

# VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY: BURLA



P.O: Engineering College Burla (Siddhi Vihar), Dist: Sambalpur  
Odisha– 768018, India

Ref: VSSUT/Chemical/ 7208 /2016

Date: 28 /07/2016

## TENDER CALL NOTICE

Sealed tenders are invited from original manufacturers/authorized dealers for the supply of instruments/equipments for the **Dept. of Chemical Engineering**, VSSUT, Burla, Sambalpur, Odisha. The tenders shall reach the office of the undersigned through **Speed/Registered** post only **on or before 20.08.2016 up to 12.00 Noon.**

For more details, please visit our university website [www.vssut.ac.in](http://www.vssut.ac.in). The authority the reserve right to accept or reject all the tenders without assigning any reason thereof.

Sd/-  
REGISTRAR

No. VSSUT/Chemical/ 7209(6) /2016

Date: 28/07/2016

### Copy to:-

1. M/s Display Lines, 219, Saheed Nagar, Bhubaneswar – 751007 with request to publish the above advertisement in one issue of the “all Odisha daily edition of The Samaja” and “all India edition of The Times of India” at the I & PR approved/lowest rate. The bill may be sent in triplicate along with a copy of the paper in which the publication is made.
2. University Notice Board of VSSUT, Burl a.
3. Dean F & P, with a request to upload the notice & documents in the university.
4. PA to Vice – Chancellor for kind information to Hon’ble Vice – Chancellor.

Sd/-  
REGISTRAR

# VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY: BURLA



P.O: Engineering College Burla (Siddhi Vihar), Dist: Sambalpur

Odisha– 768018, India

Website : [www.vssut.ac.in](http://www.vssut.ac.in), E-mail: [registrar@vssut.ac.in](mailto:registrar@vssut.ac.in), Ph:(0663)2430573,Fax-2430592

Ref: VSSUT/Chemical/ 7208 /2016

Date: 28 /07/2016

## TENDER CALL NOTICE

Sealed Bids (properly stitched separately) in two separate covers (**Technical Bid and Price Bid**) are invited by the “**The Registrar, Veer Surendra Sai University of Technology, Odisha**” from the manufacturers/authorized distributors/ dealers for supply of Instrument and equipment of reputed make (National/ International) for the Department of Chemical Engineering, VSSUT Burla, Odisha. The list of equipments and their technical specifications are mentioned below.

### List of equipments

Sl. No	Description	Quantity	Specifications
1	Jaw Crusher	01	Annexure – VI Table I
2	Roll Crusher	01	
3	Ball Mill	01	
4	Froth Flotation Cell	01	
5	Magnetic Separator	01	
6	Cyclone Separator	01	
7	Plate and Frame Filter Press	01	
8	Balance	01	
9	Rotap Sieve Shaker	01	
10	BSS , Indian & Tyler standard Sieves	01 (each one set)	
11	Wilfley Table	01	

12	Hot Air Oven	01	Annexure – VI Table II	
13	Muffle Furnace	01		
14	Weight Balance	01		
15	Red Wood Viscometer	02		
16	Pen sky Martin Apparatus	02		
17	Bomb Calorimeter automatic	01		
18	Hot Water Bath	01		
19	Engler's Viscometer	02		
20	Abel Open Cup Apparatus	02		
21	Conradson Apparatus	01		
22	Smoke Point Apparatus	02		
23	Pour Point Apparatus	01		
24	pH meter	02		
25	Karl Fisher Titrator	01		
26	Distillation Apparatus	01		
27	Digital Magnetic Stirrer with Hot Plate	01		
28	Junker's Calorimeter	02		
29	Viscometer	01		
30	Bomb Calorimeter Manual	01		
31	Aspen hysis software	01		Annexure – VI Table III
32	Matlab	01		
33	Chemcad	01		

34	UV Visible Spectrophotometer	01	Annexure – VI Table IV
35	Differential Scanning Calorimetric Analyser	01	
36	FTIR analyser	01	Annexure – VI Table V
37	TGA/DTA	01	
38	Bernoulli’s Theorem apparatus	01	Annexure – VI Table VI
39	Discharge through Venturi meter & orifice meter	01	
40	Incubator	01	
41	Millipore water setup	01	
42	Rota evaporator	01	

The Bidders may download the **Tender Documents** directly from the website available at <http://www.vssut.ac.in> and the Tender cost fee of Rs.1000/- + V AT (Non-refundable) by way of separate Demand Draft drawn in favour of “**Veer Surendra Sai University of Technology, Burla**” payable at **SBI, Burla** should be enclosed along with the Bid. The Tender cost fee and the EMD amount should be submitted separately in separate demand drafts. In case of any bid clarification, responsibility lies with the bidders to collect the same from the website and the purchaser shall have no responsibility for any delay/ omission on part of the bidder.

**TIME SCHEDULE:**

- a) Price of bidding document: Rs.1000/- +VAT (Non-refundable)
- b) Date of commencement of downloading bidding document 28.07.2016 at 11.00 AM
- c) Last date and time for Receipt of bids 20.08.2016 up to 12.00 noon
- d) Time and date of opening of Tender & technical bid 26.08.2016 at 11.30 AM
- e) Place of opening of tender and address for communication and receipt of bid documents

**THE REGISTRAR**  
**VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, ODISHA**  
**At- Burla, Po-Burla Engineering College, Dist-Sambalpur-768018,**  
**Tel. No-0663-2430211 Fax No-0663-2430204**

Sd/-  
**REGISTRAR**  
**VSSUT Burla**

# **GENERAL TERMS AND CONDITIONS**

## **GENERAL TERMS & CONDITIONS OF CONTRACT FOR SUPPLY, INSTALLATION AND DEMONSTRATION OF THE INSTRUMENTS AND EQUIPMENTS REQUIRED FOR DEPARTMENT OF CHEMICAL ENGINEERING, VSSUT, BURLA, ODISHA.**

### **1. Document Establishing Bidder's Eligibility & Qualification.**

The Bidders shall furnish as part of the Bid the following Documents establishing Bidder's eligibility and qualification to the Purchaser's satisfaction.

1.1 Manufacturer / Authorized Distributor / Dealer having valid license / certificates for the quoted item and the direct Importers holding valid Import License Manufacturer / Authorized Distributor / Dealer of the product are eligible to participate in the Bid.

1.2 Bidders should have **ISI or equivalent** certification for quoted instruments and equipment. However, the Purchaser shall have the right to consider the items where ISI or equivalent certification is not applicable.

1.3 The Bidder whether manufacturer/ distributor/ dealer must have experience of supply and installation of the quoted items in reputed Government Institutions / Public Undertakings / reputed Private Institutions within India during last preceding 3(Three) years reckoned from the date of bid opening and the details must be submitted along with documentary proof.

1.4 The Bidders shall have to produce document in support of their service associates **nearest to Bhubaneswar/ Sambalpur**, Odisha.

1.5 Bidder shall have to provide operational Training for instruments/equipments to one Official of each consignee at Suppliers Plant or Consignee site **at least for 7 days whichever is suitable to Purchaser.**

1.6 The Bidder shall quote items of one reputed Brand/model with all accessories in complete to perform functionality of Equipment/Instruments.

1.7 Manufacturer has to submit copy of Industry Registration of quoted products and Tax Registration Certificate issued from Competent authority. In case of Authorized Distributor / Dealer/Suppliers have to submit Manufacture authorization along with copy of above

documents of Manufacture Industry.

## **2. Document Establishing Goods Eligibility**

The instruments and equipment offered against the schedule of requirement of instruments, equipment and Machineries should be in accordance with the stipulated specifications and of one reputed brand/model .

2.1 The documentary evidence establishing the brand and the model may be in the form of literature, pamphlets, manuals, drawing, circuit diagram etc.

2.2 Detailed description of instruments and equipment with essential technical and performance characteristics may also be furnished.

2.3 The Bidders should clearly mention in their bid regarding the compatibility of the various equipment or the individual units.

2.4 The quantity shown in the bid can be increased or decreased to any extent depending upon the actual requirement.

2.5 The instruments and equipment should have testing certificate for its satisfactory functioning.

## **3. Technical Bid (COVER - A)**

The following document should be submitted in cover-A.

