VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA

PO- ENGINEERING COLLEGE BURLA, DIST-SAMBALPUR,

ODISHA-768018

No. VSSUT/Elect/Tender/368 /2016 Dated: 16.04.2016

TENDER CALL NOTICE

Sealed tenders are invited from original manufacturers/authorized dealers for the supply of materials for laboratories of Electrical Engineering & EEE Department at VSSUT, Burla, Sambalpur, Odisha. The tenders shall reach the office of the undersigned through **Speed/Registered** post only **on or before 09.05.2016 up to 12.30PM**.

For more details, please visit our university website 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/Elect/Tender 369 /2016 Dated: 16.04.2016

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 "THE TIMES OF INDIA" (Odisha, Kolkata, Delhi and Bengaluru Edition) 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 /Department Notice Board of VSSUT, Burla.
3. Dean F&P, with a request to hoist the tender call notice in the University web site www.vssut.ac.in for wide publicity.
4. Comptroller of Finance, VSSUT, Burla for information and necessary action.
5. HOD, Electrical Engineering & EEE, for information and necessary action.
6. PA to Registrar for information and record. This is based on UCPP proceedings held on 2nd March, 2016 at 4:00PM and approv al of the proposal for procurement of Equipments/Instruments by the Hon'ble Vice-Chancellor on Dt. 26-02-16 and Dt. 10-04-16 at File No. EE/74 of Dept of Electrical Engg.
7. PA to Vice Chancellor for information of the Hon'ble Vice Chancellor.

19/4/16

REGISTRAR

Section I: Invitation for Bids

Sealed Tenders in two bids system (Technical Bid and Price Bid) are invited by the "The Registrar, Veer Surendra Sai University of Technology, Odisha, Burla" from reputed Manufacturers/ Authorized distributors /dealers having up-to-date VAT clearance certificate/PAN and TIN for supply of materials for laboratories of Electrical Engineering & EEE Department at VSSUT, Burla campus. The intending Bidders may download the Tender Documents directly from the website available at http://www.vssut.ac.in.

All the bidders are required to submit EMD not less than 2% of the quoted amount in the shape of demand draft in favour of "**The Registrar, Veer Surendra Sai University of Technology, Burla**" payable at SBI, Burla. The EMD shall be Indian Rupees. Non-submission of EMD or submission of EMD of lesser amount than required 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.

The cost of tender document of Rs.500/- (Non-refundable) is to be submitted in shape of Demand Draft drawn in favour of "**The Registrar, Veer Surendra Sai University of Technology, Burla**" payable at SBI, Burla along with the technical Bid. The tender cost fee and the EMD amount should be submitted separately in separate demand draft. 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. The envelope containing the Tender must be super-scribed as **"TENDER FOR ELECTRICAL ENGINEERING & EEE DEPARTMENT"** and tender notice No. & date.

Time Schedule:

a) Date of commencement of downloading bidding document 18.04.2016 at 11.00 AM
b) Last date and time for Receipt of bids 09.05.2016 up to 12.30 PM
c) Time and date of opening of Tender & technical bid 12.05.2016 at 11.30 AM
d) Time and date of opening of price bid : to be notified later on after verification of technical bid

Place of Receipt & Opening of Tender and Address for Communication

The Registrar
Veer Surendra Sai University of Technlogy, Odisha
P.O.-Burla Engineering College, Dist-Sambalpur-768018
Tel. No-0663-2430211 Fax No-0663–2430204

REGISTRAR

Section II: General Terms and Conditions

GENERAL TERMS AND CONDITIONS OF CONTRACT FOR SUPPLY, INSTALLATION AND DEMONSTRATION OF THE MATERIALS REQUIRED FOR DEPARTMENT OF ELECTRICAL ENGINEERING & EEE, 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 03(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 **Machineries** 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/Machinery.

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 (**N.B: Variation in specification is allowed upto±5% in case of Machineries/Equipments)**

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 materials 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 recognization 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.(N.B: Variation in specification is allowed upto±5% in case of Machineries/Equipments)**

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 materials 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 materials 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 **ELECTRICAL ENGINEERING & EEE**, 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 materials 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 2% of the quoted amount** in shape of **Demand draft d**rawn in favour of **"The Registrar, 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 Department:_____

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 invariable 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**

5.13 The ***Purchaser*** will open all bids, in the presence of bidder's representatives who choose to attend at **11.30 AM on dated 12.05.2016** at the Office of the **"The Registrar, Veer Surendra Sai University of Technology, Burla".**

5.14 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.

