

مولانا آزاد نیشنل اردو یونیورسٹی  
MAULANA AZAD NATIONAL URDU UNIVERSITY

**MAULANA AZAD NATIONAL URDU UNIVERSITY**

(A Central University established by an Act of Parliament in 1998)

Gachibowli, **Hyderabad** – 500 032

**No: MANUU/Purchase/F.88/2017-18/T.No. 03**

**Date: 02.11.2017**

Cost of tender form Rs. 500/- through DD favour in MANUU, payable at Hyderabad

(Note: Exemption of Tender Cost/EMD for registering with MSME, NSIC, N.C.C.F, Kendriya Bhandar etc will be considered as per GOI rules on submission of documentary proof.)

**TENDER DOCUMENT FOR SUPPLY AND INSTALLATION OF LAB  
EQUIPMENT FOR DEPARTMENTs UNDER SCHOOL OF SCIENCE  
OF THE UNIVERSITY**



*Last date & time of submission of technical and financial bids* : 27.11.2017  
at 3:00 p.m.

*Date and time of opening of technical bids* : 27.11.2017  
at 3:30 p.m.

## Chapter-I : Instruduction

1. **Preface:** Maulana Azad National Urdu University (MANUU) is a Central University established by an act of Parlimament in 1998 with headquarter at Hyderabad and other campuses, colleges and Regional Centres located all over India.
2. **Call for tender:** MANUU invites sealed tenders from original manufacturer / Govt. organizations / authorised dealers / reputed firms to supply and install the lab equipments for Departments under School of Science, MANUU. This is tender cum rate contract initially for a period of one year. The requirement mentioned in the tender may be spread over a period of one year and will be procured accordingly.
3. **Submission of tender:** The sealed tenders are invited for supply and install the lab equipments for Departments under School of Science, MANUU at Hyderabad under **two bid system** viz. 1) **Technical bid** (*Annexure-II duly signed and stamped, consisting all technical details along with commercial terms and conditions and relevant documents, tender cost and EMD. The details of tender cost and EMD are given at S.No.5/Chapter-II: Terms & Conditions.*) 2) **Financial bid** (*indicating items-wise price for each category of the respective trade category in Annexure-III. These two separate sealed covers should be kept in a third envelope on which it should be super scribed 'Open Tender for supply and installation of lab equipments for Departments under School of Science, MANUU, Hyderabad, addressed to the Asst. Registrar, Purchase Section.*
4. **Quoting of items:** The vender may quote for all the items / part of items of Annexure-II and should agree to accept the part supply order as per the criteria of lowest bid for each item GoI rules will be considered. Unit prices are to be quoted both in figures and in words. In case of discrepancy, price quoted in words or figures whichever is less will be taken as valid.
5. **Opening of bids:** The Technical bids will be opened and scrutinized. The firm, which meets the basic requirement as per documents furnished, may be invited for full fledge display / demonstration. The committee of the University may visit the firm / showroom for the items supplied to other organizations to ascertain the quality. The University may also ask the firm to submit the samples before opening of financial bid / execution of order. The University may shortlist and consider overtere best quality lab equipments firms. The University will not bear any expenses for presentation of samples. The financial bid will be opened for those firms which qualify technically and whose sample has been agreed up to the satisfaction level of the University. The decision of the University will be final in this regard.
6. **Selection of firm:** The lowest quoted firm will be selected on item wise basis subject to satisfaction of the quality of the product. The decision of the committee will be final in this regard.
7. **Alteration in the bid:** Bidders will not be permitted to alter or modify their bids after expiry of the deadline of receipt of bids.
8. **Availability of tender form:** The tender document can be had from Purchase Section on payment of DD of Rs. 500/- (non refundable) or can be down loaded from the University's web site ([www.manuu.ac.in](http://www.manuu.ac.in)). If downloaded, the cost of tender amounting to Rs. 500/- (non refundable) is to be submitted by way of a demand draft drawn in

favour of “Maulana Azad National Urdu University” payable at Hyderabad along with technical bid. The downloaded tender form without demand draft will not be accepted.

9. **Cost:** The rates quoted should be inclusive of all taxes, levies, freight, insurance, transportation, installation etc. Rates are to be quoted in the financial bid as per tender document (Annexure-III) else it shall not be considered. The element of taxes is required to be shown separately and distinctly.
10. **Offices location:** The firm should have its office within GHMC limit of Hyderabad / Secunderabad to provide service after sale and to furnish the addresses of service centre with telephone number along with technical bid.
11. **Repair and maintenance:** The firm selected has to identify one single point for effective services and to attend for repair within 24 hours from the time of booking the complaint.
12. **Validity period of quotation:** Firms tendering should note that their offers should remain open for acceptance up to 120<sup>th</sup> days; if the 120<sup>th</sup> day falls on holiday then last date will be the next working day from the date of opening of tender.
13. **Acceptance of tender:** The University does not pledge itself to accept the lowest or any tender and reserves to itself, the right to accepting the whole or any part of the tender or rejecting completely.

## Chapter–II: Terms and Conditions

1. **Rejection of tender:** The conditional tenders, unsigned bids, without required EMD and cost of tender form (if downloaded form is used) shall not be accepted and any query / intimation will not be entertained on such bids.
2. **Specification:** The desired specifications and allied technical details are placed at Annexure-I. If required the same may be amended / up graded at the time of placing purchase order. These are basic specifications; the firm may quote the same or higher specifications as per enclosed Annexure only.
3. **Technical bid:** The technical bid must contain the specifications as per the Annexure–II (A to D) and indicate that the firm is ready to supply items of the required specifications or upgraded by mentioning “Yes / No” in against each item. The firm has to quote as per the required specifications. However higher Specification / technically up graded can be considered by the University. Detailed specifications, catalogue / literature, of all the items quoted may be supplied with the technical bids. Incomplete Bid / in adequate specification etc., in any respect are liable to be rejected. In case, the firm intends to supply the item with a different specification, it should be specified invariably. The firm should in variables indicate the make / model / manufacturer of the item against each item.
4. **Date and place of submission of form:** The technical and financial bids should be submitted to the Purchase Section, Maulana Azad National Urdu University, Gachibowli, Hyderabad – 500032 by **3:00 p.m.** on **27.11.2017**. Tenders received after due date and time will not be considered. The technical bid will be opened on the same day at **3:30 p.m.** in presence of vendors or their authorized representative. The representative should bring the authorization letter from their vendor for attending the tender opening committee meeting. If the opening day is declared as holiday on account of unforeseen situation, it will be on next working day.
5. **Bid security / EMD:** The filled in tender form without requisite bid security / EMD and cost of tender will not be considered and both are to be drawn separately favouring

“Maulana Azad National Urdu University” payable at Hyderabad. The Security bid of unsuccessful bidders will be returned without interest. Bid security/EMD of the successful bidder will be converted into Security Deposit of 10% cost on payment of differential amount or released on submission of Bank Guarantee / Demand Draft / FDR for 10% cost. The firms claiming exemption of EMD / Tender Cost may have to furnish necessary proof thereof. The cost of tender form and security bid / EMD amount is as follows:

Sl.	Description
1.	<p><b>Tender cost</b> for the various departments for furnishing the quotations of Rs. 500/-</p> <p>(Note: Exemption of Tender Cost/EMD for registering with MSME, NSIC, N.C.C.F, Kendriya Bhandar etc will be considered as per GOI rules on submission of documentary proof.)</p>
2.	<p><b>Bid security / EMD</b> for the various departments of School of Science for furnishing the quotations (Annexure-wise)</p> <p>Annexure – I (A) Department of Zoology : 1,15,000/- (refundable)</p> <p>Annexure – I (B) Department of Botany : 67,000/- (refundable)</p> <p>Annexure – I (C) Department of Chemistry : 22,000/- (refundable)</p> <p>Annexure – I (D) Department of Physics : 56,000/- (refundable)</p> <p><b>Total (for all annexure) : <u>2,60,000/-</u></b> (refundable)</p> <p>(Note: Exemption of Tender Cost/EMD for registering with MSME, NSIC, N.C.C.F, Kendriya Bhandar etc will be considered as per GOI rules on submission of documentary proof.)</p>

6. **Company profile:** The bidders must submit their company profile, make / brand of the items etc. supplying. A list of organizations / agencies to which items have been supplied previously may be submitted along with copies of supply order, with the technical bid.
7. The firm shall take all security measures as per Government rules while transport, installation etc.
8. **Bidders shall have to meet the following pre-qualification criteria:-**
  - a) Having the Average Annual Turnover of 15,70,398/- (30% of the quoted value) of the value for which the quotations are furnished, during the last three years.  
And
  - b) (i) Should have supplied similar products of three purchase orders of the worth Rs. 20,93,864/- each (40% of the quoted value) of the value during the last 7 years for which the quotations are furnished  
**or**  
(ii) Should have supplied similar products of two purchase orders of the on worth Rs. 26,17,330/- each (50% of the quoted value) of the value for which the quotations are furnished during the last 7 years.  
**or**  
(iii) Should have supplied similar products on one purchase order of the worth Rs. 41,87,728/- (80% of the quoted value) of the value for which the quotations are furnished during the last 7 years.
9. **Repeat order:** This is a tender cum rate contract for a period of one year and the item offered in the tender can be re-ordered at the same rate, terms & conditions within a period of twelve (12) months.

10. Orders of different organizations to whom supplied during the last two years preceding may be attached.
11. **Delivery and Installation:** The firm shall deliver the lab equipments at School of Sciences, MANUU, Hyderabad and install the same within **60 days** from the date of issue of Purchase Order.
12. **Warranty:** All the items should be with onsite comprehensive warranty for a minimum period of one year or as per OME warranty period, whichever is later) after satisfactory installation and acceptance by the University. The firm should repair / replace the faulty items free of cost during the warranty period.
13. The firms should submit OEM/authorization certificate specific to this open tender or copy of authorized dealership distributor Certificate.
14. **Payment terms:** No advance payment will be considered, The payment will be released in Indian rupees in the following order:
  - (i) **90% payment of purchase order:** After supply of items and installation, subject to certification by the concerned officials of the University.
  - (ii) **10% payment of purchase order / security deposit:** After availing the warranty period of one year or on receipt of Bank Guarantee of any nationalized bank of equal amount for a period of 60 days after the period of warranty.
15. **Quantity:** The quantity mentioned in the tender can be increased or decreased at the discretion of the University and the decision of the University shall be final in all respects.
16. **Registration:** The firm should be registered with the government agency for sales tax and service tax, income tax incorporation and the certificate of registration issued by appropriate government authority for required items.
17. University GSTIN is **36ACAPA0112H1ZL**, the bidder shall invariably indicate the details of GST i.e. percentage / value in the bid as well as in the tax invoice.
18. **Right of the University:** The University reserves the right to reject or accept any tender without assigning any reason or cancel before issuing Purchase Order. In case of cancellation of the tender the EMD only will be returned without interest.
19. **Acceptance of terms and conditions:** All pages of the tender document are to be signed and stamped by the tendering firm as agreed by the terms and conditions of the tender and to be attached along with the technical bid.
20. **Penalty clause:** The supply of the items has to be completed within the stipulated period indicated in Purchase Orders. In case of delay the University reserves the right to impose penalty, as follows:
  - (i) **Liquidated Damages:** If the firm fails to supply and install the items of desired quality and quantity or part of it or unable to perform the service within specified periods for reasonable cause, the University shall, without prejudice to its other remedies under the contract / order may deduct from the contract price, as liquidated damages, a sum equivalent to 0.5% per week of the value of undelivered service of the

goods or unperformed services limited to a maximum of 10% value of the purchase order / left over cost. Once the maximum is reached, the University may consider termination of the contract / order without any notice and further serious action may be initiated. Late supply to the maximum of 10% will be deducted from the bill after which the order will remain cancelled and Bid Security / Earnest Money deposit will be forfeited.

