneous	Miscellaneous (i. Plastic bag Sealers, ii. Lab Timer, Stop watch, iii. Forecepsm Scissors, Scalpeles, Razors, iv. Aluminum Foils, Glass Wares, Plastic wares, v. Syringes, Needles and Filters, vi. Lab. Coats etc.)	

**List of Lab Equipments for the Department of Animal Sciences from Main PC-1 Account (Rs-1.709 B)**

S.#	Name of Item	Specification	Quantity
		<b>Equipments</b>	
1	Water Bath	Sample moist heating,	5
	Trays and Surgical box	Dissection and postmortem	10
	Bacterial colony counter	Bacterial count in samples	1
	Bi-Nocular Microscope	Sample screening, slides testing	1
	Growth Incubators	For sample incubation, equipment sterilization	1

2	Hatchery incubator	Poultry egg incubation (Capacity= 2000 eggs)	1
3	Freezers	Sample storage	3
5	Shaking incubators	sample shaking and incubation	1
6	pH meters	laboratory sample use	3
7	Ammonia detector	detection of ammonia gas in the shed	2
8	digital thermometer and humidifier	detection of temperature and humidity	2

**List of Lab Equipments for the Department of Chemistry from Main PC-1 Account (Rs-1.709 B)**

S.#	Name of Item	Specification	Quantity
1	pH Meter	<p>Specifications should be:</p> <p><b>pH</b>  Range: -2.00 to 16.00 pH  Resolution: 0.01 pH  Accuracy: <math>\pm 0.02</math> pH</p> <p><b>MV</b>  Range: <math>\pm 1999</math>mV  Resolution: 1 mV  Accuracy: <math>\pm 1</math>mV  Input impedance: <math>&gt; 10^{12}</math> ohms</p> <p><b>Temperature</b>  Range: -10 to 105 C  Resolution: 0.1 C  Accuracy: <math>\pm 0.5</math> C  ATC Range: -10 to 105 C  Manual TC Range: -10 to 105 C  Calibration: Manual  Display: 3 1/2 digits LCD  Language: English  Power: Battery 9V PP3 or Optional Power Supply  <b>Make: UK/Germany/Korea/Equivalent</b></p>	2
2	Electronic Balance	<p>Capacity: 320 gm  Minimum Display: 0.001 gm  Repeatability: 0.001 gm  Linearity: <math>\pm 0.002</math> gm  Operating Ambient Temperature: 10 – 30  Temperature Coefficient Sensitivity (ppm/C): <math>\pm 3</math>  Pan Size (mm) approx. : <math>\varnothing 110</math>  Main Body Dia (mm) approx.: 206w<math>\times</math> 291d <math>\times</math> 241h  Power requirement: AC adaptor (DC12V, 1A)  <b>Make: UK/USA/Germany/Equivalent</b></p>	3
3	Hot Plate with	Specifications should be:	16

	magnetic Stirrer	<p>Advanced safety features:  Flashing 'Hot' warning light  Spill proof design  Independent safety circuit to protect against overheating  Microprocessor control for accurate temperature setting</p> <p><b>Technical Specifications:</b>  Plate Material: Glass ceramic  Plate dimensions: 160 x 160 mm</p> <p><b>Description</b>  Heating Area: 120 x 120 mm  Heating Power: 500 W  Max. Plate Temp. : 450 C  Max. Plate (RPM): 100 – 1500  Max. Stirring Capacity: 15 liter  Electrical supply: 230V, 50 Hz, 750W  <b>Make: UK/Germany/Korea/Equivalent</b></p>	
4	UV Lamp (254 and 356 nm) Double Wave Length	<b>With latest good specification (Germany or Equivalent)</b>	<b>2</b>
5	Distillation Assembly	With heating mantle and RB flasks (5L), Made in Germany/Equivalent	1
6	Heating Mantles With Stirrer	strring (50 rpm to 1200 rpm)	2
7	Analytical balance	(0.0001g-1 g)	1
8	Polarimeter	AUTOPOL VI Automatic Polarimeter,	1
9	Ostwald viscometer	small and large, local	10
10	Melting Point Apparatus	<b>Good Quality, Temp range= ambient to 400 °C</b>	<b>2</b>
11	Fume Hood	Wooden, local	5
12	Multi Chanel Micropipette (12x8)1 set	0.1 to 100 µL, Channel 16	1
13	Dunoyes torrosion balance	upto 0.1 N/M, 0-1 g graduated in 2 mg increaments	1
14	Ultrasonic Bath	High-frequency sound waves 42 kHz or 55 kHz Model: CD-4820 Made: China or Equivalent	2
15	Water Bath Shaker	Temperature range: 22 to 90°C Shaking speed: 20 to 200 rpm Volume: 26 L Model: SH2-88 Made: China Or Equivalent	1
16	Spectronic – 20 :	Range: 325-1100 nm, Model = RS 232C, 100-240 voltage compitable or Equivalent.	1
17	Mechanical	Model: BL620D or Equivalent	1