5.15 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**.
- If Bidder is not willing to provide operational Training for Machineries to one Official of each consignee at Suppliers Plant or Consignee site **at least for 7 days in case of major machineries whichever is suitable to Purchaser.**

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 (**but excluding VAT**) paid or payable on Machineries, instruments & equipment incorporated or to be incorporated in the items including the warrantee/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 &Machineries 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 **Up time Warrantee**

The Bidders should provide uptime guarantee of 95%.

6.6 **Downtime Penalty Clause**

During the warranty period, desired uptime of 95% of 365 days (24 hours) if downtime exceeds 5%, penalty in the form of extended warranty, double the number of days or more will be applied for which the equipment goes out of service.

In no case the machineries should remain in non-working condition for more than 30 days beyond which a penalty of 0.2% of machine cost will be charged per day.

6.7 **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.

6.8 **Transportation**

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

6.9 **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.

6.10 **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.

6.11 **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.

6.12 **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.

6.13 **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.

6.14 **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.

6.15 **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.

6.16 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.

REGISTRAR
VSSUT, Burla

ANNEXURE-I (a)

PRICE SCHEDULE (ITEM WISE) -A

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

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 materials to be supplied by the bidder

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

Signature and seal of the Bidder

SPECIFICATION OF THE EQUIPMENTS/ INSTRUMENTS

Name of the Lab. :	**POWER SYSTEM LABORATORY**	
Sl. No.	**Name & Specification of Instruments/Equipments/ Materials**	**Quantity**
1	**IDMT Over Current Relay Trainer (Numeric)** • Integrated Single Phase Relay with multiple curve setting and high-set • MCB Protection with internal short circuit protection. • Inbuilt Breaker for Relay Trip • 220V Input Single Phase Operation • Power On /Off Switch with Indicator • Inbuilt AC/DC auxiliary power supply for relay • Linear Current Source with Inbuilt Loading System • Autotransformer based output Current Control (0 – 6 A) • Inbuilt Digital Meter for Current • Inbuilt isolation transformers • Inbuilt digital timer for trip time test (0.001 sec – 999 sec) • Reset timer switch / auto • Breakers for source turn on / off • Power On / Fault Indicators • MS Panel for Mounting Relays and Test Kit • Powder coated panels for corrosion free and longer life • All terminals are brought out front panel banana sockets for ease of accessibility • Completely wired internally • Connecting Probes supplied along with the equipment • Detailed manual with theory and practical guidance with tables and charts	01

2	**Percentage Biased Differential Relay Trainer (Numeric type)** • Integrated Single Phase Relay with cutout and terminals • 220V Input Single Phase Operation • 2 Slope Characteristics • 2 X Autotransformer based output Current Control (0 – 7 A) • Inbuilt Breaker for Relay Trip • Inbuilt Timer for Trip Time (0.001 sec – 999 sec) • Power On indication • Fault Indication • MCB Protection • Slow Blow Fuse in Primary Side • 2 X Ammeter (0.1 – 20.0 A) • Inbuilt CT • Reset timer switch / auto • Breakers for source turn on / off • Power On / Fault Indicators • MS Panel for Mounting Relays and Test Kit • Powder coated panels for corrosion free and longer life • All terminals are brought out front panel banana sockets for ease of accessibility • Completely wired internally • Connecting Probes supplied along with the equipment • Detailed manual with theory and practical guidance with tables and charts	01
3	**Distance protection relay trainer (Numeric)** • Integrated Single Phase Distance Relay • MCB Protection with internal short circuit protection. • Inbuilt Breaker for Relay Trip • 3 Phase Input for Test Kit Operation	01