(ii) **Termination for default:** The University may, without prejudice to any other remedy for breach of contract / order, by written notice of default sent to the firm, terminate the contract / order in whole or part at the risk and cost of the defaulting firm.

(a) If the firm fails to execute the supply of all the material specified in the order within the period(s) of desired quality and quantity specified in the order, or within any extension therefor granted by the University, or

(b) If the supplier fails to perform any other obligation(s) under the contract / order.

(c) If any defects are observed in the items, the University will have the right to reduce the payment to be made to the firm and take any other suitable action against the firm, and the University decision will be final in this regard.

21. **Applicable Laws :** In all matters and disputes arising hereunder, shall be governed in accordance with the Laws of India for the time being enforced and will be subject to the exclusive jurisdiction of Courts in Hyderabad.

22. **Settlement of Dispute:** In case of any dispute, Hyderabad will be the Jurisdiction and the Registrar, Maulana Azad National Urdu University, Hyderabad shall decide the issue and his decision will be final and shall be binding on both the parties as per following terms:

(i) The Purchaser and the Supplier shall make every effort to resolve by direct negotiation any disagreement or dispute arising between them under or in connection with the contract.

(ii) If the parties have failed to resolve their dispute of difference by such consultation, then either the Purchaser or the Supplier may give notice to the other party of its intention to settle the issue by arbitration, as herein provided, as to the matter in dispute. No arbitration in respect of the matter be commenced unless such notice is given in accordance with this clause for the final settlement of the matter. Arbitration may be commenced prior to or after delivery of the Goods under the Contract.

(iii) All questions, disputes and differences arising shall be referred by the Vice Chancellor, MANUU to the sole arbitrator for arbitration under the provision of the Arbitrations and Conciliation Act, 1996. The decision of the Arbitrator shall be final in this regard.

23. **Obligation during Arbitrations:** Notwithstanding any reference to arbitration (a) the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree; and (b) the Purchaser shall pay any amount due to the Supplier.

Sd/-

**Registrar**

Maulana Azad National Urdu University  
Hyderabad

Place: Hyderabad

Date: 02.11.2017

**Encl:** (i) Annexure –I (A to D)  
(ii) Annexure-II [i & ii (A to D)]  
(iii) Annexure-III (A to D) Financial Bid

**Annexure – I (A to D)****Chapter – III: Requirement and specification of the labs equipments:****Annexure - I (A) Department of Zoology:**

Sl.	Name of the Equipment	Quantity
1.	<b>Lab Microtome</b> (Section thickness - 0.5–60 µm; thickness selection from 0.5–2 µm in 0.5 µm-steps, from 2–10 µm in 1 µm-steps, from 10–20 µm in 2 µm-steps, from 20–60 µm in 5 µm-steps, Total horizontal specimen feed -5 mm, Vertical specimen stroke - 59 mm, Specimen retraction - ON/OFF, Specimen orientation: Horizontal -8°, Vertical - 8°, Rotation - ± 90°, Trimming thickness -10 µm, 50 µm)	01
2.	<b>Sphygmomanometer</b> (BP meter) clinical grade	02
3.	<b>CO2 Incubator</b> (Stainless steel body, Range 0 to 20%; CO2 Sensor Technology-IR; Oxygen Control -1 to 20%; O2 Sensor Technology – IR; Relative Humidity Ambient to 95% @ 37°C (98.6°F); Temperature Range (Metric) 5°C above ambient to 55°C; Voltage 230V; CO2 Concentration Control more than ±0.1%; No. of Shelves -4 standard, dimensions -63.5 x 66 x 100.3cm)	01
4.	<b>ELISA Reader</b> (Microplate able to read up to 96 wells, wavelength range 400-750 nm with absorbance range 0-3.0 abs, accuracy and linearity 1%, tungsten halogen lamp, five filter capacity with interference of 405, 450, 490, & 630 on filter wheel, display 2x24 digit LCD, extensive on-board data analysis, curve fitting options as linear, cubic, quadratic, cubic spine, point to point assay & control validation, data transformation formulas, cut off & call criteria, memory, parallel centronics for printer, power supply 230 VAC; Washer: Should have processes for full 96 wells, wash cycle 1-10 and wash heads 8 channels with wash protocols. Dispensing volume 1 l, shaking should be use programmable speeds, programmable washing, dispensing, aspiration, rinsing, and priming, built in pumps aerosol cover.)	01
5.	<b>Western Blotting Apparatus</b> (Mode of Transfer: Semi-Dry: Gel Compatibility- NuPAGE® Gels, Novex® Midi Gels, Novex® Mini Gels; Running Dimension: Horizontal; For Use with (Equipment): Novex® Semi-Dry Blotter; Capacity: Up to 4 mini-gels, Up to 2 midi-gels, Up to 2 E-PAGE gels; Gel Size: Midi (8 cm x 13 cm), Mini (8 cm x 8 cm))	01
6.	<b>PAGE Unit</b> (Gel Capacity - 1-2 Gels; Number of Gels Max – 2; Number of Gels Min – 1; Operating Temperature 0°C-45°C; Power <20 W; Total Separation Time -3-5 h; Voltage -500 VDC; Volume Buffer volume:350 ml (Minimum upper buffer volume); 150 ml (Minimum lower buffer volume); 350 ml (Maximum lower buffer volume)	01
7.	<b>Class II, Type A2 Biological Safety Cabinet</b> - (Long-life ULPA filters for supply and exhaust (per IEST-RP-CC001.3) with 99.999% efficiency for particle size between 0.1 to 0.3 microns; Coved single-piece work surface; One-piece back wall; Microprocessor with LCD display, Quickstart mode, RS 232 data output port, control pad that ADA-compliant., Raised airflow grille, antimicrobial coating on all painted surfaces, Night setback mode / standby mode)	01
8.	<b>Spectrophotometer</b> (Wavelength range -190 to 1100nm; Spectral bandwidth-1nm (190 to 1100nm); Wavelength display -0.1-nm increments; Wavelength setting 0.1-nm increments (1-nm increments when setting scanning range); Wavelength accuracy- ±0.1nm at 656.1nm D2; ±0.3nm (190 to 1100nm); Wavelength repeatability ±0.1nm; Stray light less than 0.02% NaI at 220nm, NaNO2 at 340nm; less than 1.0% KC I at 198 nm; Photometric system Double Beam Photometric range Absorbance: -4 to 4 Abs Transmittance: 0% to 400%; Photometric accuracy ±0.002 Abs (0.5Abs); ±0.004 Abs (1.0Abs); ±0.006 Abs (2.0Abs); Photometric repeatability less than ±0.001 Abs (0.5Abs); less than ±0.001 Abs (1Abs); less than ±0.003 Abs (2.0Abs), Baseline stability less than 0.0003 Abs/H at 700nm (one hour after light source turned ON); Baseline flatness within ±0.0006 Abs; (190 to 1100nm, one hour after light source turned ON); Noise level Within 0.00005 Abs RMS value (at 700nm)	01

9.	<b>Gel Documentation System:</b> with provision for Fluorescence; Colorimetry and densitometry and Gel Documentation System; maximum sample size-28 x 36 cm; Maximum image area-19.4 x 26 cm; Excitation source- Epi-white light and trans-UV (302 nm); with trans-white conversion screen and XcitaBlue™ ; UV/blue conversion; Illumination control 3 modes (trans-UV, trans white, epi-white); Detector- CCD; Image resolution-4 megapixels; Pixel size (H x V)- 4.65 x 4.65 µm; Filter holder -3 positions (2 for filters, 1 without filter); Emission filters -1; Dynamic range- >3.0 orders of magnitude; Pixel density (gray levels)- 4,096; Operating voltage 110/115/230 V AC nominal; Operating temperature-10–28°C; Operating humidity- <70% non-condensing; Workflow automated; user selected or recalled by a protocol; Workflow reproducibility -100% repeatability via recallable protocols; with image capture to quantitative analysis and reports; Autofocus (patent pending) Pre-calibrated focus for any zoom setting or sample height ; Dynamic; pre-calibrated and optimized per application; Autoexposure-2 user-defined modes (intense or faint bands)	01
10.	<b>Sonicator:</b> user-friendly, Full amplitude control from 1-100%; high degree of resolution; efficient settings for processing samples; output up to 700 watts of power, Frequency-20 kHz; Programmability- 10 memories plus sequencing; Programmable Timer- 72 hours; Adjustable Pulse On/Off - 1 second to 24 hours; Voltage -11V, 50/60 Hz, with generator, converter, power cable, wrench set and probes (1 in and 1/8in micro tip)	01
11.	Haemoglobin meter clinical grade	10
12.	Water Bath Shaker, Capacity - 250 ml x 6 flasks, Shaking speed range -40-180 strokes per min, Heating - Up to 95°C, Stroke Length - 25 mm, accuracy + 1 C	01
13.	Upright Binocular compound Microscope 40-1500x, 10x (F.O.V.: 22mm): eye piece CM type with 90 crosshair and micrometer scale, 360° rotary dial, Quadruple nosepiece fixed to main body, Fine: 0.2mm per rotation; Coarse: 37.7mm per rotation; Minimum reading: 2µm on left-side fine control knob: Coarse motion torque adjustable; illumination- 6V/30W halogen lamp precentered and prefocused; Continuously variable intensity control, Objective Lens - CFI P Achromat 4x, 10x, 20x, 40x, 100x oil for episcopic illuminator	01
14.	Binoculars 10x50 DPS	02
15.	Field binoculars	15
16.	Sieves Set from pore size of 150 250 400 1000 microns (brass frame)	1 set
17.	Magnifying lens (Optical-quality, glass lens with 4X power magnification for high visibility)	06
18.	Wet and dry thermometers	04
19.	Digital camera SLR +accessories (20 mega pixels resolution wifi enabled, with zoom 18 x)	01
20.	Digital cameras with zoom	02
21.	<b>Incubator BOD</b> (Temperature Range-5 to 60°C; Temperature Accuracy- + / - 0.5°C; Temperature Uniformity-+ / - 0.5°C Power; 220 Volt-Temperature Control microprocessor Control; Steel Powder Coated exterior; Inner Chamber 304 Stainless Steel; Shelves -1 to 5 Stainless Steel, Insulation Polyurethane Foam; Glass Door; Inner Clear Door; Cooling - CFC Free; Refrigerant R134a; Heating System U Shaped S. S. Nichrome Wire Air Heater; Air Circulation - Fan or Blower; with Door Lock; Interior Light; Display-LED / LCD)	01
22.	<b>Autoclave Thermostat</b> (SS-body), 500X 300 mm & 40 lit; Vertical Size, Load KW: 6(3ph), Lid ring & lid, outer cover	01
23.	<b>Kymograph</b> (drum type)	02
24.	Thin layer chromatography plates	02
25.	UV-protective goggles	04
26.	Sensitive electronic Balance 0.01 mg to 60 gm, digital display	01