3.1 Earnest Money Deposit

3.2 Technical details of the equipment and instruments as per **Annexure-V**

3.3 Copy of the manufacturing license/ import license/ Authorized Distributor/ Dealer certificates

3.4 Copy of the authorization from the Manufacturing Company in case of Authorized Distributor /Dealer in **Annexure-III** along with Manufacturer Industry Registration and Tax Registration Certificate.

3.5 VAT/ST clearance certificate up to **date** where applicable.

3.6 Performance/ Market standing certificate establishing that the Bidders have executed supply of similar items as mentioned in Schedule of Requirement of instruments and equipment to

different Govt. Organizations/ Government PSUs / reputed Private Institutions.(proof of documents)

3.7 Copy of the IT PAN Card.

3.8 Detail name, address, telephone no. fax, e-mail of the firm and of the Director/ Managing Director/ Proprietor of the firm (As per **Annexure IV**)

3.9 Address, Telephone No., e-mail, Fax of the Branch Office/ Contact Person/ Liaisoning Office in Odisha. (As per **Annexure IV**)

3.10 Power of Attorney/ Authorization to a person for liaisoning and monitoring the business on behalf of the manufacturer / bidder but not entitled to raise the bills.

3.11 Document if any to establish the reorganization of the manufacturing unit in respect of ISO or equivalent.

3.12 **The original bid document signed & sealed by authorized person in each page as a token of acceptance of all terms and conditions of the tender with original receipt.**

3.13 Documentary evidence establishing that the instruments & equipment and ancillary services to be supplied by the Bidders shall confirm to the Bidding Document

3.14 Any deviation in the specification of the item including standard accessories / optional accessories in complete for functionality of Machine should be marked in **bold letters**.

3.15 Details of foundation drawing for instruments and equipment, if any, should be provided.

3.16 The details of the service station / service associates nearest to Bhubaneswar/Sambalpur shall have to be submitted to qualify in the technical bid.

3.17 Willingness to provide operational Training for Machineries to one Official of each consignee at Suppliers Plant or Consignee site **at least for 7 days whichever is suitable to Purchaser**

#### 4. **Price Bid (COVER – B)**

4.1 The hard copy of price bid giving the rates for various instruments & equipment and other items should be submitted along with sealed soft copy of **price bid in Excel format through CD/Pen drive** both in separate sealed cover here in after called **Cover B (Price Bid). Price**

**Bid (Cover - B)** of the bidders who qualify in **Technical Bid (Cover – A)** will only be opened and will be communicated through **E-mail/Fax**.

- 4.2 The price of the each item shall be quoted as per the prescribed Price Schedule Format at **Annexure-I** along with price break up of custom duty, Excise Duty, CST, Packing, Forwarding and Handling charges, Insurance charges, ET, Freight up to destination including unloading, VAT, commissioning including testing and training with total price per item at **FOR** destination. The bidders are required to submit the individual price of each instrument(s) and equipment(s) as indicated in the schedule of requirements.
- 4.3 Each quoted item and all accessories should cover the warranty / guarantee for **2(two)** year from the date of commissioning (**Annexure-II**).
- 4.4 The **Cover B** of the technically qualifying bidders shall be only opened at the Office of the **“The Registrar, Veer Surendra Sai University of Technology, Burla”** on the date and time to be communicated to them after technical evaluation of **Cover A by E-mail/Fax**.
- 4.5 The cost of standard accessories shall be included in basic price and optional accessories shall have to be quoted separately.
- 4.6 The bidders are required to submit the list of the spare parts required for the machine as well as the list of the dealers/ Distributors of the spare parts nearest to Bhubaneswar, Odisha for its availability.

## **5 BID CONDITIONS**

- 5.1 The bidders should verify the sites of existing laboratories of Department of Metallurgical & Materials Engineering, VSSUT, Burla and the proposed lay out Plan indicating the location of each unit for necessary Technical Evaluation. The scope of Supply as mentioned in the schedule of requirements if not sufficient for full function of the Equipment/instruments should be intimated in writing with the technical bid.
- 5.2 The quoted rate shall not vary with the quantum of order placed or destination point.
- 5.3 A copy of the original bid conditions and the schedules should be signed by the bidder at the bottom of each page with the office seal duly affixed and returned along with the bid. Bid schedule should be duly filled in with an **index** and **page number** for the documents, enclosures & EMD etc. **Paging** must be done for all the documents submitted.

5.4 Bids should be type written or Computerized and every correction/ over writing in the bid should invariably be attested with signature of the bidder with date before submission of the bids to the authorities concerned. No revision of price upward or downward will be allowed once the bid is opened. However the purchaser shall have the right for considering the exchange rate of foreign currencies on verification of documents.

### 5.5 Language of Bid

The Bid prepared by the bidders and all correspondence and document relating to the bid exchanged by the Bidders and the *Purchaser*, shall be written in the English language. Supporting document and printed literature furnished by the Bidders may be written in another language provided they are accompanied by an accurate translation of the relevant passages in the English language in which case, for purposes of interpretation of the Bid, the English translation shall govern.

### 5.6 Bid Price

- The contract shall be for the full quantity as described above. Corrections, if any, shall be made by crossing out, initialing, dating and re-writing.
- All duties, taxes, and other levies payable on the raw materials and components, job contract shall be included in the total price.
- VAT in connection with the sale shall be shown separately.
- The rates quoted by the bidders shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.
- The price shall be quoted in Indian Rupees only.

### 5.7 VAT/ST clearance

Copies of valid VAT clearance Certificates shall be furnished by the Bidders and the originals of the above certificates shall be produced to the purchaser before placement of notification of award if asked for by the Purchaser.

### 5.8 EMD

All bidders are required to submit EMD **not less than 1% of the quoted amount** in shape of **Demand draft** drawn in favour of “**Veer Surendra Sai University of Technology, Burla**” payable at **SBI, Burla** only. The EMD shall be in Indian Rupees.

**NOTE:** Non-submission of EMD or submission of less EMD than the desired one shall result in rejection of Bid. The EMD deposited against other Bids cannot be adjusted or considered for this Bid. No interest is payable on EMD.

## 5.9 SUBMISSION OF BIDS

### **Sealing and Marking of Bids**

Bid should be submitted in two Bid system containing two parts as detailed below.

#### **Sealed Cover-A: Technical Bid.**

#### **Sealed Cover-B: Price Bid (hardcopy & sealed soft copy in CD/pen drive)**

Both the sealed envelopes should then be put in one outer cover and each cover should have the following indication:

- i) Name of Dept.: \_\_\_\_\_
- ii) Reference No of Bid \_\_\_\_\_
- iii) Bid regarding \_\_\_\_\_
- iv) Due date & time for submission of the Bid \_\_\_\_\_
- v) Due date & time for opening of the Bid \_\_\_\_\_
- vi) Name of the Firm \_\_\_\_\_

### **NOTE:**

**A. Bids submitted without following two Bid system procedures as mentioned above will be summarily rejected.**

**B.** Please Note that **prices should not be indicated in the Technical Bid.** The Prequalification document including EMD as required in the Bid document should invariably be accompanied with the Technical Bid (**Cover A**).

The outer envelope shall indicate the name and address of the bidders to enable the bid to be returned unopened in case it is declared “**late**”. If the cover containing the outer envelope is not sealed and marked as required, **Purchaser** will assume no responsibility for the bid’s misplacement or premature opening.

The above procedure shall be adopted both for the Technical bid and price bid separately. Telex, cable, email or facsimile bids will be rejected.

### 5.10 Deadline for Submission of Bids

Bids must be received by the *Purchaser* at the address specified not later than the time and date specified in the Invitation of Bids. In the event of the specified date for the submission of bids being declared a holiday for the *Purchaser*, the bids will be received up to the appointed time on the next working day.

The *Purchaser* may, at its discretion, extend this deadline for submission of bids by amending the bid document, in which case all previous rights and obligations of the purchasers and bidders will remain same till the extended date.

### 5.11 Modification and Withdrawal of Bids

No Modification and Withdrawal of Bids is allowed between the interval of time of submission and the last date and time of the bids.

No bid may be withdrawn in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the bidders on the bid form.