	• Power On /Off Switch with Indicator • Inbuilt AC/DC auxiliary power supply for relay • Linear Current Source with Inbuilt Loading System • Autotransformer based output Current Control (0 – 6 A) • Inbuilt Digital Meter for Current • Linear Voltage Source • Autotransformer based Voltage Control (0 – 150V) • Inbuilt Digital Meter for Voltage • Inbuilt isolation transformers • Current Angle variation in steps of 30 degree (Upto 180 degree) • Inbuilt digital timer for trip time test (0.001 sec – 999 sec) • Reset timer switch / auto • Breakers for source turn on / off	
4	**Under / Over voltage Relay Trainer (Numeric)** • Integrated Single Phase Relay with UV and OV Settings • MCB Protection with internal short circuit protection. • Inbuilt Breaker for Relay Trip • 220V Input Single Phase Operation • Power On /Off Switch with Indicator • Inbuilt AC/DC auxiliary power supply for relay • Linear Voltage Source • Inbuilt Voltage Source up to 0-300V (continuously variable) • Inbuilt Digital Meter for Voltage • Inbuilt isolation transformers • Inbuilt digital timer for trip time test (0.001 sec – 999 sec) • Reset timer switch / auto • Breakers for source turn on / off • Power On / Fault Indicators • MS Panel for Mounting Relays and Test Kit • Powder coated panels for corrosion free and longer life	01

	• All terminals are brought out front panel banana sockets for ease of accessibility • Completely wired internally • Connecting Probes supplied along with the equipment • Detailed manual with theory and practical guidance with tables and charts	
5	**Under / over frequency relay trainer (Numeric)** • Integrated Single Phase Relay with UF and OF Settings • MCB Protection with internal short circuit protection. • Inbuilt Breaker for Relay Trip • 220V Input Single Phase Operation • Power On /Off Switch with Indicator • Inbuilt AC/DC auxiliary power supply for relay • Inbuilt Frequency Source Variable from 30 – 70 Hz • Inbuilt Digital Meter for Frequency • Inbuilt digital timer for trip time test (0.001 sec – 999 sec) • Reset timer switch / auto • Breakers for source turn on / off • Power On / Fault Indicators • MS Panel for Mounting Relays and Test Kit • Powder coated panels for corrosion free and longer life • All terminals are brought out front panel banana sockets for ease of accessibility • Completely wired internally • Connecting Probes supplied along with the equipment • Detailed manual with theory and practical guidance with tables and charts	01

Name of the Lab. :	COMPUTATION LABORATORY	
Sl. No.	**Name & Specification Materials**	**Quantity**
1	**Desktop Computer Intel core-i7 (Lenovo/HP)** • Processor = Intel Core i7-4770, 3.4 GHz, • Cache Memory = 8 MB L2 Cache • Mother Board = Intel® Q8 Chipset • Hard Disk Drive = 500 GB SATA SMART II 7200 rpm • Memory = 4 GB 1600 MHz DDR3 RAM with 32 GB Expandability Display Unit = 19.5" LED Color Monitor • Optical Drive = 20x DVD RW • Interface Ports = 6 Port High Speed USB Connector 2.0 • Graphics = Integrated Intel Graphics Memory • Networking = 10/100/1000 Network Card • Keyboard = Keyboard / USB Opt. Mouse with Pad Preloaded Software = Windows 8.1 Prop.,Microsoft Security Essentials	10
2	**Printer : HP Laserjet Pro M402 dw** • Automatic two-sided printing • Built-in wireless networking • Hi-Speed USB 2.0 printing port	01
3	**On-Line UPS** • Rating of UPS : 10 KVA Capacity, • Indicative Back-up time : 01 hour • Input Voltage : 160 – 260 V • Output Voltage : 230 V +- 1% • Suitable for single phase AC input and single phase AC output	01 set

Power Electronics & Drives Lab

Sl.No.	Description of the Instruments	Quantity	Specifications
1	Static Characteristics of MOSFET & IGBT	2 Set.	**1. Power module :** a) 20A MOSFET mounted on proper heat sink and protection by fuse. b) 20A IGBT mounted on proper heat sink and protection by fuse. **2. Digital panel meters:** Two voltmeters and an ammeter to measure Vds, Vg and Id respectively. **3. Power Supplies:** a) A variable D.C Power Supply of 0-15V/500mA for gate current. b) A variable D.C Power Supply of 0-100V/1A for Load current. 4. **Load:** A variable load resistance 5KΩ/100W.
2.	Speed control of separately excited DC motor using IGBT	2set.	**1. Power Circuit:** POWER MOSFET, IGBTs of 50A/1200V with freewheeling diode and in built filtered DC supply -24V, 48V, 110V &220V 2A (selectable using switches) diode rectifiers. **2.Power Supply:** Fixed DC of 0-250V/2A to drive ½ HP 220V, 1500rpm DC motor **3. Chopper Firing Circuits:** Firing Circuit with operating frequency: 25HZ to 100HZ and duty cycle 0% to 100%. Key board consist 4 keys to select frequency and duty cycle , increment / decrement the parameter and RUN/STOP the chopper. **4. Digital panel meters**: Digital Voltmeter & ammeter for measurement. **5.** Digital Non contactor type tachometer, Range:- 0-9999RPM **6.** It works directly on 230V AC main. This unit can be used for R- Load, R-L Load, PMDC motors -24V,48V and 110V.
3.	Speed control of a universal motor & single phase	2 sets	**1.** This controller unit has two parts: Firing circuits and Power circuits **a) Firing Circuits:** This unit generates 2 line