**Annexure – I (B) (Department of Botany):**

Sl.	Name of the Equipment	Quantity
27.	Hot Plate with magnetic stirrer (Stirrers with Hotplate, stirring quantity-2 Ltr, Stirring Paddle (PTFE coated), 200 W x 225 D x 185 H in mm, at least 1200rpm)	01 pc
28.	Autoclave Thermostat (SS-body), 500X 300 mm & 40 lit; Vertical Size, Load KW: 6(3ph), Lid ring & lid, outer cover	01 pc
29.	Electronic Weighing Balance, Accuracy - 0.01 g, capacity upto 500 g, Display Type- LED	02 pc
30.	Deep Freezer (- 25 C to - 5C), 350 lit, vertical type, digital display, accuracy of 1 C.	01 pc
31.	Steel Lockable Laboratory Storage Cabinets 18"x36"x6', powder coated 18 gauge thickness steel	01 pc
32.	Steel Laboratory Storage Cabinets 18"x36"x6', powder coated 18 gauge thickness steel (With glass doors)	05 pc
33.	Table top Centrifuge with 16000 rpm speed, rotors with 2 ml, 15ml/ 50 ml adapters	01 pc
34.	Microwave Oven (36 Liters capacity)	01 pc
35.	Water Bath Shaker, Capacity - 250 ml x 6 flasks, Shaking speed range -40-180 strokes per min, Heating - Up to 95°C, Stroke Length - 25 mm, accuracy + 1 C	01 pc
36.	Plant Growth Chamber (20 cu ft, 775 x 900 x 775 mms), Microprocessor based PID Temp. Controller, stainless steel body, Temp. Range is from 5 degree C and to 60 degree C	01 pc
37.	Vortex Mixer , variable speed of 200 to 2500rpm, orbit diameter 4.2mm	01 pc
38.	Microtome Rotary Section thickness setting range - 0.5–60 µm, Section thickness selection from 0.5–2 µm in 0.5 µm-steps; from 2–10 µm in 1 µm-steps; from 10–20 µm in 2 µm-steps; from 20–60 µm in 5 µm-steps; Total horizontal specimen feed 25 mm, Vertical specimen stroke - 59 mm, Specimen retraction on/off, Specimen orientation Horizontal 8°, Vertical 8° Rotation ± 90° Trimming thickness - 10 µm, 50 µm; with blades packet	01 pc
39.	Laboratory Thermometer wall mounted	02 pc
40.	Distillation Apparatus (steel body 4 lit/hour)	01 pc
41.	Compound micro Scope Monocular (Manual), Iron Body 10 x eye piece and objective pieces 4 x, 10 x, 10 x, 100 x	15
42.	Upright Binocular compound Microscope 40-1500x, 10x (F.O.V.: 22mm): eye piece CM type with 90 crosshair and micrometer scale, 360° rotary dial, Quadruple nosepiece fixed to main body, Fine: 0.2mm per rotation; Coarse: 37.7mm per rotation; Minimum reading: 2µm on left-side fine control knob: Coarse motion torque adjustable; illumination- 6V/30W halogen lamp precentered and prefocused; Continuously variable intensity control, Objective Lens - CFI P Achromat 4x, 10x, 20x, 40x, 100x oil for episcopic illuminator	01 pc
43.	Spirit Lamps (SS body)	20 pc
44.	Micrometer and Occular meter (Occular Disc 10 mm)	02
45.	Scissor (Big / Small)	02 pc
46.	Fume Hood (size 6 ft height, 3 x 3 ft), Outer body with sun mica and inner epoxy painted. Working tabletop with acid / alkali resistant tiles, a washbasin with connections for inlet and outlet. The front door movable vertically, fitted with florescent light and a gas cock for gas / air supply	01 pc
47.	Ganong's respirometer (standard glass ISI branded)	03
48.	Glass Retorts	15
49.	Ganongs potometer	03
50.	Anemometer	02
51.	Hygrometer	02
52.	Rain gauge	02
53.	Lux meter	02

**Annexure – I (C) Department of Chemistry:**

Sl.	Name of the Equipment	Quantity
54.	Digital pH, conductivity & temperature meter (digital display, accuracy 0.01 ph mv, tem 0-100 deg c, with electrode sensors)	20
55.	Digital potentiometer ( range: 0 – ± 199.9 mv, 0 – ± 1999mv; resolution -0.1 mv; epeatability ± 1 mv; accuracy- ± 1 mv, ± 1 digit; input impedance- > 1012 ohms; operating temperature- 10 °c – 45 °c; display -3½ digit 0.5" 7-segment led display with auto polarity indication; power -230 v ± 10% ac, 50 hz. With glass electrodes, electrode stand, clamp and dust cover)	05
56.	Rotary flask shaker (25 x 250 ml), table top, shaking speed of approximately 180 rpm	04
57.	Hot plate with magnetic stirrer (stirrers with hotplate, stirring quantity-2 ltr, stirring paddle (ptfe coated), 200 w x 225 d x 185 h in mm, at least 1200 rpm)	05
58.	Hot plate with magnetic stirrer (stirrers with hotplate, stirring quantity-5 ltr, stirring paddle (ptfe coated), at least 1200 rpm)	03
59.	Digital stop watches	10
60.	Stalagmometer curved type borosilicate	20
61.	Stalaganometer straight type - borosilicate	20
62.	Specific gravity bottle with Teflon stopper 50 ml - Borosilicate	20
63.	Photoelectric colorimeter	10
64.	Double distillation plant quartz steel body, 4 l/ hour	01
65.	Water bath shaker, capacity - 250 ml x 6 flasks, shaking speed range -40-180 strokes per min, heating - up to 95°c, stroke length - 25 mm, accuracy + 1 c	04
66.	Thermometer (0 -360 deg c, 2 deg c grading)	40
67.	Graduated pipettes 10 ml (borosil)	40
68.	Pipette volumetric (bulb) 5ml – borosil make	40
69.	Ostwald viscometer	40
70.	Glass / stirring rod 8"	60
71.	Glass rod 10" (10mm)	60
72.	Rubber tubing pressure 8mm dia inner wall thickness 3mm (red) (per 10 mtr) superior quality - . (07964)	10 coil
73.	Hoffman"s pinch clips screw type	50
74.	Electronic weighing balance, accuracy - 0.01 g, capacity upto 500 g, display type- led	05
75.	Separating funnel 200 ml	20
76.	Separating funnels 500 ml	10
77.	Reagent bottles 250 ml	100
78.	Reagent bottles 250 ml	100
79.	Heat calorimeters	20
80.	TLC rectangular tanks 12.1 cm × 10.8 cm × 8.3 cm with lids	20
81.	Double beam UV Spectrophotometer (spectral Bandwidth of <1.8nm, stand-alone instrument: Light Source- Pre aligned Deuterium Lamp (D2) & Tungsten (W) Halogen Lamp; Automatic calibration and programable wavelength for lamp change over; Lamp selection enables conserving the life of the lamps, DETECTOR; Silicon Photo Diode; range 190 to 1100 nm; Bandwidth 1.8 nm; Readability 0.1 nm; Accuracy ± 0.5 nm; Repeatability± 0.2 nm	02
82.	Ninhydrin Sprays	04
83.	Graduated micropipettes (1 ml)	10
84.	Melting point and boiling point apparatus (LCD Display, Temperature Range - +5°C above ambient to 300°C; Temperature Sensor PT100; Temperature Accuracy -± 1°C, +10°C above ambient to 300°C)	02
85.	Acetylation flask 500 ml with condensor	10
86.	Polarimeter device	02
87.	Crucible tongs	50
88.	China dish 200 ml	30