### 5.12 BID OPENING

- The *Purchaser* will open all bids, in the presence of bidder's representatives who choose to attend at **11.30 AM on dated 26.08.2016** at the Office of the **"The Registrar, Veer Surendra Sai University of Technology, Burla"**.
- The bidder's representatives who are present shall sign a register evidencing their attendance. In the event of the specified date of bid opening being declared a holiday for the *Purchaser*, the bids shall be opened at the appointed time and location on the next working day.
- The bidder's names, and the presence or absence of the requisite EMD and such other details as the *Purchaser*, at its discretion, may consider appropriate will be announced at the opening. No bid shall be rejected at bid opening, except for late bids, which shall be returned unopened to the bidders.

### 5.16 Acceptance of the Bid

- Bidders submitting bids would be considered who have considered and accepted all terms and conditions. No enquiries, verbal or written, shall be entertained in respect of acceptance or rejection of the bid.

- Genuine equipment and instrument etc. should be supplied. Bidders should indicate the source of supply i.e. name and address of the manufacturers from whom the items are to be sourced.
- Supply of equipment means – Installation and Commissioning (except civil works), Demonstration as well as Training at site. **No separate charges will be paid on this account.**

#### 5.17 Rejection of the Bid

The Bid document shall be out-rightly rejected under following stipulation and no correspondence will be entertained whatsoever.

- If the Bidders has not furnished the required **Tender paper cost** and **EMD** or EMD exemption certificate from competent authority.
- If the Bidders has not submitted the Price as per the prescribed format **Annexure-I**
- **Manufacturing Authorization Annexure-III and in case of Authorized Distributor / Dealer/Suppliers have to submit Manufacture authorization along with copy of above documents of Manufacture Industry.**
- If the bid is not supplemented with breakup of standard accessories / Optional accessories & cost of AMC separately for three years after completion of warranty period (**In case of major machinery only**).
- Photo copy of the up-to-date valid manufacturing license/ import license (if it is imported) /dealership certificate/Distributor certificate of the product along with Tax registration Certificate of Manufacturer issued from competent authority.
- If the bidders, whether manufacturer or authorized distributor/ dealer have not supplied the required quantity for qualification as per the eligibility criteria and not submitted the performance statement at **Annexure-IV with supporting documents.**
- If the quoted product of the bidders not confirms to technical specification with complete accessories for functional Equipment/Machinery and standard of workmanship required by the Purchaser.
- If the bidder has not furnished technical details of the equipments and machinery with **one make & model** as per **Annexure-V.**
- **If bidder will quote items of more than one make/model.**
- If the bidder has not furnished detailed mandatory drawings, **catalogue/**, Foundation drawings & schedule of supply of items, if required.

- If the bidders have not agreed to give **bid validity**.

#### **5.18 Purchaser's Right to Accept any Bid and to Reject any Bid**

The Purchaser reserves the right to accept or reject any bid and to annul the bidding process and reject all the bids without assigning any reason thereof at any time prior to award of Contract, without thereby incurring any liability to the affected Bidders or Bidders on the grounds of such action of the purchaser. In case no bidder qualifies as per qualifying criteria and standards, purchaser may at his discretion relax qualification criteria for award of contract.

#### **5.19 Evaluation and Comparison of Bids**

The comparison shall be of FOR destination price basis including the price of all costs wherever applicable as well as duties and taxes payable on instruments & equipment incorporated or to be incorporated in the items including the warranty/guarantee period from the date of installation.

- The Purchaser's evaluation of a bid will take into account, in addition to the bid price and the price of incidental services.
- The purpose of bid evaluation is to determine substantially responsive bid with the lowest evaluated cost, but not necessarily the lowest submitted price, which should be recommended for award.
- Evaluation of bids should be made strictly in terms of the provisions in the bid document to ensure compliance with the commercial and technical aspects.
- The past performance of the suppliers will be taken into account while evaluating the bids.
- Cost of the inland transportation, insurance and other costs within the Purchaser's Country incidental to delivery of the goods to their final destination;
- Delivery schedule offered in the bid;
- Deviations in payment schedule from that specified in the General Terms & Conditions of Contract;
- The availability in the Purchaser's country of spare parts and after-sales services for the goods offered in the bid;
- The projected operating and maintenance costs during the life of the equipment/ goods.
- The performance and productivity of the equipment/ goods offered;

- The quality and adaptability of the equipment/ goods offered.
- Any other point as deemed proper to be incorporated by the evaluation committee.
- **Alternative options of offer shall not be allowed.**
- Each Bidder shall submit only one quotation with one make & model.
- The quotation would be evaluated separately for each item
- Sales Tax in connection with sale of goods shall not be taken into account in evaluation.
- Negotiation shall be made with the lowest evaluated bidder.
- Lowest evaluated price shall be taken in to consideration, but not the lowest quoted price.
- Willingness to provide operational Training to one Official of each consignee at consignee site for at least **7 days whichever is suitable to Purchaser.**

## **6.0 Supply Conditions**

### **6.1 Delivery of Goods**

The delivery of goods shall be made by the supplier to the Consignee in accordance to the order placed as shall be detailed in the Schedule of requirements & technical specifications.

### **6.2 Instruments / Equipment Demonstration cum Inspection**

Purchaser reserves the right to ask for demonstration cum inspection of the instruments & equipment where ever applicable.

### **6.3 Inspection/ Test/Training**

The supplier shall get each equipment inspected in manufacturer's works and submit a test certificate (New & Unused) and also guarantee/warranty certificate that the equipment confirms to laid down specifications.

The supplier shall invite the purchaser for pre-dispatch inspection. The Purchaser or his representative shall have the right to inspect/ examine/ test the goods in conformity with the contract awarded/supply order during the production or before dispatch from the manufacturer's premises. Such inspection and clearance will not prejudice the right of the consignee to inspect and test the equipment on receipt at destination.

The inspection/examination/ test may be conducted in the premises of the Supplier or at the goods final destination or at the premises of the consignee, as will be decided by the Purchaser.

The purchaser's right to inspect/ examine/test & where necessary to reject the instruments & equipment after the arrival of the goods at the final destination, shall in no way be limited or waived by the reason of the goods having been inspected and tested by the manufacturer previously. In case of rejection of the goods at the final destination after inspection and test as stipulated above and in case any inspected/ tested goods fail to confirm to the specification/ working condition, the purchaser may reject them and the supplier shall replace/ repair the same free of cost.

#### **6.4 Warrantee Period (comprehensive)**

The Bidders must quote for a minimum period of **2 (Two) years** of comprehensive **warranty** from the date of completion of the satisfactory commissioning as per (**Annexure-II**). This also includes all accessories related to instruments & equipment quoted for.

#### **6.5 Payment Terms**

No advance payment will be made by the Purchaser to the supplier for performance of the contract. 100% of the contract price shall be paid within 30 (thirty) days after satisfactory supply, installation, demonstration, Commissioning & training and stock entry of bills of the goods within due date of delivery.

#### **6.6 Transportation**

The Supplier shall be required to meet all transport and storage expenses until commissioning of the instrument(s) / equipment covered in the contract.

#### **6.7 Taxes and Duties**

The Supplier shall be entirely responsible for payment of all Taxes, Duties etc. incurred until delivery of the contract goods to the Consignee subject to recovery afterwards in the bill as claimed in the Bid offer.

VAT as applicable is payable, to the suppliers of the State of Odisha if claimed in the Bid offer.

VAT/ CST will be paid to the Suppliers of the outside State other than Odisha, if claimed in the Bid offer. Any revision of VAT/ CST shall automatically be taken into account.

**Entry Tax**, if paid by the Supplier, at the local (destination head) Corporation/ Municipality/ NAC is allowed once only on production of money receipt for such payment, if claimed in the Bid offer. Any other statutory levy imposed by the Govt. of India/ Govt. of Odisha from time to time will be considered extra on demand with adequate proof thereof The service tax and the work contract tax shall be levied (Wherever applicable). Income Tax as applicable shall be deducted at source.