	induction motor using AC voltage controller		synchronized pulse transformer isolated trigger pulse. This triggering pulse can be used to trigger i) Single phase AC phase control using SCR's (Anti Parallel SCR's) ii) Single phase AC phase control using TRIAC. iii) Single phase half wave rectifiers (Single SCR's) iv) Single phase full wave rectifiers (Two SCR's) v) Single phase half controlled bridge rectifiers (Two SCR's and two diodes) The firing circuits is based on zero crossing detector, ramp generator, Op-amp, comparator, amplifier with pulse isolation vi) Speed variation: 0- maximum (0-180^0) **b) Power Circuit:** The power circuit consists of 2 SCR's, 3 diodes and a TRIAC (40A/1200V). The power device should be mounted on suitable heat sink for power dissipation. The snubber ckt. Is connected for dv/dt protection. A fuse is provided in series with device for short circuit or over voltage protection. MCB is provided for protection of the device. **2. Digital panel meters**: Digital AC/DC Voltmeter & ammeter for measurement for input/output voltage & current. **3.** Universal Motor : 0.5 hp/230V **4.** Digital Non contactor type tachometer, Range:- 0-9999RPM.
4.	Single phase ac voltage controller for using TRIAC and DIAC combination connected to R, & R-L load	2 sets	This unit consists of RC phase shifting components, DIAC, TRIAC with snubber ckt. for 220Ω, 2.8 resistive load and a single phase fan load.
5.	Forced commutation study unit	1 Set	Forced commutation study unit for Class – A, Class – b, Class – C, Class – D & Class – E. It can be loaded 300Ω,1.7A Rheostat
6.	Single phase cyclo converter.	1 Set	This converter unit has two parts power circuit and firing circuits. **1. Power Circuit:** 4 nos. of SCRs with fuse protection. Anode, Cathode & gate terminals are on the front panel for user connection. **2. Firing circuits:** Linear synchronized IC

			based linear firing circuit. 4 nos of firing pulses with pulse transformer isolation to trigger SCRs. One no of potentiometer used to vary the firing angle (180^0-0^0). One no. of toggle switch with debounce logic for pulse ON/OFF. **3**. **Digital panel meters**: Digital AC/DC Voltmeter & ammeter for measurement for input/output voltage & current. **4. Accessories:-** 150 Ohms/5A Rheostat , 150 mH/5A Inductor with tappings, Isolation Transformer 1 KVA, 1:1 115-0-115V with Tappings
7.	Static characteristics of SCR:	2Sets	**1. Power Module:** 10A SCR mounted on heat sink and protected by fuse. **2. Digital panel meter:** Two voltmeter & two ammeter to measure Vak.,Vgk, Ia,& Ig. Respectively to find out holding and latching current. **3. Load:** A variable load resistance to be fixed.
8.	MOSFET or IGBT based single phase full bridge inverter connected to R load.	1 set	**1.** This converter has 4 IGBT's or 4 MOSFET's of 50A/ 1200V with PWM inverter. All terminals should be brought out to front terminals. **2. Digital panel meter:** Voltmeter & ammeter for input/output voltage & current. **3.** Firing frequency varied from 20Hz to 100Hz. **4**. Load Rheostst :- 100Ω, 5A. **5.** Works directly on 230V AC mains.
9	SCR Digital triggering circuit for single phase controlled rectifier and AC voltage controller.	2 set	AC voltage controller :- This firing circuits generates isolated triggering pulses for 1-phase converter using SCR & Triac and DC chopper power circuits. The firing angle can be varied from 0-180% with 1% resolution and duty cycle varied from 0-100% with 1% resolution with thumb wheel switches. The firing scheme is based on ZCD, Fixed frequency line synchronized clock generator, Up/down counter, flip flop and pulse transformer isolation method. IC 74123 monostable multivibarator is provided to generate pulse of duration 100µs for chopper expt.