	Stirrer	Speed rpm: 150 to 6000	
18	Liquid nitrogen assembly	50 Kg capacity	1
19	Liquid helium cylinder and assembly	20 Kg capacity	1
20	Hydrogen cylinder	20 Kg capacity	1
21	Pumps for Flash Columns	Local	2
22	FT-IR Spectrophotometer	ca. 700-30cm <sup>-1</sup> region due to high performance interferometer with dedicated multilayer FIR beam-splitter, Purge stabilization time minimized, switch from mid-IR to far-IR, operation, fully motorized beam-splitter and detector changeover system	1
23	Elemental analyzer (CHN analyzer)	CHN, CHNS and Oxygen, fully automated, 60 position autosampler. Collect and store data Perform advanced calculations and/or recalculate results Run queries, generate statistics and create reports	1

**List of Lab Equipments for the Department of Environmental Sciences from Main PC-1 Account (Rs-1.709 B)**

S.#	Name of Item	Specification	Quantity
3	Colony Counter (for microbial colony counting)	STUART SC6 Plus Colony Counter or Equivalent	1
4	UV-visible spectrophotometer	SHIMADZU UV-2700 or Equivalent	1
4	COD Digester	HANNA HI 839800 COD Digester or Equivalent	1
5	BOD Analyzer		1
6	Shaking Incubator	STUART Shaking Incubator, SI600 or Equivalent	1
7	Orbital Shaker	STUART Orbital Shaker SSL1 or Equivalent	1
8	Hot plate with stirrer	STUART Digital Hotplate with stirrer UC152D or Equivalent	4
9	Digital Balance (which can measure upto 0.01mg)	SHIMADZU AUW220D or Equivalent	1
10	Refrigerator with Digital thermometer	THERMO SCIENTIFIC Jewett pass or Equivalent	1
11	Microscope having up to 1000x Resolution	OLYMPUS BX46 Upright Microscope or Equivalent	2

12	Laminar Flow Cabinet or Hood		1
14	Jar Test Apparatus		1
16	Centrifuge	Thermo scientific. Primo™ R Benchtop Centrifuge or Equivalent	1
17	Filtration Assembly with motor		1
18	Auto Clave	Tuttnauer 3840 EL - D Line Benchtop Autoclave or Equivalent	1
19	Water Bath		4
20	Analytical Profile Index Kits(Used for Baterial Identification)		1
21	Bottle top Dispensor (used for acid bottles)		6
22	GIS Software	ARC GIS, ILWIS, Erdas or Equivalent	

**List of Lab Equipments for the Department of Zoology from Main PC-1 Account (Rs-1.709 B)**

S.#	Name of Item	Specification	Quantity
1	Electronic balance (four Digit)	Required for accurately weighing different compounds	2
2	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	To preserve fish feed, experimental samples and organisms. Or Equivalent	3
3	pH Meter (digital bench model) pH range 2 to 19.999, resolution 0.01, accuracy ±0.003, mV range ± 1999mV, manual	To determine the pH values of different solutions or Equivalent	1