**Annexure – I (D) Department of Physics:**

Sl.	Name of the Equipment	Quantity
89.	1 <sup>st</sup> order High pass filter using Op-amp	02
90.	1 <sup>st</sup> Order Low pass filter using op-amp	02
91.	2 <sup>nd</sup> order High filter using Op-amp	02
92.	2 <sup>nd</sup> order Low pass filter using Op-amp	02
93.	4-Bit comparator using 74LS85	02
94.	4-Bit D/A Converter (R-2R Method)	02
95.	4-Bit D/A Converters (Weighted Resist Method)	02
96.	8 Bit A/D Converter using ADC 0808	02
97.	A to D Converter Trainer	01
98.	A to D converter Trainer with digital meter	02
99.	Adders and Subtractors Trainer	02
100.	Basic Logic Gates using Discrete components	01
101.	Bench top Digital meter DC 20 mA	02
102.	Bench top Digital meter DC 20V	02
103.	BJT Characteristics	02
104.	BJT Characteristics with three meters	02
105.	Cathode Ray Oscilloscope (CRO) – 20MHz Dual Trace	01
106.	CE Amplifier	02
107.	CE Transistor Amplifier Trainer	01
108.	Colpitts Oscillator	03
109.	Common Emitter Amplifier Trainer	02
110.	D to A Converter Trainer	01
111.	D to A Converter Trainer using R-2R ladder network	02
112.	De Morgan's law, Half & Full Adder and Subtractor Trainer	01
113.	Differential Amplifier using op-amp. In Inverting & Non-inverting amplifiers	01
114.	e/m Apparatus C.R.T. mounted on a wooden stand, stand for magnets & Magnetometer box power supply to energies with working manual	01
115.	Energy Band Gap of a Semi conductor with builtin power supply, Thermo-Meter, oven and two digital meters	01
116.	Energy band gap of Junction diode/Thermistor characteristics	02
117.	Experiments with Fiber-Optic kit	02
118.	Figure of Merit of a moving Coil Galvanometer: Ballistic Galvanometer	01
119.	Function Generator (0.1 Hz to 1 MHz)	02
120.	Half and Full adder and subtractor Trainer	02
121.	Hysteresis Loop using CRO – Hysteresis curve Trainer Board with Transformer core	01
122.	Hysteresis Loop using Solenoids – Complete Set	01
123.	Integrator & Differentiator using 741	02
124.	Integrator/Differentiator using op-amp Trainer	02
125.	Inverting & Non-Inverting Amplifier	02
126.	Inverting Amplifier Trainer	02
127.	Inverting Amplifier using Operational Amplifier	01
128.	Junction Diode Characteristics with two digital meters	05
129.	Kirchoffs laws Trainer	03
130.	Lamp & Scale outfit- All metal work on mains through step down Transformer fitted in the base, rack and pinion focus Perspex scale	01
131.	Light Emitting diode characteristics Trainer kit	02
132.	Light Emitting Diode Characteristics with two digital meters	01
133.	Lissajous Figures Trainer Board	01
134.	Logic Gates using Discrete components	02
135.	Logic Gates using ICs	03
136.	Measurement of Numerical Aperture only	01
137.	Measurement of Numerical Aperture Trainer	02
138.	Non-inverting Amplifier using Operational Amplifier	01
139.	Ohm's Law & Kirchoff's Laws	02
140.	Operational Amplifier as Differentiator	01

141.	Operational Amplifier as Integrator	01
142.	Operational Amplifier Trainer	02
143.	Phase Shift Oscillator using op-amp.	02
144.	Planks constant Apparatus (Photo Cell complete set with meters, Power supply and variable source 2 filters	01
145.	PN Junction Diode and Light Emitting Diode	02
146.	Power Factor of an Inductive Circuit	01
147.	RC Coupled Amplifier (Two stage)	02
148.	RC Phase Shift Oscillator	01
149.	RC Phase Shift Oscillator (using transistor)	02
150.	Rectifiers & Ripple Factors	01
151.	Rectifiers and Filters Trainer	02
152.	Semiconductor Devices Trainer	02
153.	Series & Parallel Resonance (LCR) Trainer with one meter	01
154.	Series and Parallel Resonance (LCR) Trainer	02
155.	Series and Parallel Resonance Kit	02
156.	Single Stage RC coupled Amplifier Trainer	01
157.	Solar Cell Characteristics with two digital meters	02
158.	Solar Cell characteristics with two digital meters & with variable light source	01
159.	Stefan's constant by Electrical Method (Trainer Board)	01
160.	Study of Logic Gates and Applications	02
161.	Study of Logic Gates using discrete components	02
162.	Summing Amplifier using Op-Amp. In Inverting & Non-inverting amplifiers	01
163.	Battery Eliminator – output 2,4,6,8,10 & 12 V DC with a rotator Switch in sheet metal box cap. 2 amps	01
164.	Commutator – round four plug key	01
165.	Plug Key – one way plug, brass plugs and lugs fitted on Bakelite Base on wooden block	01
166.	Resistance Boxes: Plug in types, brass plug & lugs, wire wound Resistance adjusted to high accuracies range 1-100 ohm constant coil	01
167.	Thermister Characteristics with oven	03
168.	Lissajous figures using Cathode Ray Oscilloscope	02
169.	Transistor (BJT) Characteristics in CE with four digital meters	01
170.	Transistor (BJT) trainer as various biasing with four digital meters	01
171.	Twin-T Network Trainer	01
172.	Two Port Network parameters	02
173.	Two Stage RC coupled Amplifier	02
174.	Two-Port Network Trainer	01
175.	Wein Bridge Oscillator using 741	02
176.	Wein Bridge Oscillator using op-amp.	03
177.	Zener Diode as Voltage Regulator with two digital meters	01
178.	Zener Diode Characteristics with Meters	02
179.	Zener Diode Characteristics with two digital meters	01
180.	Zener Diode Characteristics with two meters	02
181.	Zener Diode Regulated Power Supply with two meters	02
182.	Zero-crossing detector and comparator	01

Place: Hyderabad  
Date: 02.11.2017

*Sd/-*  
**Registrar**  
Maulana Azad National Urdu University  
Hyderabad

**Annexure-II (i)****Chapter-IV: Technical qualification:**

1.	Name of Printer	M/s.
2.	Details of Tender cost (Non refundable)	Rs. 500/- D.D. No. _____ dated: _____ Bank _____
	<b>Exemption of Tender cost for registering with MSME, NSIC, N.C.C.F, Kendriya Bhandar etc will be considered as per GOI rules on submission of documentary proof.</b>	
3.	Details of EMD : Annexure – I (A) Department of Zoology (refundable)	Rs. 1,15,000/- D.D. No. _____ dated: _____ Bank _____
	Details of EMD Annexure – I (B) Department of Botany (refundable)	Rs. 67,000/- D.D. No. _____ dated: _____ Bank _____
	Details of EMD Annexure – I (C) Department of Chemistry (refundable)	Rs. 22,000/- D.D. No. _____ dated: _____ Bank _____
	Details of EMD Annexure – I (D) Department of Physics (refundable)	Rs. 56,000/- D.D. No. _____ dated: _____ Bank _____
	<b>Exemption of EMD for registering with MSME, NSIC, N.C.C.F, Kendriya Bhandar etc will be considered as per GOI rules on submission of documentary proof.</b>	
4.	Contact Details	Postal Address ..... ..... ..... Tel No. _____ Mobile: _____ E-mail: _____
5.	Details of Registration with GST <i>Enclose Copy / proof</i>	
6.	PAN Details <i>Enclose Copy / proof</i>	
7.	Original Equipment Manufacturer (OEM) authorization certificate specific to this tender (for items nos. 1, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 19, 21, 22, 26, 28, 29, 30, 33, 36, 38, 42, 46, 54, 74, 81.)	
8.	Documentary proof for Pre Qualification Criteria as mentioned in the Tender (Sl. 8, Chapter II) 1) Average turnover for the last 3 years  2) Proof of documents against Chapter-II, Sl.8, b(i) or b(ii) or b(iii)	
9.	Any other relevant information	
-	<b>Optional:</b>	
10.		

**Declaration:** It is hereby declared that the firm have carefully read and understood the tender and **agreed with all the clauses**, terms and conditions of the tender, Hyderabad jurisdiction etc and agreed that the decision of the University shall be final in all respect.

*Authorized signature of  
the firm along with seal*

Place

Date: 2017

**Annexure–II (ii) (A to D)****Chapter–V: Technical bid:****Annexure - II (ii) (A) Department of Zoology:**

Sl.	Name of the Equipment	Quantity	Make & Model	Agreed by the firm (Yes/No)
1.	<b>Lab Microtome</b> (Section thickness - 0.5–60 µm; thickness selection from 0.5–2 µm in 0.5 µm-steps, from 2–10 µm in 1 µm-steps, from 10–20 µm in 2 µm-steps, from 20–60 µm in 5 µm-steps, Total horizontal specimen feed -5 mm, Vertical specimen stroke - 59 mm, Specimen retraction - ON/OFF, Specimen orientation: Horizontal -8°, Vertical - 8°, Rotation - ± 90°, Trimming thickness -10 µm, 50 µm)	01		
2.	<b>Sphygmomanometer</b> (BP meter) clinical grade	02		
3.	<b>CO2 Incubator</b> (Stainless steel body, Range 0 to 20%; CO2 Sensor Technology-IR; Oxygen Control -1 to 20%; O2 Sensor Technology – IR; Relative Humidity Ambient to 95% @ 37°C (98.6°F); Temperature Range (Metric) 5°C above ambient to 55°C; Voltage 230V; CO2 Concentration Control more than ±0.1%; No. of Shelves - 4 standard, dimensions -63.5 x 66 x 100.3cm)	01		
4.	<b>ELISA Reader</b> (Microplate able to read up to 96 wells, wavelength range 400-750 nm with absorbance range 0-3.0 abs, accuracy and linearity 1%, tungsten halogen lamp, five filter capacity with interference of 405, 450, 490, & 630 on filter wheel, display 2x24 digit LCD, extensive on-board data analysis, curve fitting options as linear, cubic, quadratic, cubic spine, point to point assay & control validation, data transformation formulas, cut off & call criteria, memory, parallel centronics for printer, power supply 230 VAC; Washer: Should have processes for full 96 wells, wash cycle 1-10 and wash heads 8 channels with wash protocols. Dispensing volume 1 l, shaking should be use programmable speeds, programmable washing, dispensing, aspiration, rinsing, and priming, built in pumps aerosol cover.)	01		
5.	<b>Western Blotting Apparatus</b> (Mode of Transfer: Semi-Dry: Gel Compatibility- NuPAGE® Gels, Novex® Midi Gels, Novex® Mini Gels; Running Dimension: Horizontal; For Use with (Equipment): Novex® Semi-Dry Blotter; Capacity: Up to 4 mini-gels, Up to 2 midi-gels, Up to 2 E-PAGE gels; Gel Size: Midi (8 cm x 13 cm), Mini (8 cm x 8 cm))	01		
6.	<b>PAGE Unit</b> (Gel Capacity - 1-2 Gels; Number of Gels Max – 2; Number of Gels Min – 1; Operating Temperature 0°C- 45°C; Power <20 W; Total Separation Time -3-5 h; Voltage -500 VDC; Volume Buffer volume:350 ml (Minimum upper buffer volume); 150 ml (Minimum lower buffer volume); 350 ml (Maximum lower buffer volume)	01		
7.	<b>Class II, Type A2 Biological Safety Cabinet</b> - (Long-life ULPA filters for supply and exhaust (per IEST-RP-CC001.3) with 99.999% efficiency for particle size between 0.1 to 0.3 microns; Coved single-piece work surface; One-piece back wall; Microprocessor with LCD display, Quickstart mode, RS 232 data output port, control pad that ADA-compliant., Raised airflow grille,	01		