Electronics Circuit Lab

Sl.No.	Description of the Instruments	Quantity	Specifications
1	CRO (Analog Type)	5 nos.	Bandwidth-30MHz No. Of Channel-2 with invert facilities for both channel. 1mV/div to 20V/div High Vertical Sensitivity Accuracy:-+/- 2%, Sensitivity:1mV/cm Triggering modes: Auto & variable level with LED indication for stable triggering Component tester facilities, Calibrator of square wave 0.2V &2V 1KHz for probe compensation XY Mode facilities, Z-Axis Input and External Trigger Input
2.	CRO (DSO)	2nos.	Bandwidth- 50 MHz No. Of Channel-2 Sampling Rate- 1GSa/s Maximum input:- 400V(peak ac+dc) Record Length-2 Mega points High Resolution TFT LCD Display 2mV /div to 10V/div of Vertical Range 5ns/div to 50s/div of Time Base Range 400 wfm/s of Waveform Update Rate Memory:- 16Kpts, Resolution:8 bit USB 2.0 host port on front panel easy data storage and for easy connection to PC
3.	Digital Function Generator	5 nos.	i) Sinusoidal, Triangular, Square wave, DC, impulse, TTL ii) D.C. off set on all waveform. iii) Frequency range: - 0.5Hz to 3 MHz. iv) Output Voltage: - 20mV to 20V (P-P). v) Frequency Display: 4 digit LCD vi) Modulation: Internal sweep or External Frequency Power requirement 230V AC +/- 10% 50Hz.
4.	Regulated Power Supply	5 nos.	**1**. Input Power: - 230V A.C, +/- 10%, 50Hz. **2.** Out Put: - 0-30V D.C., 0-3A DC with course & fine control for both the voltage & current Automatic over load and short circuit protection. **3. Digital panel meters**: Digital Voltmeter & ammeter for measurement for voltage & current. **4.**Accuracy: +/-(1%+1 digit)

5.	Bench type multimeter	10 nos	No. of Digit: 4 ½, True RMS, Basic accuracy: 0.02%, DC measured range 200 mili Volt to 1000V, AC measured range 200 mili Volt to 1000V, DC/AC Current 200microA-20A with fuse protection, Resistance measurement range 200Ω to 20 megaΩ, Frequency 0.01Hz to 1KHz., A continuous audible beep for resistance continuity tester less than 10Ohm. Power supply : 230V AC 50Hz.
6.	CRO Chords (1:1)	100 nos.	CRO chord (1:1) BNC to crocodile clip of co-axial cable
7.	Training Board	4 Nos	Training with following functions. Logic inputs – 10nos. Clock generator with *low frequency-1 Hz. *Medium frequency-100Hz. *High frequency – 1KHz. * Mono pulser manual frequency (Q,Q') * Two Seven segment displays 2 nos. of Bread board. DC reg. Power supply +/- 5V,+/- 12V/500mA AC power supply of 12-0-12V 500mA
8	Operational amplifier circuit experiments	4 nos.	Operational amplifier circuit which has inverting, Non-inverting, summing, difference amplifier, inverting, differentiator circuits, precession rectifier, half & full wave voltage to current and current to voltage converter, voltage to frequency converter and frequency to voltage converter.
9	BJT based trainer kit	02 nos.	BJT biasing circuit as fixed, biased, voltage divider& feed back
10	BJT based trainer kit	02	BJT based trainer kit as output characteristics and high frequency response.

Digital Circuit Lab.