## 6.8 Incidental Services

The Supplier shall be required to provide any or all of the following services : (The cost should be included in the quoted Price)

- Furnishing of detailed literature/pamphlets/ circuit diagram/ operation & maintenance manual / drawings (as applicable) for each appropriate unit of supplied goods.
- Furnishing of tools required for assembly and / or maintenance of the supplied goods.
- Performance or supervision of on-site assembly and the supplied goods.
- Performance or supervision or maintenance and/ or repair of the supplied goods, for a period of time agreed by the parties, provided that this service shall not relieve the supplier of any warranty/ guarantee obligations under the contract.
- **Training of the Purchaser's personnel at the Supplier's plant and / or on site, in assembly, start up, operation, maintenance and/ or repair of the supplied goods is Mandatory** .A maintenance contract for the goods supplied, if required by the user beyond the warranty period shall be on mutually agreed upon terms between the user and supplier. The cost of such maintenance contract shall not be included in the Bid cost.

## 6.9 Period of Validity of Bids

- The bid rates should be kept open/ valid for a period of **180** days from the date the Bids are opened.
- A bid valid for a shorter period i.e less than **180** days shall be rejected, as nonresponsive.
- In absence of any indication of the date of validity in the bid, it will be presumed that the offer will remain valid for the minimum period i.e. **180** days as prescribed above.
- In exceptional circumstances the purchaser may solicit the bidders consent for extension of the period of validity. If agreed upon, the bid security so deposited shall also be suitably extended.

#### **6.10 Commissioning Period**

Maximum commissioning period is **30 days** from the date of supply OR **120 days from the date of issue of Purchase Order** failing which the purchaser will have the right to impose penalty for the delay period @ **0.5% per week of the contract value of item/items excluding taxes from the bill amount subject to maximum of 10%**. However Registrar has right to extend the delivery period/commissioning period in special cases.

#### **6.11 Penalty against Non Supply**

In case of non supply of Stores within the due date i.e. within the date of delivery the EMD deposited by the bidder shall be forfeited.

#### **6.12 Rejected items**

No payment shall be made for rejected supplied items. Rejected items must be removed by the bidders within two weeks of the date of rejection at their own cost and replace immediately. In case these are not removed these will be auctioned by the purchaser (at the risk and responsibility of the suppliers) without any further notice.

#### **6.13 Annual Maintenance Contract**

The Cost of Annual maintenance contract for next 3 years after warranty period shall be submitted as per the **Annexure at I(b)** . The after sales service during and after the warranty / guarantee period should be available from companies own engineers.

#### **6.14 Jurisdiction of the Court**

The Purchaser and the Supplier shall agree that the competent Court at Sambalpur shall have the jurisdiction to try and decide anything between the parties and they may approach the Competent Court at Sambalpur if required at any time.

Sd/-  
**REGISTRAR**  
**VSSUT, Burla**

**ANNEXURE-I (a)**

**PRICE SCHEDULE (ITEM WISE) PRICE SCHEDULE (ITEM WISE)**

Item Serial No	Item Description	Country of origin with make & model	Quantity & Unit								
				Exware house/ Ex-showroom/ Off-the-shelf (a)	Excise duty/Custom duty, if any (b)	Packing & Forwarding (c)	Inland transportation, insurance and other local costs incidental to delivery (d)	CST/Entry tax, if any (e)	<b>Unit price</b> (a+b+c+d+e)	<b>VAT (f)</b>	<b>Total Price (a+b+c+d+e+f)</b>

**ANNEXURE-I (b)**

**PRICE SCHEDULE (ITEM WISE) - B**  
**PRICE SCHEDULE FOR ANNUAL MAINTANCE CONTRACT AFTER COMPLETION OF WARRANTY PERIOD.**

Sl.No	Brief description of Goods Total annual	Quantity in nos.				Annual Maintenance Contract cost 3 years i.e. 3x (4a+4b+4c)	
1	2	3	4			5	
			1st yr.	2nd yr.	3rd yr.		
			(a)	(b)	(c)		

\*\* After Completion of warranty period

**Note:-**

1. In case of discrepancy between unit price and total prices, THE UNIT PRICE shall prevail.
2. The cost of Annual Maintenance Contract ( AMC) which includes preventive maintenance including testing & calibration as per technical/ service/ operational manual, labour and spares, after satisfactory completion of warranty period may be quoted for next 3 years on yearly basis for complete equipment and turnkey (if any).
3. The cost of AMC may be quoted along with taxes applicable on the date of bid opening. The taxes to be paid extra, to be specifically stated. In absence of any such stipulation the price will be taken inclusive of such taxes and no claim for the same will be entertained later.
4. Cost of AMC will not be added for Ranking/Evaluation purpose. However, the cost of AMC for lowest evaluated bidder is subject to negotiation.
5. The payment of AMC will be made as per payment terms of the bid document.
6. The uptime warranty and down time penalty shall be as per the bid document.
7. All software update should be provided free of cost during AMC period.
8. The stipulations in Technical Specification will supersede above provisions.
9. The supplier shall keep sufficient stock of spares require during Annual comprehensive Maintenance Contract period. In case the spares are required to be imported, it would be the responsibility of the supplier to import and get them custom cleared and pay all necessary duties.

Place:

Date:

Signature of Bidder  
Business Address  
Seal of the Bidder

## **ANNEXURE - II**

### **WARRANTY MAINTENANCE CONTRACT AGREEMENT.**

THIS AGREEMENT made the.....day of ....., 20\_\_\_ between the “**The Registrar, Veer Surendra Sai University of Technology, Burla**” (hereinafter "the Purchaser") of the one part and M/s..... (here in after called "the Supplier") of the other part:

WHEREAS the Purchaser invited bids for certain Goods & ancillary services viz, supply and commissioning of the instruments & equipment at Bhubaneswar including Comprehensive Warranty Maintenance Services and has accepted a bid by the Supplier for the instruments & equipment specified below at the Consignee site including Comprehensive Warranty maintenance Services for a period of 2 (Two) year from the date of installation & commissioning of the instruments & equipment as per award of Contract No..... dated

#### **Name of the Equipment & machineries Qty**

(To be filled in as per details of goods in the award of Contract)

#### **NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:**

1. Maintenance Services shall consist of Preventive and Corrective maintenance of equipment specified above & will include repair and replacement of parts free of cost.
2. Preventive maintenance, monthly once, which includes:
  - 2.1 Check-up to ensure that device connection is proper, cabling is at proper condition etc.
  - 2.2 Cleaning of the above instruments & equipments and checking the System Performance.
3. The Supplier is to furnish the tentative schedule of the preventive maintenance of Warranty Maintenance Contract (WMC) to be carried out.
- 4 The parts replaced must be new parts or equivalent in performance to new parts.
5. The Supplier will also provide the same maintenance service in case of the movement of equipment from the place of original installation to a different place or location, if the equipment is shifted by the Purchaser to another place or location at the cost and risk of the purchaser.
6. Any complaint informed through telephone must be acknowledged with a Complaint No. by the Supplier which will be noted by Consignee. All further contact with the Supplier on such complaint will be initiated through that Complaint No. Once rectification done, that No. will be cancelled by both parties. A register is to be maintained by the Supplier where complaints are to be noted along with Complaint No.
7. The maintenance shall normally be done at the earliest.

8. The Service Engineer of the Supplier will be allowed to handle the respective plant & machineries only in presence of the officer in charge at the Consignee site.
9. The Supplier should ensure that maintenance job is not hampered/delayed due to paucity of spares/inadequate manpower etc.
10. The Supplier should submit the services call report, to the Consignee for each and every service call without fail.
11. The Supplier evaluation data format for the WMC of Consignee systems may be filled up for necessary action.
12. All formats after filled up should be signed at the end of each page by the Supplier.
13. After completion of the work/repair/maintenance, the Purchaser shall issue a certificate of completion to the supplier to that effect.

Signature

Signature

For the Purchaser

For the Supplier

Name:

Name:

Designation:

Designation:

Address:

Address:

Telephone No:

Telephone No:

**ANNEXURE-III**

**MANUFACTURES' AUTHORISATION FORM**

No. \_\_\_\_\_ / Date \_\_\_\_\_ /

To

The Registrar,  
VSSUT Odisha  
Burla, Sambalpur.

Dear Sir, Bid No. \_\_\_\_\_

We \_\_\_\_\_ who are established and reputable manufacturers of \_\_\_\_\_ having factories at \_\_\_\_\_ (Address of Factory) do thereby authorize M/s. \_\_\_\_\_ (Name and address of Agent) to submit a bid and sign the contract with you against the above bid.

\* No company or firm or individual other than M/s. \_\_\_\_\_ are authorized to bid and conclude the contract in regard to this business against this specific invitation for bid.