	antimicrobial coating on all painted surfaces, Night setback mode / standby mode)			
8.	<b>Spectrophotometer</b> (Wavelength range -190 to 1100nm; Spectral bandwidth-1nm (190 to 1100nm); Wavelength display -0.1-nm increments; Wavelength setting 0.1-nm increments (1-nm increments when setting scanning range); Wavelength accuracy- $\pm 0.1$ nm at 656.1nm D2; $\pm 0.3$ nm (190 to 1100nm); Wavelength repeatability $\pm 0.1$ nm; Stray light less than 0.02% NaI at 220nm, NaNO <sub>2</sub> at 340nm; less than 1.0% KC I at 198 nm; Photometric system Double Beam Photometric range Absorbance: -4 to 4 Abs Transmittance: 0% to 400%; Photometric accuracy $\pm 0.002$ Abs (0.5Abs); $\pm 0.004$ Abs (1.0Abs); $\pm 0.006$ Abs (2.0Abs); Photometric repeatability less than $\pm 0.001$ Abs (0.5Abs); less than $\pm 0.001$ Abs (1Abs); less than $\pm 0.003$ Abs (2.0Abs), Baseline stability less than 0.0003 Abs/H at 700nm (one hour after light source turned ON); Baseline flatness within $\pm 0.0006$ Abs ; (190 to 1100nm,one hour after light source turned ON); Noise level Within 0.00005 Abs RMS value (at 700nm)	01		
9.	<b>Gel Documentation System:</b> with provision for Fluorescence; Colorimetry and densitometry and Gel Documentation System; maximum sample size-28 x 36 cm; Maximum image area-19.4 x 26 cm; Excitation source- Epi-white light and trans-UV (302 nm); with trans-white conversion screen and XcitaBlue™ ; UV/blue conversion; Illumination control 3 modes (trans-UV, trans white, epi-white); Detector- CCD; Image resolution- 4 megapixels; Pixel size (H x V)- 4.65 x 4.65 $\mu$ m; Filter holder -3 positions (2 for filters, 1 without filter); Emission filters -1; Dynamic range- >3.0 orders of magnitude; Pixel density (gray levels)- 4,096; Operating voltage 110/115/230 V AC nominal; Operating temperature-10–28°C; Operating humidity- <70% non-condensing; Workflow automated; user selected or recalled by a protocol; Workflow reproducibility -100% repeatability via recallable protocols; with image capture to quantitative analysis and reports; Autofocus (patent pending) Pre-calibrated focus for any zoom setting or sample height ; Dynamic; pre-calibrated and optimized per application; Autoexposure-2 user-defined modes (intense or faint bands)	01		
10.	<b>Sonicator:</b> user-friendly, Full amplitude control from 1-100%; high degree of resolution; efficient settings for processing samples; output up to 700 watts of power, Frequency-20 kHz; Programmability- 10 memories plus sequencing; Programmable Timer- 72 hours; Adjustable Pulse On/Off - 1 second to 24 hours; Voltage -11V, 50/60 Hz, with generator, converter, power cable, wrench set and probes (1 in and 1/8in micro tip)	01		
11.	Haemoglobin meter clinical grade	10		
12.	Water Bath Shaker, Capacity - 250 ml x 6 flasks, Shaking speed range -40-180 strokes per min, Heating - Up to 95°C, Stroke Length - 25 mm, accuracy + 1 C	01		
13.	Upright Binocular compound Microscope 40-1500x, 10x (F.O.V.: 22mm): eye piece CM type with 90 crosshair and micrometer scale, 360° rotary dial, Quadruple nosepiece	01		

	fixed to main body, Fine: 0.2mm per rotation; Coarse: 37.7mm per rotation; Minimum reading: 2µm on left-side fine control knob: Coarse motion torque adjustable; illumination- 6V/30W halogen lamp precentered and prefocused; Continuously variable intensity control, Objective Lens - CFI P Achromat 4x, 10x, 20x, 40x, 100x oil for episcopic illuminator			
14.	Binoculars 10x50 DPS	02		
15.	Field binoculars	15		
16.	Sieves Set from pore size of 150 250 400 1000 microns (brass frame)	1 set		
17.	Magnifying lens (Optical-quality, glass lens with 4X power magnification for high visibility)	06		
18.	Wet and dry thermometers	04		
19.	Digital camera SLR +accessories (20 mega pixels resolution wifi enabled, with zoom 18 x)	01		
20.	Digital cameras with zoom	02		
21.	<b>Incubator BOD</b> (Temperature Range-5 to 60°C; Temperature Accuracy- + / - 0.5°C; Temperature Uniformity-+ / - 0.5°C Power; 220 Volt-Temperature Control microprocessor Control; Steel Powder Coated exterior; Inner Chamber 304 Stainless Steel; Shelves -1 to 5 Stainless Steel, Insulation Polyurethane Foam; Glass Door; Inner Clear Door; Cooling - CFC Free; Refrigerant R134a; Heating System U Shaped S. S. Nichrome Wire Air Heater; Air Circulation - Fan or Blower; with Door Lock; Interior Light; Display-LED / LCD)	01		
22.	<b>Autoclave Thermostat</b> (SS-body), 500X 300 mm & 40 lit; Vertical Size, Load KW: 6(3ph), Lid ring & lid, outer cover	01		
23.	<b>Kymograph</b> (drum type)	02		
24.	Thin layer chromatography plates	02		
25.	UV-protective goggles	04		
26.	Sensitive electronic Balance 0.01 mg to 60 gm, digital display	01		

**Annexure – II (ii) (B) (Department of Botany):**

Sl.	Name of the Equipment	Quantity	Make & Model	Agreed by the firm (Yes/No)
27.	Hot Plate with magnetic stirrer (Stirrers with Hotplate, stirring quantity-2 Ltr, Stirring Paddle (PTFE coated), 200 W x 225 D x 185 H in mm, at least 1200rpm)	01 pc		
28.	Autoclave Thermostat (SS-body), 500X 300 mm & 40 lit; Vertical Size, Load KW: 6(3ph), Lid ring & lid, outer cover	01 pc		
29.	Electronic Weighing Balance, Accuracy - 0.01 g, capacity upto 500 g, Display Type- LED	02 pc		
30.	Deep Freezer (- 25 C to - 5C), 350 lit, vertical type, digital display, accuracy of 1 C.	01 pc		
31.	Steel Lockable Laboratory Storage Cabinets 18"x36"x6', powder coated 18 gauge thickness steel	01 pc		
32.	Steel Laboratory Storage Cabinets 18"x36"x6', powder coated 18 gauge thickness steel (With glass doors)	05 pc		
33.	Table top Centrifuge with 16000 rpm speed, rotors with 2 ml, 15ml/ 50 ml adapters	01 pc		
34.	Microwave Oven (36 Liters capacity)	01 pc		
35.	Water Bath Shaker, Capacity - 250 ml x 6 flasks, Shaking speed range -40-180 strokes per min, Heating - Up to 95°C, Stroke Length - 25 mm, accuracy + 1 C	01 pc		
36.	Plant Growth Chamber (20 cu ft, 775 x 900 x 775 mms), Microprocessor based PID Temp. Controller, stainless steel body, Temp. Range is from 5 degree C and to 60 degree C	01 pc		

37.	Vortex Mixer , variable speed of 200 to 2500rpm, orbit diameter 4.2mm	01 pc		
38.	Microtome Rotary Section thickness setting range - 0.5–60 µm, Section thickness selection from 0.5–2 µm in 0.5 µm-steps; from 2–10 µm in 1 µm-steps; from 10–20 µm in 2 µm-steps; from 20–60 µm in 5 µm-steps; Total horizontal specimen feed 25 mm, Vertical specimen stroke - 59 mm, Specimen retraction on/off, Specimen orientation Horizontal 8°, Vertical 8° Rotation ± 90° Trimming thickness - 10 µm, 50 µm; with blades packet	01 pc		
39.	Laboratory Thermometer wall mounted	02 pc		
40.	Distillation Apparatus (steel body 4 lit/hour)	01 pc		
41.	Compound micro Scope Monocular (Manual), Iron Body 10 x eye piece and objective pieces 4 x, 10 x, 10 x, 100 x	15		
42.	Upright Binocular compound Microscope 40-1500x, 10x (F.O.V.: 22mm): eye piece CM type with 90 crosshair and micrometer scale, 360° rotary dial, Quadruple nosepiece fixed to main body, Fine: 0.2mm per rotation; Coarse: 37.7mm per rotation; Minimum reading: 2µm on left-side fine control knob: Coarse motion torque adjustable; illumination- 6V/30W halogen lamp precentered and prefocused; Continuously variable intensity control, Objective Lens - CFI P Achromat 4x, 10x, 20x, 40x, 100x oil for episcopic illuminator	01 pc		
43.	Sprit Lamps (SS body)	20 pc		
44.	Micrometer and Occular meter (Occular Disc 10 mm)	02		
45.	Scissor (Big / Small)	02 pc		
46.	Fume Hood (size 6 ft height, 3 x 3 ft), Outer body with sun mica and inner epoxy painted. Working tabletop with acid / alkali resistant tiles, a washbasin with connections for inlet and outlet. The front door movable vertically, fitted with florescent light and a gas cock for gas / air supply	01 pc		
47.	Ganong's respirometer (standard glass ISI branded)	03		
48.	Glass Retorts	15		
49.	Ganongs potometer	03		
50.	Anemometer	02		
51.	Hygrometer	02		
52.	Rain gauge	02		
53.	Lux meter	02		

**Annexure – II (ii) (C) Department of Chemistry:**

Sl.	Name of the Equipment	Quantity	Make & Model	Agreed by the firm (Yes/No)
54.	Digital pH, conductivity & temperature meter (digital display, accuracy 0.01 ph mv, tem 0-100 deg c, with electrode sensors)	20		
55.	Digital potentiometer ( range: 0 – ± 199.9 mv, 0 – ± 1999mv; resolution -0.1 mv; repeatability ± 1 mv; accuracy- ± 1 mv, ± 1 digit; input impedance- > 1012 ohms; operating temperature- 10 °c – 45 °c; display -3½ digit 0.5" 7-segment led display with auto polarity indication; power -230 v ± 10% ac, 50 hz. With glass electrodes, electrode stand, clamp and dust cover)	05		
56.	Rotary flask shaker (25 x 250 ml), table top, shaking speed of approximately 180 rpm	04		
57.	Hot plate with magnetic stirrer (stirrers with hotplate, stirring quantity-2 ltr, stirring paddle (ptfe coated), 200 w x 225 d x 185 h in mm, at least 1200 rpm)	05		
58.	Hot plate with magnetic stirrer (stirrers with hotplate, stirring quantity-5 ltr, stirring paddle (ptfe coated), at least 1200 rpm)	03		