	Temperature, comp 32-212°F, epoxy body combination pH electrode, , 4, 7 and 10 pH capsules, swing arm stand, power 9V power supply.		
4	Blenders (various processing capacities) High Throughput, No Cross Contamination , Samples stay cool, Convenient, Risk Free.	To blend the various samples of lab like tissues, muscle etc or Equivalent.	1
5	ELISA Reader	Qualitative and Quantitative of analyses of viral and protein samples	1
6	Analytical balance	Weighing of low quantity of chemicals	3
7	Ordinary Light Microscopes With all accessories	Olympus with cover boxes and cleansers	5
8	kymograph		1
9	Surgical dissection Box Stainless steel, Strong Man.	with scalpel blades and all accessories	20
10	Bp Apparatus Auto/ Manual, Beurer Inc.,	with stethoscope	6
11	Hot Air Oven	Lab, Inner size = 350 350 x 400mm, Drying, High accurate Temperature	1
12	Incubator	Stainless steel Inner Chamber size 400 x 400 x 500, Volume = 80 liter	1
13	Hot Plate With Fume Hood	Satorius, Capacity of 30 flasks, Temperature Range = 100 – 2000°C	1
14	Microwave Oven	Heating/Gel preparation	1
15	Magnetic stirrer	Mixing of solutions and chemicals	1

16	GARMIN GPS ETREX LEGEND HCX:	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 batteris, interface: USB, accepts data cards, micro SD card (not included). Waypoints/favorites/location: 1000, Routes: 50, Track log: 10,000 points, 20 saved tracks. For geographic coordinates of sampling locations	1
17	HAND LENSES. Field magnifying devices used for zooming purposes	magnification of tinny objects	8
18	Temperature control water bath Temp. 10-60oC	To maintain certain temperature of samples during processing	1
19	Stereo Microscope:	Stereo Microscope: Zoom range. 10X eyepiece Magnification with supplementary lenses Free working distance	1
20	Insect nets	Collection of insects	50
21	Insect boxes	For preservation of insects	50
22	Dissection trays	For dissection of animals	50
23	Steel bowls for dissection of insects	for dissection of insects	50

**List of Lab Equipments for the Department of Botany from Main PC-1 Account (Rs-1.709 B)**

S.#	Name of Item	Specification	Quantity
1	RE300-Rotary Evaporator 230V 50HZ.	Features & Specifications: <ul style="list-style-type: none"> <li>• Supplied with Pyrex Glass Diagonal Coil Condenser &amp; I Liter Evaporating and Receiving Flasks.</li> <li>• Lightweight Counterbalanced Lift Mechanism.</li> <li>• Long Life Sparkless induction Motor.</li> <li>• Speed Range 20-190RPM.</li> <li>• PTFE/Glass Liquid Pathway for Chemical inertness.</li> <li>• Long Life Graphite impregnated PTFE Vacuum Seal.</li> <li>• Flask and Vapor Tube Ejection System.</li> <li>• Continuous Feed System for Use with Large Volumes.</li> <li>• Brand: Stuart (UK) or Equivalent</li> </ul>	1