We hereby extend our full guaranty and warranty as per general conditions of contract for the goods and services offered by the above firm against this bid.

Yours faithfully,  
(Signature for and on behalf of Manufacturers)

Note: This letter of authority should be on the letterhead of the manufacturer and should be signed by a person, competent and having the power of attorney to bind the manufacturer. It should be included original by the Bidders in its bid.

- This para should be deleted for simple items where manufacturers sell the product through different stockiest.
- The Supplier/Managing Director of the Company (if the supplier is a Company) or the Power of Attorney Holder having specific power to sign the contract can only sign the contract/execute the agreement.

**ANNEXURE-IV**

**DETAILS OF THE BIDDERS**

Bid Reference No.

Name and address of the Bidder:

01 Name of the bidder

- a) Full postal address
- b) Full address of the premises
- c) Telegraphic address
- d) Telephone number
- e) Fax number
- f) E mail:
- g) PAN No
- h) TIN No

02 Total annual turn-over (value in Rupees)

03 Quality control arrangement details

04 Test certificate held

- a) Type test
- b) BIS/ISO certification
- c) Any other

05 Details of staff

- a) Technical
- b) Skilled
- c) Unskilled

06 Branch Office/ Contact Person/ Liaisoning Office in Odisha.

- a) Address
- b) Telephone No.
- c) e-mail,
- d) Fax

Signature and seal of the Bidder

**ANNEXURE-V**

**Technical details of the Machineries & Equipments to be supplied by the bidder**

<b>Bid SI No. of the item</b>	<b>Tender specification</b>	<b>Bidders Specification with make and model no (Enclose manufactures catalogue / brochure for each item)</b>	<b>Deviation if any With university specification</b>

Signature and seal of the Bidder

THE LISTS OF EQUIPMENTS OF CHEMICAL ENGINEERING DEPARTMENT ARE AS FOLLOWS.

<b>TABLE-I (LIST OF EQUIPMENTS OF MATERIAL HANDLING LABORATORY)</b>																																															
<b>EQUIPMENT SPECIFICATIONS</b>																																															
<b>S.NO</b>	<b>Name of the Equipment/Setup</b>	<b>Technical Specifications</b>																																													
1	Sieve Set	<p>As per ASTM 11-09 standard specification.</p> <p>Standard test sieves of 200 mm (8 in) dia. and 50 mm (2 in) height with brass sieves with the following standard openings.</p> <p>British std. Indian std. Tyler std.</p> <table border="0"> <tr> <td>4</td> <td>4.000</td> <td>4</td> </tr> <tr> <td>8</td> <td>2.000</td> <td>8</td> </tr> <tr> <td>16</td> <td>1.000</td> <td>16</td> </tr> <tr> <td>22</td> <td>0.710</td> <td>22</td> </tr> <tr> <td>30</td> <td>0.500</td> <td>30</td> </tr> <tr> <td>52</td> <td>0.300</td> <td>52</td> </tr> <tr> <td>72</td> <td>0.212</td> <td>72</td> </tr> <tr> <td>85</td> <td>0.180</td> <td>85</td> </tr> <tr> <td>100</td> <td>0.150</td> <td>100</td> </tr> <tr> <td>150</td> <td>0.106</td> <td>150</td> </tr> <tr> <td>200</td> <td>0.075</td> <td>200</td> </tr> <tr> <td>300</td> <td>0.053</td> <td>300</td> </tr> <tr> <td>350</td> <td>0.045</td> <td>350</td> </tr> <tr> <td>400</td> <td>0.037</td> <td>400</td> </tr> <tr> <td></td> <td>Receiver pan+ Lid</td> <td>-</td> </tr> </table>	4	4.000	4	8	2.000	8	16	1.000	16	22	0.710	22	30	0.500	30	52	0.300	52	72	0.212	72	85	0.180	85	100	0.150	100	150	0.106	150	200	0.075	200	300	0.053	300	350	0.045	350	400	0.037	400		Receiver pan+ Lid	-
4	4.000	4																																													
8	2.000	8																																													
16	1.000	16																																													
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30	0.500	30																																													
52	0.300	52																																													
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300	0.053	300																																													
350	0.045	350																																													
400	0.037	400																																													
	Receiver pan+ Lid	-																																													
2	Sieve shaker	<p>Sieve assembly: Compatible to sieves of 10-20 mm dia (5-6 sieves).</p> <p>Drive: By FHP motor.</p>																																													

		<ul style="list-style-type: none"> <li>• Control panel should consist of Standard make on-off switch, mains indicator.</li> <li>• The whole set up should be well designed and arranged on a rigid structure.</li> <li>• Special arrangement for settling time for shaking.</li> <li>• An English instruction manual consisting of experimental procedure, Block diagrams should be provided along with apparatus.</li> </ul>
3	Jaw crusher	<p>Jaws - Manganese Steel</p> <p>Jaw Size – 6’’× 8’’</p> <p>Feed Size – 3-5’’</p> <p>Product Size – 10mm -20mm Motor Capacity = 5 HP, 3 phase Capacity 300 kg/h.</p> <ul style="list-style-type: none"> <li>• An English instruction manual consisting of experimental procedure, Block diagrams should be provided along with apparatus.</li> <li>• The whole set up should be well designed and arranged on a rigid structure</li> </ul>
4	Roll crusher	<p>Rolls Material Chilled steel, Dia100-200mm, width 50-100mm approx.</p> <p>Max feed Size 6-10mm</p> <p>Product Size- 1-2mm</p> <p>Feed hopper: Suitable capacity.</p> <p>Drive: 2HP motor coupled with reduction gear box.</p> <ul style="list-style-type: none"> <li>• Control panel should consist of electronic energy meter, starter and an MCB.</li> <li>• The whole set up should be well designed and arranged on a rigid structure.</li> <li>• An English instruction manual consisting of experimental procedure,</li> </ul>

		block diagrams should be provided along with apparatus.
5	Ball Mill	<p>Material MS, Dia 250-275mm,  Length 300-350 mm, thickness 4-5 mm.  Discharge suite: Suitable size.  Feed size 4-6mm approx.  Product size: 200 mesh approx. Drive: 1/2HP motor coupled with reduction gear box.  Product receiver: Material SS of suitable size.  Revolution counter: Mechanical type.</p> <ul style="list-style-type: none"> <li>• The whole set up should be well designed and arranged on a rigid structure.</li> <li>• An English instruction manual consisting of experimental procedure, block diagrams should be provided along with apparatus.</li> </ul>
6	Plate and Frame filter press	<p>No of frames: 4-6  No of plates: 5-7  Size: 200 mm×200 mm  Material: Acrylic  Filter medium :Filter cloth  Filtrate collecting tray: Material SS suitable size.  Slurry feed tank: Material SS capacity 20-40 Ltrs.  Slurry tank agitator: SS impeller with SS shaft coupled to motor and reduction gear box.  Slurry feed pump: Gear pump with motor.  Piping system: GI and PVC.  Filtration rate measurement: Using measuring tank, Material SS.  Pressure measurement: Bourden type pressure measurement.  Overhead water tank: Material SS, Capacity 20-25 Ltrs.</p>

		<ul style="list-style-type: none"> <li>• Control panel should consist of Standard make on-off switch, mains indicator.</li> <li>• The whole set up should be well designed and arranged on a rigid structure.</li> <li>• An English instruction manual consisting of experimental procedure, block diagrams should be provided along with apparatus.</li> </ul>
7	Froth Flotation Cell	<p>Floatation chamber: Material SS, compatible capacity</p> <p>Agitator: Stainless steel impeller with SS shaft coupled to motor.</p> <p>Diffuser: Material SS holding the impeller.</p> <p>Froth collecting tank: Material SS, Capacity 10-20 Ltrs</p> <ul style="list-style-type: none"> <li>• Control panel should consist of Standard make on-off switch, mains indicator.</li> <li>• The whole set up should be well designed and arranged on a rigid structure.</li> <li>• An English instruction manual consisting of experimental procedure, block diagrams should be provided along with apparatus.</li> </ul>
8.	Wilfley table	<p>Size: 1' width x 4' length</p> <p>Capacity: 50 to 250 kg/hr</p> <p>RPM: 250 to 350</p> <p>Amplitude: 5 mm to 13 mm</p> <p>Motor: 0.75 hp/415 v/3 ph/50 cycles/1440 rpm/TEFC (Totally enclosed fan-cooled)</p>
9	Magnetic separator	<p>Belts: Width 100-150 mm, Length 400-500 mm.</p> <p>Feed hopper: Material SS, suitable capacity (continuous vibrating).</p> <p>Drive: Motor with reduction gear box.</p> <p>Magnets: Permanent magnets kept in a SS</p>