59.	Digital stop watches	10		
60.	Stalagmometer curved type borosilicate	20		
61.	Stalagmometer straight type - borosilicate	20		
62.	Specific gravity bottle with Teflon stopper 50 ml - Borosilicate	20		
63.	Photoelectric colorimeter	10		
64.	Double distillation plant quartz steel body, 4 l/ hour	01		
65.	Water bath shaker, capacity - 250 ml x 6 flasks, shaking speed range -40-180 strokes per min, heating - up to 95°C, stroke length - 25 mm, accuracy + 1 c	04		
66.	Thermometer (0 -360 deg c, 2 deg c grading	40		
67.	Graduated pipettes 10 ml (borosil)	40		
68.	Pipette volumetric (bulb) 5ml – borosil make	40		
69.	Ostwald viscometer	40		
70.	Glass / stirring rod 8"	60		
71.	Glass rod 10" (10mm)	60		
72.	Rubber tubing pressure 8mm dia inner wall thickness 3mm (red) (per 10 mtr) superior quality - . (07964)	10 coil		
73.	Hoffman"s pinch clips screw type	50		
74.	Electronic weighing balance, accuracy - 0.01 g, capacity upto 500 g, display type- led	05		
75.	Separating funnel 200 ml	20		
76.	Separating funnels 500 ml	10		
77.	Reagent bottles 250 ml	100		
78.	Reagent bottles 250 ml	100		
79.	Heat calorimeters	20		
80.	TLC rectangular tanks 12.1 cm × 10.8 cm × 8.3 cm with lids	20		
81.	Double beam UV Spectrophotometer (spectral Bandwidth of <1.8nm, stand-alone instrument: Light Source- Pre aligned Deuterium Lamp (D2) & Tungsten (W) Halogen Lamp; Automatic calibration and programable wavelength for lamp change over; Lamp selection enables conserving the life of the lamps, DETECTOR; Silicon Photo Diode; range 190 to 1100 nm; Bandwidth 1.8 nm; Readability 0.1 nm; Accuracy ± 0.5 nm; Repeatability± 0.2 nm	02		
82.	Ninhydrin Sprays	04		
83.	Graduated micropipettes (1 ml)	10		
84.	Melting point and boiling point apparatus (LCD Display, Temperature Range - +5°C above ambient to 300°C; Temperature Sensor PT100; Temperature Accuracy -± 1°C , +10°C above ambient to 300°C)	02		
85.	Acetylation flask 500 ml with condensor	10		
86.	Polarimeter device	02		
87.	Crucible tongs	50		
88.	China dish 200 ml	30		

**Annexure – II (ii) (D) Department of Physics:**

Sl.	Name of the Equipment	Quantity	Make & Model	Agreed by the firm (Yes/No)
89.	1 <sup>st</sup> order High pass filter using Op-amp	02		
90.	1 <sup>st</sup> Order Low pass filter using op-amp	02		
91.	2 <sup>nd</sup> order High filter using Op-amp	02		
92.	2 <sup>nd</sup> order Low pass filter using Op-amp	02		
93.	4-Bit comparator using 74LS85	02		
94.	4-Bit D/A Converter (R-2R Method)	02		
95.	4-Bit D/A Converters (Weighted Resist Method)	02		

96.	8 Bit A/D Converter using ADC 0808	02		
97.	A to D Converter Trainer	01		
98.	A to D converter Trainer with digital meter	02		
99.	Adders and Subtractors Trainer	02		
100.	Basic Logic Gates using Discrete components	01		
101.	Bench top Digital meter DC 20 mA	02		
102.	Bench top Digital meter DC 20V	02		
103.	BJT Characteristics	02		
104.	BJT Characteristics with three meters	02		
105.	Cathode Ray Oscilloscope (CRO) – 20MHz Dual Trace	01		
106.	CE Amplifier	02		
107.	CE Transistor Amplifier Trainer	01		
108.	Colpitts Oscillator	03		
109.	Common Emitter Amplifier Trainer	02		
110.	D to A Converter Trainer	01		
111.	D to A Converter Trainer using R-2R ladder network	02		
112.	De Morgan's law, Half & Full Adder and Subtractor Trainer	01		
113.	Differential Amplifier using op-amp. In Inverting & Non-inverting amplifiers	01		
114.	e/m Apparatus C.R.T. mounted on a wooden stand, stand for magnets & Magnetometer box power supply to energies with working manual	01		
115.	Energy Band Gap of a Semi conductor with builtin power supply, Thermo-Meter, oven and two digital meters	01		
116.	Energy band gap of Junction diode/Thermistor characteristics	02		
117.	Experiments with Fiber-Optic kit	02		
118.	Figure of Merit of a moving Coil Galvanometer: Ballistic Galvanometer	01		
119.	Function Generator (0.1 Hz to 1 MHz)	02		
120.	Half and Full adder and subtractor Trainer	02		
121.	Hysteresis Loop using CRO – Hysteresis curve Trainer Board with Transformer core	01		
122.	Hysteresis Loop using Solenoids – Complete Set	01		
123.	Integrator & Differentiator using 741	02		
124.	Integrator/Differentiator using op-amp Trainer	02		
125.	Inverting & Non-Inverting Amplifier	02		
126.	Inverting Amplifier Trainer	02		
127.	Inverting Amplifier using Operational Amplifier	01		
128.	Junction Diode Characteristics with two digital meters	05		
129.	Kirchoffs laws Trainer	03		
130.	Lamp & Scale outfit- All metal work on mains through step down Transformer fitted in the base, rack and pinion focus Perspex scale	01		
131.	Light Emitting diode characteristics Trainer kit	02		
132.	Light Emitting Diode Characteristics with two digital meters	01		
133.	Lissajous Figures Trainer Board	01		
134.	Logic Gates using Discrete components	02		
135.	Logic Gates using ICs	03		
136.	Measurement of Numerical Aperture only	01		
137.	Measurement of Numerical Aperture Trainer	02		
138.	Non-inverting Amplifier using Operational Amplifier	01		
139.	Ohm's Law & Kirchoff's Laws	02		
140.	Operational Amplifier as Differentiator	01		
141.	Operational Amplifier as Integrator	01		
142.	Operational Amplifier Trainer	02		
143.	Phase Shift Oscillator using op-amp.	02		
144.	Planks constant Apparatus (Photo Cell complete set with meters, Power supply and variable source 2 filters	01		

145.	PN Junction Diode and Light Emitting Diode	02		
146.	Power Factor of an Inductive Circuit	01		
147.	RC Coupled Amplifier (Two stage)	02		
148.	RC Phase Shift Oscillator	01		
149.	RC Phase Shift Oscillator (using transistor)	02		
150.	Rectifiers & Ripple Factors	01		
151.	Rectifiers and Filters Trainer	02		
152.	Semiconductor Devices Trainer	02		
153.	Series & Parallel Resonance (LCR) Trainer with one meter	01		
154.	Series and Parallel Resonance (LCR) Trainer	02		
155.	Series and Parallel Resonance Kit	02		
156.	Single Stage RC coupled Amplifier Trainer	01		
157.	Solar Cell Characteristics with two digital meters	02		
158.	Solar Cell characteristics with two digital meters & with variable light source	01		
159.	Stefan's constant by Electrical Method (Trainer Board)	01		
160.	Study of Logic Gates and Applications	02		
161.	Study of Logic Gates using discrete components	02		
162.	Summing Amplifier using Op-Amp. In Inverting & Non-inverting amplifiers	01		
163.	Battery Eliminator – output 2,4,6,8,10 & 12 V DC with a rotator Switch in sheet metal box cap. 2 amps	01		
164.	Commutator – round four plug key	01		
165.	Plug Key – one way plug, brass plugs and lugs fitted on Bakelite Base on wooden block	01		
166.	Resistance Boxes: Plug in types, brass plug & lugs, wire wound Resistance adjusted to high accuracies range 1-100 ohm constant coil	01		
167.	Thermister Characteristics with oven	03		
168.	Lissajous figures using Cathode Ray Oscilloscope	02		
169.	Transistor (BJT) Characteristics in CE with four digital meters	01		
170.	Transistor (BJT) trainer as various biasing with four digital meters	01		
171.	Twin-T Network Trainer	01		
172.	Two Port Network parameters	02		
173.	Two Stage RC coupled Amplifier	02		
174.	Two-Port Network Trainer	01		
175.	Wein Bridge Oscillator using 741	02		
176.	Wein Bridge Oscillator using op-amp.	03		
177.	Zener Diode as Voltage Regulator with two digital meters	01		
178.	Zener Diode Characteristics with Meters	02		
179.	Zener Diode Characteristics with two digital meters	01		
180.	Zener Diode Characteristics with two meters	02		
181.	Zener Diode Regulated Power Supply with two meters	02		
182.	Zero-crossing detector and comparator	01		

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the firm along with seal*

Place

Date:

2017

**Annexure – III (A to D)****Chapter–VI: Financial bid:** To be utilized by the bidder to quote their prices item wise.**Annexure - III (A) Department of Zoology:**

Sl.	Name of the Equipment	Qty.	Make & Model	Unit cost	GST % and Amount	Total (Including GST)
1.	<b>Lab Microtome</b> (Section thickness - 0.5–60 µm; thickness selection from 0.5–2 µm in 0.5 µm-steps, from 2–10 µm in 1 µm-steps, from 10–20 µm in 2 µm-steps, from 20–60 µm in 5 µm-steps, Total horizontal specimen feed -5 mm, Vertical specimen stroke - 59 mm, Specimen retraction - ON/OFF, Specimen orientation: Horizontal -8°, Vertical - 8°, Rotation - ± 90°, Trimming thickness -10 µm, 50 µm)	01				
2.	<b>Sphygmomanometer</b> (BP meter) clinical grade	02				
3.	<b>CO2 Incubator</b> (Stainless steel body, Range 0 to 20%; CO2 Sensor Technology-IR; Oxygen Control -1 to 20%; O2 Sensor Technology – IR; Relative Humidity Ambient to 95% @ 37°C (98.6°F); Temperature Range (Metric) 5°C above ambient to 55°C; Voltage 230V; CO2 Concentration Control more than ±0.1%; No. of Shelves -4 standard, dimensions -63.5 x 66 x 100.3cm)	01				
4.	<b>ELISA Reader</b> (Microplate able to read up to 96 wells, wavelength range 400-750 nm with absorbance range 0-3.0 abs, accuracy and linearity 1%, tungsten halogen lamp, five filter capacity with interference of 405, 450, 490, & 630 on filter wheel, display 2x24 digit LCD, extensive on-board data analysis, curve fitting options as linear, cubic, quadratic, cubic spine, point to point assay & control validation, data transformation formulas, cut off & call criteria, memory, parallel centronics for printer, power supply 230 VAC; Washer: Should have processes for full 96 wells, wash cycle 1-10 and wash heads 8 channels with wash protocols. Dispensing volume 1 l, shaking should be use programmable speeds, programmable washing, dispensing, aspiration, rinsing, and priming, built in pumps aerosol cover.)	01				
5.	<b>Western Blotting Apparatus</b> (Mode of Transfer: Semi-Dry; Gel Compatibility- NuPAGE® Gels, Novex® Midi Gels, Novex® Mini Gels; Running Dimension: Horizontal; For Use with (Equipment): Novex® Semi-Dry Blotter; Capacity: Up to 4 mini-gels, Up to 2 midi-gels, Up to 2 E-PAGE gels; Gel Size: Midi (8 cm x 13 cm), Mini (8 cm x 8 cm))	01				
6.	<b>PAGE Unit</b> (Gel Capacity - 1-2 Gels; Number of Gels Max – 2; Number of Gels Min – 1; Operating Temperature 0°C-45°C; Power <20 W; Total Separation Time -3-5 h; Voltage -500 VDC; Volume Buffer volume:350 ml (Minimum upper buffer volume); 150 ml (Minimum lower buffer volume); 350 ml (Maximum lower buffer volume)	01				