2	Sox halt Apparatus (500mL)	2
3	Heating Mantle (500mL)	1
4	Distillation Apparatus (500mL)	1
5	<p>SZM-405 Stereo Zoom Microscope or Equivalent</p> <p>Features:</p> <ul style="list-style-type: none"> <li>· High quality, high functions and excellent performance</li> <li>· Best choose with ergonomic design,</li> <li>· Sharp image display and wide viewing field.</li> <li>· Diopter adjustable</li> </ul> <p>Specifications:</p> <ul style="list-style-type: none"> <li>· Viewing Tube: Binocular head, inclined at 45"</li> <li>· Diopter Adjustment Eyepiece: EW10)U +20</li> <li>· Zoom Objective: 1X - 4.5X</li> <li>· Zoom Ratio: 1 :4.5</li> <li>· Working Distance: 97 mm</li> <li>· illumination: LED Reflection illumination,</li> <li>· LED Transmission illumination</li> </ul>	1
6	<p>TXB-6201L-Precision Balance or Equivalent</p> <p>Specifications:</p> <ul style="list-style-type: none"> <li>· Expanded piece counting function</li> <li>· Power saving function</li> <li>· Fast and flexible calibration</li> <li>· Can be used anywhere with battery power <ul style="list-style-type: none"> <li>· Capacity 62009m</li> <li>· Minimum display 100m9</li> <li>· Pan size (mm): 160 mm</li> </ul> </li> </ul>	1
7	<p>PA-214. Analytical Balance or Equivalent</p> <p>Features:</p> <ul style="list-style-type: none"> <li>· Easy to Clean Analytical Draft shield</li> <li>· Upfront Level indicator</li> <li>· Selectable Environmental Settings</li> <li>· Removable Doors Provide Convenient Access and Easy Cleaning</li> <li>· Upfront Level indicator Ensures Accuracy</li> </ul> <p>Specifications:</p> <ul style="list-style-type: none"> <li>· Capacity: 220 gm</li> <li>· Minimum Display:0.0001 gm (0.1 mg)</li> <li>· Repeatability: s 0.1m</li> <li>· Linearity: t 0.2m9</li> </ul>	1 set
8	<p>HI-2211.Basic pH/ORP Bench top Meter</p> <p>Specifications:</p> <ul style="list-style-type: none"> <li>· Range:</li> <li>· pH: -2.00 to 16.00 pH</li> </ul>	1

	<ul style="list-style-type: none"> <li>· mV: *399.9 mV;t2000 mV</li> <li>· Temperature: -20 to 120.0°C</li> <li>· Resolution:</li> <li>· pH: 0.01 pH</li> <li>· mV: 0.1 mV; 1 mV</li> <li>· Temperature: 0.1 °C</li> </ul> <p>Accuracy:</p> <ul style="list-style-type: none"> <li>· pH: +0.01 pH</li> <li>· mV: r0.2 mV (t399.9 mV); 11 mV (+2000 mV)</li> <li>· Temperature: *0.4 °C (excluding probe error)</li> <li>· pH Calibration: Automatic, 1 or 2 point with 5 memorized buffer values (pH 4.01, 6.86, 7.01, 9.18, 10.01)</li> <li>· Temperature Compensation: Automatic (with HI 7662 probe) or manual from -9,9 to 120 °C</li> <li>· PH Electrode: HI 1131B, glass-body, single junction, refillable, BNC connector, 1 m cable (included)</li> <li>· Temperature Probe:HI7662 with 1 m (3.3') cable (included)</li> <li>· Input impedance: 1012 Ohm</li> <li>· Power Supply: 12 VDC adapter (included)</li> <li>· Environment: 0 to 50°C (32to 122°F); RH max 95%</li> <li>· Dimensions: 235x222 x 109 mm (9.2x8.7 x4.3")</li> <li>· Weight: 1.3 kg (2.9 lbs.)</li> <li>· Supplied With: <ul style="list-style-type: none"> <li>o With one pH electrode</li> <li>o One temperature probe</li> <li>o One electrode stand</li> <li>o pH 4.01 &amp; 7.01 buffers (20mleach)</li> <li>o HANNA(USA) made or Equivalent</li> </ul> </li> </ul>	
9	<p>Digital Laboratory pH meter Bench top</p> <ul style="list-style-type: none"> <li>· Range:-2 to 19.999 pH</li> <li>· Resolution: 0.001 /0.01/0.1 pH</li> <li>· Accuracy: t0.003 mV range: *1999mV</li> <li>· Resolution:0.1 mV</li> <li>· Accuracy: ± 0.2mV</li> <li>· Temperature Range: -10 to +105 °C (14 to 221°F)</li> <li>· Resolution: 0.1°C (1 °F)</li> <li>· Accuracy: t0.5oC (t1 oF)</li> <li>· ATC range: 0 to 100 °C (32 to 212°F)</li> <li>· Manual temp. Comp: 0 to 100 °C (32 to 212°F)</li> <li>· Power; 9V power supply</li> <li>· Weight: 210 x 250 x 55 mm / 8509</li> <li>· <b>Jenway (Uk) made or equivalent</b></li> </ul>	1
10	<p>H380M Biological Microscope with Camera</p> <p>Features:</p>	1