Sl.No.	Description of the Works	Quantity	Specifications
1	Xilinx software	1	Xilinx Vivado Design Suite Sotware-System Edition (25 users license perpetual type)
2	FPGA Kit	2	Xilinx Kintex-7 FPGA KC705 Evaluation Kit
3	FPGA Kit	3	Xilinx Zynq-7000 All Programmable SoC ZC702 Evaluation Kit

Microprocessor & MicroController Lab

Sl.No.	Description of the Instruments	Quantity	Specifications
1	8051 Advanced microcontroller	4 nos.	**Processor:** Intel 8031/8051, 8- bit Micro controller@20MHz clock speed, **Memory:** RAM 64KB, EPROM 32KB loaded with monitor expandable further using 27010 **Key Board & Display:** IBM-PC key Board (104 key with USB facilities) 16*2 Graphical LCD display with 8 line for display with back light. **Timer & Bus Expansion:** 16 bit programmable counter / timer, 8 TTL I/O/lines terminated at FRC connector. Digital I/O//lines are terminated in 20 Pin connector. **Interface:** RS232C compatible serial port through SID/SOD lines with auto baud rate. Cross assembler Powerful 8085 interrupt capabilities. 2 nos of 8255 & 1 no of 8253 **Other facilities on board:** EPROM programmer for 2764/27128/27256, Real time clock interface, A/D converter, D/A converter, DIP relay with two NO,NC contacts, Opto isolated inputs, 12 output LEDs, Speaker interface, on board RTC, on board Assembler & Dissembler, with inbuilt power supply.
2.	FPGA Kit	2nos.	• NEXYIS 4DDR ARTIX-7 • 10/100 Ethernet PHY • 12-bit VGA output • 128MiB DDR2, 16 user LEDs • 16 user switches • 3-axis accelerometer • Digilent USB-JTAG port for FPGA programming and communication • Four Pmod ports • Micro SD card connector • PDM microphone, • PWM audio output • Pmod for XADC signals • Serial Flash, Temperature sensor • Two 4-digit 7-segment displays • Two tri-color LEDs • USB HID Host for mice, keyboards and • Memory sticks, USB-UART Bridge

Electrical Machine Lab.

Sl.No.	Description of the Instruments	Quantity	Specifications
1	3 Point heavy duty DC shunt motor sartor.	5 nos.	3 Point heavy duty DC shunt motor sartor for 15H.P.,220V
2.	Stroboscope	3nos.	Non-Contact-type, High intensity XENON flashes – operation possible from a reasonable distance (0.%m) in usual ambient light in a room . Detachable lamp unit with 1.5m cable, 4 Digit speed display in rpm – operating range of 500-9900 rpm, resolution 1rpm. High accuracy crystal controlled LED display, 220 volt ± 10%,50 Hz mains operated, Builtin Regulated power supply
3.	Tachometer	5 nos.	Contact type Digital Tachometer with all accessories. Measuring Range :-6.0 - 99999.9 rpm Sampling Time :- 1.0 to 10.0 Sec. Display:-6 digit 7 segment LCD Auto Power Off:- After 3 Min. of Non-use
4.	A.C Voltmeter	5 nos. from each type.	Portable analogue Lab. use MI type A.C Voltmeter. Accuracy class- 1.0% (Wooden Case & Brass terminals) **1.** 0-50-100V **2.** 0-150-300V **3.** 0-300-600V
5.	D.C Voltmeter	5 nos. from each type.	Portable analogue Lab. use PMMC type D.C Voltmeter. Accuracy class- 1.0% (Wooden Case & Brass terminals). **1.** 0-300V **2.** 0-50V
6.	LPF wattmeter	5 nos. from each type.	Portable Single phase single element electrodynamometer type L.P.F (0.2 p.f.) wattmeter(Wooden Case & Brass terminals). 1. Pressure coil – 125/250/500 volt, Current coil - 2.5/5A 2. Pressure coil – 62.5/125/250 volt, Current coil - 10/20A
7.	AC ammeter	5 nos.	Portable analogue Lab. use MI type A.C ammeter. Accuracy class- 1.0% (Wooden Case & Brass terminals) 0-2.5-5A.

8	DC ammeter	5 nos.	Portable analogue Lab. use PMMC type D.C ammeter. Accuracy class- 1.0% (Wooden Case & Brass terminals). 0-2.5-5A.
9	Rheostat	02 nos.	Heavy Duty Industrial type Sliding Rheostat wound on electrical grade insulator, silicon coated, highly insulated, slider movement controlled directly by hand operated knob with mounting arrangements. 300Ω, 1.7A,
10	3 Phase wattmeter	03	Portable three phase four wires with balanced and unbalanced load, 3- element dynamometer type wattmeter. (Wooden Case & Brass terminals) Class 1.5 1. Pressure coil –500V/600 volt, Current coil - 10/20A

High Voltage Lab.