		<p>chamber.</p> <p>Collecting Bins: 2 Nos one for magnetic and other for non-magnetic material.</p> <ul style="list-style-type: none"> <li>• Control panel should consist of Standard make on-off switch, mains indicator.</li> <li>• The whole set up should be well designed and arranged on a rigid structure.</li> <li>• An English instruction manual consisting of experimental procedure, block diagrams should be provided along with apparatus.</li> </ul>
10	Balance	Weight:0.001-5 kg
11	Cyclone separator	<p>Material Stainless steel, Dia.: 50-100 mm</p> <p>Solid discharge silo: Material Stainless steel, suitable capacity with discharge control valve.</p> <p>Blower: ID Fan blower with 1 HP provided motor.</p> <p>Air flow measurement: Flow meter with manometer.</p> <p>Solids collector: Transparent PVC controller fixed with cyclone.</p> <p>Fine dust collector: Bag of nylon cloth fixed on exit of air.</p> <ul style="list-style-type: none"> <li>• Control panel should consist of Standard make on-off switch, mains indicator.</li> <li>• The whole set up should be well designed and arranged on a rigid structure.</li> <li>• An English instruction manual consisting of experimental procedure, Block diagrams should be provided along with apparatus.</li> </ul>

**TABLE-II (LIST OF EQUIPMENTS OF FUEL TECHNOLOGY LABORATORY)  
EQUIPMENT SPECIFICATIONS**

S.NO	Name of the setup	Technical Specifications
1	Hot air oven	Temp. range up to 300°C, Heating rate of 5-50°C /min, Accuracy 1°C, Material: Made up of Stainless steel with 3 shells with provision of air flow rate or cooling
2	Muffle furnace	Max. temp. 1200°C , Heating rate 50-100°C /min, Accuracy 1-5°C, Heating Zone area: 15×30 cms, Controller type :PID Provision for air cooling, Supported with wheel stand
3	Weight balance	Range 0.0001 – 500 g , Accuracy: 0.001 g
4	Red Wood Viscometer	Liquid Flow: 15-2500 sec. Stain less steel bath with electrical heating arrangement and controlled by digital temperature controller com indicator. The apparatus comprises tap, silver plated steel jet, and cup cover with precision stainless steel jet, cup cover, ball valve, thermometer clip, stirrer and M.S sheet stand with levelling screws. The temperature should uniformly distributed throughout the chamber by stirrer. Suitable to operate on 220 volts, single phase, 50 Hz.
5	Pen sky – Martin apparatus	ASTMD-93 and IS 1448 (Part D)1270 (P.21) and IS 1209-1953 method B. Used for finding out Flash Point above 700 C and below 3000 C. The Instrument having Oil Test Jet/Gas Test Jet Flame Device, stirrer with flexible shaft. The Assembly rests in Air Bath which is covered with Dome shape metal top. The cup is fitted with insulated Handle and locking arrangement near Cup flange. The assemble should be kept on round shape

		electric heater with Separate temp regulator. Suitable for operation on 220 Volts 50 cycles AC Circuits.
6	Fully Automatic Bomb Calorimeter	<ol style="list-style-type: none"> <li>1. Micro processor based</li> <li>2. Automatic measuring and calculation of calorific value/water equivalent</li> <li>3. Big LCD Display</li> <li>4. In built printer</li> <li>5. 16 soft touch keypad</li> <li>6. Weight of tablet feedable</li> <li>7. Water equivalent feedable</li> <li>8. Full test report printout with date and time</li> <li>9. Temperature scanning resolution of 0.01°C</li> <li>10. Alarm on firing and after the test completes.</li> <li>11. Sensor open detection</li> <li>12. No paper or printer door open detection</li> <li>13. User interaction messages on LCD.</li> <li>14. Type of test selectable</li> <li>15. Memory storage for date.</li> <li>16. Real time clock.</li> <li>17. Internal data Logger with computer interface</li> <li>18. PC software for data record</li> <li>19. Soft power ON for full system</li> </ol>
7	Hot water bath	Water bath rectangular thermostatic (double walled) with 12 holes and with digital temp. Indicator
8	Engler's viscometer	As per IP 212 and ASTM D-490. Device should be mounted on a stand, a thermometer clip to the water bath and the oil cup lid should have a thermometer socket Heater specifications: 500 W, the bath should be

		fitted with 500W heater and can be operated at 220 Volts AC main. It consists of SS water bath with double walled lid and stirrer.
9	Abel open cup apparatus	This apparatus is used for determining the close cup flash point of petroleum and mixtures according to IP 33 and IP 170 and also IS 1448 (Part I) 1985 (P: 20). It should be suitable for oils which flash below 700° C. It should be supplied with oil cup, cover fitted with stirrer, thermometer socket S.S. Water Bath, Stand. An electric heater should be fitted at bottom for operation on 220 Volts AC Circuits. Elect. Driven Stirrer (170 R.P.M.)
10	Carbon Residue Apparatus (conradson apparatus)	It should be made as per IP 13, ASTM D- 189 Specifications. It is useful to determine amount of Carbon Residue when the oil is evaporated under Specified Conditions. The apparatus consists of spun sheet iron crucible 25 cc Capacity, Sheet Iron hood and sheet iron block on a stand, gas Burner.
11	Smoke Point Apparatus	Smoke Point Apparatus as per IP 57 & IS 1448 (P-31) & ASTM D 1322 <b>172 a</b> Spare Candle <b>172 b</b> Spare Wick. Sturdy construction with superior dimensional stability, equipped with cured glass window to aid smoke detection, Maintenance free, light weight construction, Testing apparatus: Made up of brass, Scale: made up of glass, stand made up of cast iron and a iron shaft rod.
12	Pour point apparatus	This should be made according to specification laid by IP15 & IS 1448 (P :10) 1970. The pour point is lowest temperature at which the oil will just fail to flow. The apparatus Consists main cooling bath made out of S.S. sheet and stand unit

		with drain plug and cover has provision for fitting thermometer and a filling aperture for adding freezing mixture. A Glass jar for containing oils, Jacket, disc and gasket as specified are also provided.
13	pH meter	Cyber scan pH Tutor Meter with indigenous refillable glass pH electrode IND786, BNC connector, 1m cable length, indigenous electrode stand and power adapter. ATC probe should be supplied.
14	Karl Fisher Titrator	<ol style="list-style-type: none"> <li>1. Special titration mode with the function of pre-titration, pre-setting terminal titration, empty terminal titration or manual titration.</li> <li>2. The meter should be used to make acid and alkali titration, oxidation-reduction titration, Precipitation titration, Complex titration and non aqueous titration etc., as well as pH measurement.</li> <li>3. Electricity cutting off protection.</li> <li>4. With Rs-232 interface ( ModelTP-16, TP-24 and TP-40) printers can be connected.</li> <li>5. The computer communicating software is provided with the meter, titrating tension, one step and two steps derivative and graphs contrast analysis are instantly displayed on computer. Titration mode can be compiled and revised. The meter can be remote controlled. The results of the measurement can also be counted up.</li> <li>6. Titration system made of perchloric acid resistant materials to make no aqueous titration possible.</li> </ol> <p><b><u>Specification</u></b></p> <ol style="list-style-type: none"> <li>1. Measurement range :pH:0.00-14.00pH, mV: 0±1400.0mV</li> <li>2. Resolution:pH0.01pH,mV:1mV</li> <li>3. Accuracy of the electric unit:pH:±0.01pH±1bit, mV:±0.6mV, temperaturure: ±0.3°C</li> <li>4. Stability:±0.3mV±1bit/3h</li> <li>5. Control titration Sensitivity:±2mV</li> <li>6. Titration tube capacity error:10ml tube:±0.025ml, 20ml tube: ±0.035ml</li> <li>7. Capacity analysis reproducibility:0.2%</li> </ol>