	<ul style="list-style-type: none"> <li>· infinite Optical System</li> <li>· Perfect image, Koehler illumination</li> <li>· Excellent image Quality</li> <li>· Tilt able Binocular-Trinocular Head 5'-35'</li> <li>· Temperature Controlled Stage</li> <li>· Phase Contrast Attachment</li> <li>· Polarizing, Fluorescent Attachment</li> </ul> <p>Specifications:</p> <ul style="list-style-type: none"> <li>· Magnification: 40X - 1000X</li> <li>· Optical System Infinite Optical System</li> <li>· Viewing Head: Siedentop Binocular / Trinocular</li> <li>· Inclined at 30" Interpupillary Distance 48 - 75 mm</li> <li>· Eyepiece: Wide Field (EWF) 10X (FN 22)</li> <li>· Nosepiece: Reversed Quintuple Nosepiece</li> <li>· Objectives: Plan Achromatic 4X, 10X, 40X, 60X, 100X(Oil)</li> <li>· Condenser: Swing NA 0.90/0.25</li> <li>· Focusing Coaxial Coarse and Fine Focusing</li> <li>· Fine Division 0.001mm</li> <li>· Stage Double Layer Mechanical '185 X 142mm,</li> <li>· Cross Travel 75 X 55mm,</li> <li>· HT company made or Equivalent</li> </ul>	
11	<p>BBS-DDC Vertical Laminar Flow Cabinet</p> <ul style="list-style-type: none"> <li>· External Size (W x D x H): 1040x600x1730</li> <li>· Internal Size (W x D x H): 940"580*540</li> <li>· Base Stand: 650mm height</li> <li>· Display: LED</li> <li>· Main Body: Cold-rolled steel with anti-bacteria powder coating</li> <li>· Work Table: 304 stainless steel</li> <li>· Front Window: 5 mm toughened glass, anti-ultraviolet radiation</li> <li>· Pre-Filter; Polyester fiber , Washable</li> <li>· HEPA Filter: Efficiency 99.999% at 0.3pm</li> <li>· Airflow Velocity: Average of 0.3-0.5m/s</li> <li>· Noise: &lt;60 dB</li> <li>· Max Opening: 350mm</li> <li>· Fluorescent Lamp: 21W*1</li> <li>· UV Lamp: 20W*1</li> <li>· Consumption:350W</li> <li>· Caster: Universal Wheel with brake</li> <li>· Power Supply:1 1 01220Y t10%;50I6QHZ</li> <li>· Standard Accessory: Fluorescent Lamp, UV Lamp,</li> <li>· Biobase (China) made or Equivalent</li> </ul>	1
12	<p>Aluminum TLC Plates 20 x20, Merck made or Equivalent</p>	1
13	<p>TLC Tank with Grooves,</p>	1

	Spain made or Equivalent	
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**List of Lab Equipments for the Department of Agriculture from Main PC-1 Account (Rs-1.709 B)**