7.	<b>Class II, Type A2 Biological Safety Cabinet</b> - (Long-life ULPA filters for supply and exhaust (per IEST-RP-CC001.3) with 99.999% efficiency for particle size between 0.1 to 0.3 microns; Coved single-piece work surface; One-piece back wall; Microprocessor with LCD display, Quickstart mode, RS 232 data output port, control pad that ADA-compliant., Raised airflow grille, antimicrobial coating on all painted surfaces, Night setback mode / standby mode)	01				
8.	<b>Spectrophotometer</b> (Wavelength range -190 to 1100nm; Spectral bandwidth-1nm (190 to 1100nm); Wavelength display -0.1-nm increments; Wavelength setting 0.1-nm increments (1-nm increments when setting scanning range); Wavelength accuracy- $\pm 0.1$ nm at 656.1nm D2; $\pm 0.3$ nm (190 to 1100nm); Wavelength repeatability $\pm 0.1$ nm; Stray light less than 0.02% NaI at 220nm, NaNO <sub>2</sub> at 340nm; less than 1.0% KC I at 198 nm; Photometric system Double Beam Photometric range Absorbance: -4 to 4 Abs Transmittance: 0% to 400%; Photometric accuracy $\pm 0.002$ Abs (0.5Abs); $\pm 0.004$ Abs (1.0Abs); $\pm 0.006$ Abs (2.0Abs); Photometric repeatability less than $\pm 0.001$ Abs (0.5Abs); less than $\pm 0.001$ Abs (1Abs); less than $\pm 0.003$ Abs (2.0Abs), Baseline stability less than 0.0003 Abs/H at 700nm (one hour after light source turned ON); Baseline flatness within $\pm 0.0006$ Abs ; (190 to 1100nm,one hour after light source turned ON); Noise level Within 0.00005 Abs RMS value (at 700nm)	01				
9.	<b>Gel Documentation System:</b> with provision for Fluorescence; Colorimetry and densitometry and Gel Documentation System; maximum sample size-28 x 36 cm; Maximum image area-19.4 x 26 cm; Excitation source- Epi-white light and trans-UV (302 nm); with trans-white conversion screen and XcitaBlue™ ; UV/blue conversion; Illumination control 3 modes (trans-UV, trans white, epi-white); Detector- CCD; Image resolution-4 megapixels; Pixel size (H x V)- 4.65 x 4.65 $\mu$ m; Filter holder -3 positions (2 for filters, 1 without filter); Emission filters -1; Dynamic range- >3.0 orders of magnitude; Pixel density (gray levels)- 4,096; Operating voltage 110/115/230 V AC nominal; Operating temperature-10–28°C; Operating humidity-<70% non-condensing; Workflow automated; user selected or recalled by a protocol; Workflow reproducibility -100% repeatability via recallable protocols; with image capture to quantitative analysis and reports; Autofocus (patent pending) Pre-calibrated focus for any zoom setting or sample height ; Dynamic; pre-calibrated and optimized per application; Autoexposure-2 user-defined modes (intense or faint bands)	01				

10.	<b>Sonicator:</b> user-friendly, Full amplitude control from 1-100%; high degree of resolution; efficient settings for processing samples; output up to 700 watts of power, Frequency-20 kHz; Programmability- 10 memories plus sequencing; Programmable Timer- 72 hours; Adjustable Pulse On/Off - 1 second to 24 hours; Voltage - 11V, 50/60 Hz, with generator, converter, power cable, wrench set and probes (1 in and 1/8in micro tip)	01				
11.	Haemoglobin meter clinical grade	10				
12.	Water Bath Shaker, Capacity - 250 ml x 6 flasks, Shaking speed range -40-180 strokes per min, Heating - Up to 95°C, Stroke Length - 25 mm, accuracy + 1 C	01				
13.	Upright Binocular compound Microscope 40-1500x, 10x (F.O.V.: 22mm): eye piece CM type with 90 crosshair and micrometer scale, 360° rotary dial, Quadruple nosepiece fixed to main body, Fine: 0.2mm per rotation; Coarse: 37.7mm per rotation; Minimum reading: 2µm on left-side fine control knob: Coarse motion torque adjustable; illumination- 6V/30W halogen lamp precentered and prefocused; Continuously variable intensity control, Objective Lens - CFI P Achromat 4x, 10x, 20x, 40x, 100x oil for episcopic illuminator	01				
14.	Binoculars 10x50 DPS	02				
15.	Field binoculars	15				
16.	Sieves Set from pore size of 150 250 400 1000 microns (brass frame)	1 set				
17.	Magnifying lens (Optical-quality, glass lens with 4X power magnification for high visibility)	06				
18.	Wet and dry thermometers	04				
19.	Digital camera SLR +accessories (20 mega pixels resolution wifi enabled, with zoom 18 x)	01				
20.	Digital cameras with zoom	02				
21.	<b>Incubator BOD</b> (Temperature Range-5 to 60°C; Temperature Accuracy- + / - 0.5°C; Temperature Uniformity-+ / - 0.5°C Power; 220 Volt-Temperature Control microprocessor Control; Steel Powder Coated exterior; Inner Chamber 304 Stainless Steel; Shelves -1 to 5 Stainless Steel, Insulation Polyurethane Foam; Glass Door; Inner Clear Door; Cooling - CFC Free; Refrigerant R134a; Heating System U Shaped S. S. Nichrome Wire Air Heater; Air Circulation - Fan or Blower; with Door Lock; Interior Light; Display-LED / LCD)	01				
22.	<b>Autoclave Thermostat</b> (SS-body), 500X 300 mm & 40 lit; Vertical Size, Load KW: 6(3ph), Lid ring & lid, outer cover	01				
23.	<b>Kymograph</b> (drum type)	02				
24.	Thin layer chromatography plates	02				
25.	UV-protective goggles	04				
26.	Sensitive electronic Balance 0.01 mg to 60 gm, digital display	01				
<b>Total (Including GST)</b>						

**Annexure – III (B) (Department of Botany):**

Sl.	Name of the Equipment	Qty.	Make & Model	Unit cost	GST % and Amount	Total (Including GST)
27.	Hot Plate with magnetic stirrer (Stirrers with Hotplate, stirring quantity-2 Ltr, Stirring Paddle (PTFE coated), 200 W x 225 D x 185 H in mm, at least 1200 rpm)	01 pc				
28.	Autoclave Thermostat (SS-body), 500X 300 mm & 40 lit; Vertical Size, Load KW: 6(3ph), Lid ring & lid, outer cover	01 pc				
29.	Electronic Weighing Balance, Accuracy - 0.01 g, capacity upto 500 g, Display Type- LED	02 pc				
30.	Deep Freezer (- 25 C to - 5C), 350 lit, vertical type, digital display, accuracy of 1 C.	01 pc				
31.	Steel Lockable Laboratory Storage Cabinets 18"x36"x6', powder coated 18 gauge thickness steel	01 pc				
32.	Steel Laboratory Storage Cabinets 18"x36"x6', powder coated 18 gauge thickness steel (With glass doors)	05 pc				
33.	Table top Centrifuge with 16000 rpm speed, rotors with 2 ml, 15ml/ 50 ml adapters	01 pc				
34.	Microwave Oven (36 Liters capacity)	01 pc				
35.	Water Bath Shaker, Capacity - 250 ml x 6 flasks, Shaking speed range -40-180 strokes per min, Heating - Up to 95°C, Stroke Length - 25 mm, accuracy + 1 C	01 pc				
36.	Plant Growth Chamber (20 cu ft, 775 x 900 x 775 mms), Microprocessor based PID Temp. Controller, stainless steel body, Temp. Range is from 5 degree C and to 60 degree C	01 pc				
37.	Vortex Mixer , variable speed of 200 to 2500rpm, orbit diameter 4.2mm	01 pc				
38.	Microtome Rotary Section thickness setting range - 0.5–60 µm, Section thickness selection from 0.5–2 µm in 0.5 µm-steps; from 2–10 µm in 1 µm-steps; from 10–20 µm in 2 µm-steps; from 20–60 µm in 5 µm-steps; Total horizontal specimen feed 25 mm, Vertical specimen stroke - 59 mm, Specimen retraction on/off, Specimen orientation Horizontal 8°, Vertical 8° Rotation ± 90° Trimming thickness - 10 µm, 50 µm; with blades packet	01 pc				
39.	Laboratory Thermometer wall mounted	02 pc				
40.	Distillation Apparatus (steel body 4 lit/hour)	01 pc				
41.	Compound micro Scope Monocular (Manual), Iron Body 10 x eye piece and objective pieces 4 x, 10 x, 10 x, 100 x	15				
42.	Upright Binocular compound Microscope 40-1500x, 10x (F.O.V.: 22mm): eye piece CM type with 90 crosshair and micrometer scale, 360° rotary dial, Quadruple nosepiece fixed to main body, Fine: 0.2mm per rotation; Coarse: 37.7mm per rotation; Minimum reading: 2µm on left-side fine control knob: Coarse motion torque adjustable; illumination- 6V/30W halogen lamp precentered and prefocused; Continuously variable intensity control, Objective Lens - CFI P	01 pc				

	Achromat 4x, 10x, 20x, 40x, 100x oil for episcopic illuminator					
43.	Sprit Lamps (SS body)	20 pc				
44.	Micrometer and Occular meter (Occular Disc 10 mm)	02				
45.	Scissor (Big / Small)	02 pc				
46.	Fume Hood (size 6 ft height, 3 x 3 ft), Outer body with sun mica and inner epoxy painted. Working tabletop with acid / alkali resistant tiles, a washbasin with connections for inlet and outlet. The front door movable vertically, fitted with florescent light and a gas cock for gas / air supply	01 pc				
47.	Ganong's respirometer (standard glass ISI branded)	03				
48.	Glass Retorts	15				
49.	Ganongs potometer	03				
50.	Anemometer	02				
51.	Hygrometer	02				
52.	Rain gauge	02				
53.	Lux meter	02				
<b>Total (Including GST)</b>						