15	Distillation apparatus	<p>As per ASTM standard to distillate the petroleum fractions:</p> <p>Temperature room temp. : 350<sup>0</sup>C</p> <p>b) Temperature controlled by energy regulator or Voltage Variac.</p> <ul style="list-style-type: none"> <li>• A 100ml sample should be distilled under prescribed conditions which are appropriate to its nature.</li> <li>• 16 distillation of petroleum products as per ASTM D 86 should be used by both gas and electrical heating.</li> <li>• Distillation unit for gas or electric heating, draught shield with toughened glass window, front opening, levelling support for heat resistant board, and drilled for fitting electrical heater, available separately if required, for left or right hand side operation.</li> <li>• This unit should be consist of one heating shield with gas or electric heating with control, one Stainless Steel cooling with drain valve and condenser with top cover, Stand to hold the cooling bath, one cylinder, one distillation flask, two silicon cork one for side arm and one for top thermometer, two asbestos pad of diameter 37.5mm and 50mm.</li> <li>• The supply should be 230 V ac, 50 hz, 6 A Total load.</li> <li>• Size of the Heating Unit is approximately 470mm X 200mm X 200mm. &amp; weight 8 Kg.</li> <li>• Size of the condenser Unit is 330mm X 450mm X 185 mm with weight 5.0 Kg.</li> </ul>
16	Digital Magnetic stirrer with hot plate	Digital Magnetic stirrer with hot plate, ceramic top, acid/alkali proof, digital speed control from

		100-1200 rpm. 18 cm X 18 cm.
17	Junkers calorie meter apparatus	<p>Measuring range: 100Kcal/m<sup>3</sup>-30000 Kcal/m<sup>3</sup> of fuel, Gases at low pressure: 1-15w.g.</p> <ul style="list-style-type: none"> <li>• Equipment consists of powder coated SS exterior with burner (with choice of 2 nozzles) on a tripod stand, a gas flow meter and pressure governor.</li> <li>• Used to determine the calorific value of gas.</li> <li>• The Calorimeter mainly consists of a gas combustion chamber, heat exchanger and water flow system.</li> <li>• Heat exchanger is fabricated out of heavily tinned copper sheet. A constant water head maintenance device provided in the feed water pipe along with the inlet water flow regulator is fixed to the outer housing of the Calorimeter. The outer housing is of powder coated SS</li> </ul>
18	Viscometer	<ul style="list-style-type: none"> <li>➤ The viscosity of liquid samples will be measured</li> <li>➤ All necessary attachments should be provided at the time of installation</li> <li>➤ Type: Capillary viscometer</li> <li>➤ Range of viscosity: more than 11,000 mPa</li> <li>➤ Temperature range: 10-90 °C</li> <li>➤ Required to determine the viscosity of petroleum products: especially oil</li> <li>➤ Demonstration of the equipment should be given</li> <li>➤ Computers is required if necessary</li> <li>➤ Capillary type or any types of viscometer</li> </ul>

		which can measure the viscosity of fuel oil
19	Bomb Calorimeter Manual	<p>As per BS-1016-part 5 (1967), BIS-1350 part 2 and IP – 1263T used generally to determine the calorific value of coal and petroleum products .</p> <p>The Bomb calorimeter should be of isothermal type made up of stainless steel , inner and outer vessel should be of stainless steel and supplied with stainless steel bomb of 316 grade, capacity 300 ml , non returning valve, electrode pole firing, crucible holder, crucible of stainless steel, tripod stand, bomb head support, motorized stirrer by pure AC motor with rubber belt and pulley or fully built in type motor with straight stirrer, pallet press, pressure gauge with oxygen control cock, copper pipe, nicrome wire 40 SWG</p> <p>, Digital display Beckman thermometer of 0.1 deg. Division, water jacket. Complete Digital with 0.01 deg C readout. Along with O<sub>2</sub> filled gas cylinder of capacity 10 litres.</p> <p>All the necessary equipment required for smooth running.</p> <p>Demonstration should be given after installation.</p>

<b>TABLE-III (LIST OF EQUIPMENTS OF COMPUTER AIDED DESIGN LABORATORY)</b>		
<b>EQUIPMENT SPECIFICATIONS</b>		
<b>S.NO</b>	<b>Name of the setup</b>	<b>Technical Specifications</b>
1	Aspen Hysis	Single user
2	Matlab	Single user
3	Chemcad	Single user

**TABLE-IV (LIST OF EQUIPMENTS OF PROCESS TECHNOLOGY LABORATORY)  
EQUIPMENT SPECIFICATIONS**

S.NO	Name of the setup	Technical Specifications
1.	UV-Visible Spectrophotometer	<ol style="list-style-type: none"> <li>1. Liquid samples will be analyzed</li> <li>2. Lamp Source: Tungsten / Deuterium Lamp</li> <li>3. Monochromator: Blazed holographic grating with 1200 lines per mm, Czerny-Turner with 0.2m focal length or better technology</li> <li>4. Wavelength Range: 100-1000 nm or better</li> <li>5. Spectral Bandwidth: 0.5, 1, 2, 5, 20 nm variable or better</li> <li>6. Wavelength Accuracy: <math>\pm 0.1</math> nm or better</li> <li>7. Photometric Range: <math>\pm 4A</math> or better</li> <li>8. Wavelength Reproducibility: <math>\pm 0.1</math> nm or better</li> <li>9. Detector: Silicon Photodiode, Diode array detector (DAD, PDA: Photodiode Array Detector (any one)</li> <li>10. Photometric Reproducibility: <math>\pm 0.001</math> Abs or better</li> <li>11. Photometric accuracy: <math>\pm 0.004</math> A or better</li> <li>12. Stray light: <math>&lt; 0.02\%</math> (220 nm NaI) or better</li> <li>13. Photometric Noise: <math>&lt; 0.00007</math> Abs or better</li> <li>14. Photometric drift: <math>&lt; 0.0003</math> Abs/h or better</li> <li>15. Baseline flatness: <math>\pm 0.0005</math> A</li> <li>16. One pair of quartz cell of 3.5 mL volume &amp; 10mm path-length must be quoted</li> <li>17. Computer: i7 processor with UPS (2 KVA online UPS) with Printer.</li> <li>18. Two sets of sample holder for analysis of liquid samples</li> <li>19. Software should have the facility for real</li> </ol>

		<p>time update of spectral information</p> <p>20. Demonstration of the equipment has to be given during installation</p> <p>21. Periodic annual maintenance should be provided</p>
2	<b>DSC analyzer</b>	<ul style="list-style-type: none"> <li>➤ Measurement principle: Heat-flux type</li> <li>➤ Temperature range: &lt; -150 to 600°C</li> <li>➤ Measurement range: ± 40 mW</li> <li>➤ Cooling: Automated cooling (cooling system should not use liquid nitrogen)</li> <li>➤ Cooling time: less than 15 minutes</li> <li>➤ Noise level: &lt;1 μW</li> <li>➤ Atmosphere: The analyzer should be operated in Nitrogen and air atmosphere</li> <li>➤ Power supply: 3 phase</li> <li>➤ Flow controller: for 120V, -93: for 230V (used to control the flow rate of atmosphere gases)</li> <li>➤ Sample sealer/crimper</li> <li>➤ Sample pans: Al hermetic pans,ø6 x 1.6 (1000 pic), limit pressure: &lt;0.4 MPa</li> <li>➤ Analytical balances: To weigh the sample, reading up to 0.001 mg.</li> <li>➤ Purge gas : Cleaning air tank or air compressor</li> <li>➤ Computer with i7 processor with online UPS</li> <li>➤ Software required to analyze the sample</li> <li>➤ Software required to determine the thermodynamic parameters</li> <li>➤ Facilities for multiple step temperature programs</li> <li>➤ Filled Nitrogen cylinder and air cylinder</li> </ul>