S.#	Item Name & Specification	Quantity
1	Plant Growth Chamber Dimension ( x d x h) mm: 1200 x 600 x 1200, Capacity 864 Lit. Heater: 4.9 kW, Temperature Range: 10 0C – 60 0C, Temp. Accuracy: + 0.1 0C, Humidity: 30% - 95 % RH. Humidity Accuracy: + 0.1 %, Electronic Sensor, Evaporation by fan with heater, Controller: Programmable digital PID controller, Shelves: 3 Teflon coated steel shelves with adjustable position or equivalent. Korea Made.	2
2	Photosynthes Measuring Apparatus: 500 MB RAM, 8 GB data storage, 6 cm2 leaf analyzer. Sensor Head with CO2/H2O Analyzer. Chamber with PAR sensor with rechargeable batteries and battery charger. Charger. Windows software and all other accessories or equivalent.	1
3	Leaf Area Meter: Resolution 1 mm2 or 0.1 mm2 (interchangeable) Display 1 mm2 Resolution 999,999.99 cm2 , Display 8-digit LED, width 1 mm2 resolution 25.4 cm maximum, 11.5-3mm minimum, length unlimited, Conveyor belt speed 8 cm s-1 or equivalent.	1
4	Seed Germinator:Chamber 1, Capacity 10 cft, Chamber Size Length 550, height 950, width 550 mm, Outside Chamber Painted Steel 20SWG, Inside Stainless Steel No. of trays : 3 adjustable stainless steel wiremesh trays. Tray size 530mm x 530mm.	2
5	Ovens:Temp range ambient +5 deg C to 250 oC, fuzzy control system, 155 Liters, Timer 99 hr, 59 min, 3 shelves. Korea Made or equivalent	3
6	Electrical Grain Counter: Grain Size Range 0.3-15 mm, Counting per batch upto 1000, Counting speed 500 per minute (depending on seed size) , Electric Power Supply 90-240 volts Or equivalent.	1
7	Florescence spectrophotometer: Light source 150 W Xenon lamp. Wavelength 200 – 900 nm. Wavelength accuracy + 1.5 nm Approx Price 0.8 million Approx. Price 2.0 million.	1
8	Top Loading Balance:The required readability is 1 to 10 mg (0.001 to 0.01 g). The desired capacity is 300 g or equivalent.	2

**List of Lab Instruments/Glassware for the Department of Environmental Sciences from Main PC-1 Account (Rs-1.709 B)**

S.#	Instrument	Quantity
1	pH meter	2
2	Conductivity meter	1
3	Distilled water Assembly	1
4	GPS (Garmin etrex 30x)	2
5	Turbidity meter	2
6	First Aid Kit	1
7	Compass (Brunton)	2

8	Water Fluoride meter	2
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<b>S.#</b>	<b>Apparatus/Glassware</b>	<b>Quantity</b>
1	Auto Clave Bags	24
2	Beakers (100 ml, 250ml, 500ml)	48 each
3	Beaker (1 L)	12
4	Büchner funnel	12
5	Büchner funnel (steel made)	6
6	Burrete (100 ml)	48
7	Burrete Stand with clamps	24
8	Butter Paper	2 Packs
9	China Dish (100, 250 ml, 500ml)	24 each
10	Chemical Splash Goggles	24
11	Condenser	24
12	Crucible with led	24
13	Desiccator (with porcelain plate)	04
14	Eppendorf Tubes	12
15	Flat Bottom Flask (500ml)	12
16	Filtration Flask	24
17	Filter paper	24 sheet
18	Funnel (small and Large)	24 each
19	Glass Columns (for column studies) all sizes	5 each
20	Glass Rod	24
21	Glass Spreader	12
22	Gloves for Oven and Furnace	2
23	Graduated Cylinder (10ml, 25 ml, 50ml, 100ml)	24 each
24	Indicator Bottles with droppers	20
25	Lab Safety Goggles	24
26	Litmus paper	10 pkt