**Annexure –III (C) Department of Chemistry:**

Sl.	Name of equipment	Qty.	Make & Model	Unit cost	GST % and Amount	Total (including GST)
54.	Digital pH, conductivity & temperature meter (digital display, accuracy 0.01 ph mv, tem 0-100 deg c, with electrode sensors)	20				
55.	Digital potentiometer ( range: 0 – ± 199.9 mv, 0 – ± 1999mv; resolution -0.1 mv; epeatability ± 1 mv; accuracy- ± 1 mv, ± 1 digit; input impedance- > 1012 ohms; operating temperature- 10 °c – 45 °c; display -3½ digit 0.5" 7-segment led display with auto polarity indication; power -230 v ± 10% ac, 50 hz. With glass electrodes, electrode stand, clamp and dust cover)	05				
56.	Rotary flask shaker (25 x 250 ml), table top, shaking speed of approximately 180 rpm	04				
57.	Hot plate with magnetic stirrer (stirrers with hotplate, stirring quantity-2 ltr, stirring paddle (ptfe coated), 200 w x 225 d x 185 h in mm, at least 1200 rpm)	05				
58.	Hot plate with magnetic stirrer (stirrers with hotplate, stirring quantity-5 ltr, stirring paddle (ptfe coated), at least 1200 rpm)	03				
59.	Digital stop watches	10				
60.	Stalagmometer curved type borosilicate	20				
61.	Stalganometer straight type - borosilicate	20				
62.	Specific gravity bottle with Teflon stopper 50 ml - Borosilicate	20				
63.	Photoelectric colorimeter	10				
64.	Double distillation plant quartz steel body, 4 l/ hour	01				
65.	Water bath shaker, capacity - 250 ml x 6 flasks, shaking speed range -40-180 strokes per min, heating - up to 95°C, stroke length - 25 mm, accuracy + 1 c	04				
66.	Thermometer (0 -360 deg c, 2 deg c grading)	40				

67.	Graduated pipettes 10 ml (borosil)	40				
68.	Pipette volumetric (bulb) 5ml – borosil make	40				
69.	Ostwald viscometer	40				
70.	Glass / stirring rod 8"	60				
71.	Glass rod 10" (10mm)	60				
72.	Rubber tubing pressure 8mm dia inner wall thickness 3mm (red) (per 10 mtr) superior quality - . (07964)	10 coil				
73.	Hoffman"s pinch clips screw type	50				
74.	Electronic weighing balance, accuracy - 0.01 g, capacity upto 500 g, display type- led	05				
75.	Separating funnel 200 ml	20				
76.	Separating funnels 500 ml	10				
77.	Reagent bottles 250 ml	100				
78.	Reagent bottles 250 ml	100				
79.	Heat calorimeters	20				
80.	TLC rectangular tanks 12.1 cm × 10.8 cm × 8.3 cm with lids	20				
81.	Double beam UV Spectrophotometer (spectral Bandwidth of <1.8nm, stand-alone instrument: Light Source- Pre aligned Deuterium Lamp (D2) & Tungsten (W) Halogen Lamp; Automatic calibration and programable wavelength for lamp change over; Lamp selection enables conserving the life of the lamps, DETECTOR; Silicon Photo Diode; range 190 to 1100 nm; Bandwidth 1.8 nm; Readability 0.1 nm; Accuracy ± 0.5 nm; Repeatability± 0.2 nm	02				
82.	Ninhydrin Sprays	04				
83.	Graduated micropipettes (1 ml)	10				
84.	Melting point and boiling point apparatus (LCD Display, Temperature Range - +5°C above ambient to 300°C; Temperature Sensor PT100;Temperature Accuracy -± 1°C , +10°C above ambient to 300°C)	02				
85.	Acetylation flask 500 ml with condensor	10				
86.	Polarimeter device	02				
87.	Crucible tongs	50				
88.	China dish 200 ml	30				
<b>Total (Including GST)</b>						

**Annexure – III (D) Department of Physics:**

Sl.	Name of the Equipment	Qty.	Make & Model	Unit cost	GST % and Amount	Total
89.	1 <sup>st</sup> order High pass filter using Op-amp	02				
90.	1 <sup>st</sup> Order Low pass filter using op-amp	02				
91.	2 <sup>nd</sup> order High filter using Op-amp	02				
92.	2 <sup>nd</sup> order Low pass filter using Op-amp	02				
93.	4-Bit comparator using 74LS85	02				
94.	4-Bit D/A Converter (R-2R Method)	02				
95.	4-Bit D/A Converters (Weighted Resist Method)	02				
96.	8 Bit A/D Converter using ADC 0808	02				
97.	A to D Converter Trainer	01				
98.	A to D converter Trainer with digital meter	02				
99.	Adders and Subtractors Trainer	02				
100.	Basic Logic Gates using Discrete components	01				
101.	Bench top Digital meter DC 20 mA	02				

102.	Bench top Digital meter DC 20V	02				
103.	BJT Characteristics	02				
104.	BJT Characteristics with three meters	02				
105.	Cathode Ray Oscilloscope (CRO) – 20MHz Dual Trace	01				
106.	CE Amplifier	02				
107.	CE Transistor Amplifier Trainer	01				
108.	Colpitts Oscillator	03				
109.	Common Emitter Amplifier Trainer	02				
110.	D to A Converter Trainer	01				
111.	D to A Converter Trainer using R-2R ladder network	02				
112.	De Morgan's law, Half & Full Adder and Subtractor Trainer	01				
113.	Differential Amplifier using op-amp. In Inverting & Non-inverting amplifiers	01				
114.	e/m Apparatus C.R.T. mounted on a wooden stand, stand for magnets & Magnetometer box power supply to energies with working manual	01				
115.	Energy Band Gap of a Semi conductor with builtin power supply, Thermo-Meter, oven and two digital meters	01				
116.	Energy band gap of Junction diode/Thermistor characteristics	02				
117.	Experiments with Fiber-Optic kit	02				
118.	Figure of Merit of a moving Coil Galvanometer: Ballistic Galvanometer	01				
119.	Function Generator (0.1 Hz to 1 MHz)	02				
120.	Half and Full adder and subtractor Trainer	02				
121.	Hysteresis Loop using CRO – Hysteresis curve Trainer Board with Transformer core	01				
122.	Hysteresis Loop using Solenoids – Complete Set	01				
123.	Integrator & Differentiator using 741	02				
124.	Integrator/Differentiator using op-amp Trainer	02				
125.	Inverting & Non-Inverting Amplifier	02				
126.	Inverting Amplifier Trainer	02				
127.	Inverting Amplifier using Operational Amplifier	01				
128.	Junction Diode Characteristics with two digital meters	05				
129.	Kirchoffs laws Trainer	03				
130.	Lamp & Scale outfit- All metal work on mains through step down Transformer fitted in the base, rack and pinion focus Perspex scale	01				
131.	Light Emitting diode characteristics Trainer kit	02				
132.	Light Emitting Diode Characteristics with two digital meters	01				
133.	Lissajous Figures Trainer Board	01				
134.	Logic Gates using Discrete components	02				
135.	Logic Gates using ICs	03				
136.	Measurement of Numerical Aperture only	01				
137.	Measurement of Numerical Aperture Trainer	02				
138.	Non-inverting Amplifier using Operational Amplifier	01				
139.	Ohm's Law & Kirchoff's Laws	02				
140.	Operational Amplifier as Differentiator	01				
141.	Operational Amplifier as Integrator	01				
142.	Operational Amplifier Trainer	02				
143.	Phase Shift Oscillator using op-amp.	02				
144.	Planks constant Apparatus (Photo Cell complete set with meters, Power supply and variable source 2 filters	01				
145.	PN Junction Diode and Light Emitting Diode	02				

146.	Power Factor of an Inductive Circuit	01				
147.	RC Coupled Amplifier (Two stage)	02				
148.	RC Phase Shift Oscillator	01				
149.	RC Phase Shift Oscillator (using transistor)	02				
150.	Rectifiers & Ripple Factors	01				
151.	Rectifiers and Filters Trainer	02				
152.	Semiconductor Devices Trainer	02				
153.	Series & Parallel Resonance (LCR) Trainer with one meter	01				
154.	Series and Parallel Resonance (LCR) Trainer	02				
155.	Series and Parallel Resonance Kit	02				
156.	Single Stage RC coupled Amplifier Trainer	01				
157.	Solar Cell Characteristics with two digital meters	02				
158.	Solar Cell characteristics with two digital meters & with variable light source	01				
159.	Stefan's constant by Electrical Method (Trainer Board)	01				
160.	Study of Logic Gates and Applications	02				
161.	Study of Logic Gates using discrete components	02				
162.	Summing Amplifier using Op-Amp. In Inverting & Non-inverting amplifiers	01				
163.	Battery Eliminator – output 2,4,6,8,10 & 12 V DC with a rotator Switch in sheet metal box cap. 2 amps	01				
164.	Commutator – round four plug key	01				
165.	Plug Key – one way plug, brass plugs and lugs fitted on Bakelite Base on wooden block	01				
166.	Resistance Boxes: Plug in types, brass plug & lugs, wire wound Resistance adjusted to high accuracies range 1-100 ohm constant coil	01				
167.	Thermister Characteristics with oven	03				
168.	Lissajous figures using Cathode Ray Oscilloscope	02				
169.	Transistor (BJT) Characteristics in CE with four digital meters	01				
170.	Transistor (BJT) trainer as various biasing with four digital meters	01				
171.	Twin-T Network Trainer	01				
172.	Two Port Network parameters	02				
173.	Two Stage RC coupled Amplifier	02				
174.	Two-Port Network Trainer	01				
175.	Wein Bridge Oscillator using 741	02				
176.	Wein Bridge Oscillator using op-amp.	03				
177.	Zener Diode as Voltage Regulator with two digital meters	01				
178.	Zener Diode Characteristics with Meters	02				
179.	Zener Diode Characteristics with two digital meters	01				
180.	Zener Diode Characteristics with two meters	02				
181.	Zener Diode Regulated Power Supply with two meters	02				
182.	Zero-crossing detector and comparator	01				
<b>Total (Including GST)</b>						

**Declaration:** It is hereby declared that the firm have carefully read and understood the tender and **agreed with all the clauses**, terms and conditions of the tender, Hyderabad jurisdiction etc and agreed that the decision of the University shall be final in all respect

Place:

Date: 2017

*Authorized signature of  
the firm along with seal*