		<p>with controller if required</p> <ul style="list-style-type: none"> <li>➤ Flow controller such as rota meters should be provided</li> <li>➤ Required connection pipes and fittings should be provided</li> </ul>
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<b>TABLE-V (LIST OF EQUIPMENTS OF ENVIRONMENTAL ENGG. LABORATORY)</b>		
<b>EQUIPMENT SPECIFICATIONS</b>		
<b>S.NO</b>	<b>Name of the setup</b>	<b>Technical Specifications</b>
<b>1</b>	<b>FTIR</b>	<ol style="list-style-type: none"> <li>1. Should be able to measure solid liquid and gaseous samples.</li> <li>2. Spectral Range more than 4000 – 350 cm<sup>-1</sup></li> <li>3. Spectral Resolution standard 0.5 cm<sup>-1</sup> or better</li> <li>4. Signal-to-noise ratio should be 30,000:1 peak to peak for 1 min scan or better</li> <li>5. Wavelength accuracy 0.1 cm<sup>-1</sup> at 3000 cm<sup>-1</sup> or better</li> <li>6. Room temperature detector with high linearity is preferred.</li> <li>7. Must have KBr beam splitter and KBr windows.</li> <li>8. DRS is required.</li> <li>9. Must be the provision for the analysis of liquid samples</li> <li>10. Software should have the facility for real time update of spectral information.</li> <li>11. Software should have spectral comparison algorithm and Euclidean searching provision.</li> <li>12. Instrument having the facility of no nitrogen</li> </ol>

		<p>gas purging is preferred.</p> <p>13. All necessary accessories required for the installation and operation of the instrument must be quoted.</p> <p>14. FTIR should have the facility to hyphenate with TGA/STA system for evolve gas analysis. TG-IR heated interface from same manufacturer preferred.</p> <p>15. Computer with i7 processor, Printer, 2 KVA online UPS, 10-ton or better hydraulic press must be quoted</p> <p>16. Demonstration of the equipment has to be given during installation</p> <p>17. Periodic annual maintenance should be provided</p>
2	<b>TGA/DTA</b>	<ul style="list-style-type: none"> <li>• Temperature Range: 15 °C to 1500 °C or higher</li> <li>• TGA should have ultra-microbalance with minimum 0.1 µg sensitivity with top load design.</li> <li>• Balance Design: Single Beam vertical design with exchangeable sensor.</li> <li>• Furnace cooling down: 1500 °C to 30 °C within 20 minutes with built-in forced air cooling.</li> <li>• Built-in Mass Flow controller for two difference gases.</li> <li>• Heating rate ambient to 1000 °C: 0.1 to 300 C/min or better</li> <li>• TGA and DTA should operate upto 1500 C.</li> <li>• The gas flows to be controlled through built-in Mass Flow Controller and Software. The</li> </ul>

		<p>flows to be set through software as well as gas switching at the desired temperature.</p> <ul style="list-style-type: none"> <li>• Sample capacity 2000 mg or higher</li> <li>• The system should have built-in DTA mode with simultaneous scanning facility in single run.</li> <li>• DTA signal should have provision to convert into DSC mode/signal for quantitative studies.</li> <li>• Calorimetric precision should be <math>\pm 2\%</math> or better</li> <li>• All the three curves/parameters like TGA/DTA/DTG or DSC to be displayed on single screen.</li> <li>• Software should be provided to determine the kinetic analysis of the thermal degradation</li> <li>• Software should have the facility for real time update of spectral information.</li> <li>• Software should be provided to determine the area under the peak</li> <li>• 10 numbers of crucibles should be provided which will be operated at 1500 °C temperature.</li> <li>• Filled Nitrogen cylinder and air cylinder along with all the necessary attachments such as regulators should be provided</li> <li>• Flow controller such as rota meters should be provided</li> <li>• Required connection pipes and fittings should be provided</li> <li>• System should have the provision for hyphenation facility with FTIR &amp; GC-MS</li> </ul>
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		<p>instruments for Evolved Gas Analysis. Interfacing from same manufacturer is preferred.</p> <ul style="list-style-type: none"> <li>• Ceramic pans (5 nos) must be quoted with the instrument.</li> <li>• Demonstration of the equipment has to be given during installation</li> <li>• Periodic annual maintenance should be provided</li> <li>• The following items must be quoted with the instrument: <ul style="list-style-type: none"> <li>1. Suitable Chiller for cooling.</li> <li>2. 3 KVA online UPS</li> <li>3. Computer with i7 processor, Printer</li> </ul> </li> </ul>
3	<b>Incubator</b>	<ul style="list-style-type: none"> <li>➤ Should be operated on 230V,50Hz single phase AC supply, and having temperature ranging from ambient to 100°C</li> <li>➤ Should be double walled with stainless steel inner chamber having a minimum of two inner stainless steel shelves with holes and powder coated outer surface.</li> <li>➤ Inner chamber should be fabricated with ribs for adjusting shelves to convenient height.</li> <li>➤ Should have a minimum of chamber size of 450×450×450 mm.</li> <li>➤ Should be provided with three side heating elements.</li> <li>➤ Should have air circulating fan (Which can be turn ON/OFF on demand) for uniform temperature on all shelves.</li> <li>➤ Should provide with a microprocessor based</li> </ul>

		<p>digital temperature controller with digital display.</p> <p>➤ Should have synthetic rubber gasket at the door.</p>
4	<b>Rota evaporator</b>	<p><b><u>Main Unit</u></b></p> <p>Evaporation volume 1000-4000 ml</p> <p>Rotation speed 0-400 rpm</p> <p>Rotation speed control Adjustable control knob</p> <p>Head tilt angle 0-100°</p> <p>Rotation motor power - 40 Watts</p> <p>Lift up and down Manual</p> <p>Motorized lift stroke 150 mm</p> <p><b><u>Heating Bath</u></b></p> <p>Temperature range ambient 210° C</p> <p>Bath material Stainless steel</p> <p>Temperature control PID (LCD)</p> <p>Temperature accuracy ±1°C (Water) ±2°C (Oil)</p> <p>Heating power 1500 Watts</p> <p>Bath diameter 100-300 mm</p> <p>Bath volume 3-5 Lt</p> <p>evaporating flask- 1-2L</p> <p>receiving flask -1-2L vertical</p> <p>Condenser- Vertical(1L) with 1200 cm<sup>2</sup>condensing surface</p> <p>L×W×H mm (lift stroke 160mm included)</p> <p>380×340×692</p>
5	<b>Millipore Water setup</b>	<p>Resistivity at 25° C- 15-18.2 M Ω•cm</p> <p>TOC- 1-5ppb</p> <p>Particulates (size &gt; 0.22 μm)- &lt; 2 particulate/mL</p> <p>Bacteria -&lt; 0.2 CFU/mL</p> <p>Pyrogens (endotoxins) &lt; 0.001 EU/mL</p> <p>RNases&lt; 1 pg/mL</p> <p>DNases&lt; 4 pg/mL</p> <p>Flow Rate Up to 2-4 L/min</p>

**TABLE-VI (LIST OF EQUIPMENTS OF FLUID DYNAMICS LABORATORY)**  
**EQUIPMENT SPECIFICATIONS**

S.NO	Name of the setup	Technical Specifications
1.	Flow through Venturimeter and Orificemeter	<p>Venturimeter- Material Clear Acrylic compatible to 1 in dia pipe.</p> <p>Orificemeter- Orifice Plate made of Stainless steel and housing made of clear Acrylic compatible to 1 in dia pipe.</p> <p>Water circulation- FHP pump, Crompton make.</p> <p>Pressure measurement-By using pressure sensor.</p> <p>Flow measurement- By using flow sensor.</p> <p>Sump tank- Material SS, suitable capacity.</p> <ul style="list-style-type: none"> <li>• Tank will be made of SS</li> <li>• An English instruction manual consisting of experimental procedure, Block diagrams should be provided along with apparatus.</li> <li>• The whole set up should be well designed and arranged on a rigid structure painted with industrial PU paint.</li> </ul>
2.	Bernoulli's Theorem apparatus	<p>Test section-Material Acrylic (1No)</p> <p>Water circulation- FHP pump, Crompton make.</p> <p>Pressure measurement-By using pressure sensor (7 Nos).</p> <p>Flow measurement- By using flow sensor.</p> <p>Sump tank- Material SS, suitable capacity.</p> <ul style="list-style-type: none"> <li>• Tank will be made of SS</li> <li>• An English instruction manual consisting of experimental procedure, Block diagrams should be provided along with apparatus.</li> </ul>

		<ul style="list-style-type: none"><li>• The whole set up should be well designed and arranged on a rigid structure painted with industrial PU paint.</li></ul>
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