27	Mortar and Pestle (steel and stone made)	<b>2 each</b>
28	Pair of Tongs	<b>12</b>
29	Petri Plates (for microbial Culture)	<b>84</b>
30	Pegboard Glassware Drying Rack with Drip Tray	<b>3</b>
31	Pipette (Automatic)[1-100 $\mu$ l, 1ml and 10 ml] with Disposable tips	<b>4 each</b>
32	Pipette [Glass made (1 ml, 2ml, 5ml, 10ml, 25ml)]	<b>24 each</b>
33	Pipette Controller	<b>10</b>
34	Pipette pump (latest)	<b>24</b>
35	Plastic Gloves	<b>6 packs</b>
36	Reagent Bottles	<b>50 pieces</b>
37	Round Bottom Flask (500ml)	<b>12</b>
38	Rubber Corks (Different Sizes)	<b>84</b>
39	Sampling Bottles (200 ml, 500ml)	<b>100 each</b>
40	Safety Masks	<b>3 packs</b>
41	Separator Funnel	<b>12</b>
42	Spirit Lamp	<b>6</b>
43	Spray Bottle	<b>12</b>
44	Spatula and spoon kit	<b>4</b>
45	Teste Tubes	<b>200</b>
46	Test Tube Holder	<b>24</b>
47	Test Tube Stands (steel and plastic)	<b>24 each</b>
48	Titration Flask (250 ml, 500ml)	<b>48 each</b>
49	Titration Flask (500 ml)	<b>36</b>
50	Tripod stands	<b>24</b>
51	Watch Glass	<b>24</b>
52	Wash Bottles	<b>24</b>
53	Washing brushes (different sizes)	<b>24</b>
54	Weighing boats	<b>50</b>



55	Wire gauze	<b>50</b>
56	Volumetric Flasks (100ml, 250ml, 500 ml and 1 Ltr)	<b>24 each</b>
57	Vacuum Adapter (both straight and bent)	<b>6 each</b>
58	3-way distillation adopter	<b>6</b>

**List of Lab Chemicals for the Department of Environmental Sciences from Main PC-1 Account (Rs-1.709 B)**

<b>S.#</b>	<b>CHEMICAL</b>	<b>Quantity</b>
1	Sulphuric Acid	2.5 Litre (4 Bottle)
2	Hydrochloric Acid	2.5 Litre (4Bottle)
3	Nitric Acid	2.5 Litre (3Bottle)
4	Perchloric acid	2 bottles
5	Sodium Hydroxide Pellets	2 Bottles
6	Acetic Acid	1 Bottle
7	Sodium Acetate (anhydrous)	1 Bottle
8	Silver Nitrate	1 Bottle
9	Acetone	2 Bottle
10	Ethanol	2 Bottle
11	Gram Staining Reagents (Crystal Violet, Iodine, Safranin)	1 Bottle each
12	Aluminum Sulphate	1 Bottle
13	Ferric Chloride	1 Bottle
14	Mercuric Sulphate	1 Bottle
15	Silver Sulphate	1 Bottle
16	Potassium Chromate	1 Bottle
17	Potassium Dichromate	1 Bottle

18	Sodium Carbonate	1 Bottle
19	Sodium Thiosulphate	1 Bottle
20	Potassium Iodide	1 Bottle
21	Ferrous Ammonium Sulphate	1 Bottle
22	PH 10 Buffer	2 Bottles
23	Ethylene Diamine Tetracetic acid (EDTA)	1 Bottle
24	Erichrome Black T (EBT) Indicator	1 Bottle
25	Ferrouin Indicator	1 Bottle
26	Starch Indicator	1 Bottle
27	Methyl Orange Indicator	1 Bottle
28	Phenolphthalein Indicator	1 Bottle
29	EMB Agar	1 Bottle
30	Nutrient Broth	1 Bottle
31	Nutrient Agar	1 Bottle
32	Cetrimide Agar	1 Bottle
33	Mackonky Agar	1 Bottle
34	Minimam Media	1 Bottle
35	Tryptone Soy Agar and Broth	1 Bottle
36	Sucrose	1 Bottle
37	Glucose	1 Bottle
38	Oxidase	1 Bottle
39	Sodium Chloride	1 bottle

40	Tricalcium phosphate	1 bottle
41	Magnesium Chloride	1 bottle
42	Magnesium sulphate	1 bottle
43	Potassium chloride	1 bottle
44	Ammonium sulphate	1 bottle