Sl.No.	Description of the Works	Quantity	Specifications
1	Repair works of transformer	1no.	Repair works of transformer 25KVA, 230V/100KV shall covers Filtration of old transformer oil (supply of new transformer oil if required for topping up). Oil filtration set shall conform to latest version of IS : 6034. Replacement of all gaskits and other insulating materials, replacement of all studs and LV bushings (if requires). Replacement of silica gel Breather. Painting: Before painting all ungalvanised part shall be thoroughly cleaned. The surface shall then be applied two coats of primer before being finally sprayed with labour charges. Replacement (if required)of 132KV bushing is fitted over the transformer

CONTROL & INSTRUMENTATION LAB

Sl No.	DESCRIPTION OF THE MATERIALS	Qty	Specifications
1	RTD- 3 wire,	1	Platinum RTD, class-B, tolerance:±(0.3 + 0.005 |t|),100 ohms, 4-20 mA and single ended or differential 0-5 V, 0-10 V, ±5 V and ±10 V
2	IC temperature sensor	1	400 µA to 5 mA, 10 mV/°K, –55°C to 150°C,
3	Capacitive transducer:	1	Resolution:0.003% @ 15 kHz typical (as low as 0.25 nanometers),0.0005% @ 100 Hz typical (as low as 0.05 nanometers),bandwidth: (100 Hz, 1 kHz, 10 kHz, unfiltered) Probe/Range dependent, Linearity: 0.2%, Typical,15 kHz Bandwidth, Measurement Ranges Available: 10 µm to 12.5 mm,±10 V Output, DAC connection with 64 pin
4	LDR and photo diodes:	1	Single Supply: 2.7 to 36 V, Bandwidth: 14 kHz, Current: 120 µA
5	Incremental shaft encoder:	1	(5-24V)DC, Short-circuit Protection, Reverse Polarity Protection, Up to 12,000 RPM, -20°C to +90°C,
6	Cold junction compensation and linearization thermocouples	1	Type of thermocouple = J • Thermocouple Seebeck coefficient = 52.17 µV/ºC • Hot-junction temperature range = –100°C to 400°C • Cold-junction temperature = 25°C • Cold-junction temperature gradient = 10 mV/ºC • Output voltage range = 0 V to 2 V, 4-20 mA, and single ended or differential 0-5 V, 0-10 V, ±5 V and ±10 V
7	Pressure transducers:	1	4- to 20-mA and 0- to 10-vdc outputs, accurate to ±0.25% full scale typical, with low total error band (-20Â° to 100Â°C),
8	Designing of Ladder logic for various practical applications, Execution of the Ladders using PLC's	1	8-channel digital input module front end for plc, over-temperature indicator, Combinational and Sequential Logic Gate Circuits
9	Study of Analog and Digital Servo Systems:	1	88-264 V ac, 5 A, operating frequency, 72 MHz, 20 kbytes RAM, 64 kbytes Flash ROM, 12-bits, 1 µs settling time, USB 1.1 or 2.0 and JTAG directly to microcontroller seven segment display LED:, 32-bit microcontroller coupled to a

			power amplifier, PC-based control using LABVIEW or MATLAB/ SIMULINK,
10	Velocity Control System:	1	Supply voltage 24 V AC/DC ±15 % directly from the controller to which the sensor is connected. – Measuring range: 0 to 1 m/s – Output signal 2 to 10 V DC – Permissible temperature range in operation 15 °C to 40 °C for storage –20 °C to +85 °C
11	Adaptive Control System:	1	Adaptive active noise control kit
12	Non Linear Control Systems:	1	Describe function kit
13	Digital Storage Oscilloscope:	2	4 Channel with 100Mhz Bandwidth,1 Gsa/S-GDS-1104B
14	CRO probes:	20 nos	CRO chord (1:1) BNC to crocodile clip of co-axial cable
15	Relay control system Kit	1	The Simulated Process: Simple lag of 10ms, 2 lags of time constant 10ms that can be toggled to integrators of same time constant. Distance-velocity lag & delay 10ms. Electronic relay by Op-Amps. Potentiometers provided for adjusting hysteresis and dead band zone. Mimic diagram in the front panel for easy reference. Built-in signal sources-sine and square. # Amplitude : 0-5V # Frequency : 1Hz-100Hz .In built IC regulated power supply
16	Patch Cords	100 nos	thin pin, both end connected provision for instrumentation and control lab kit.
17	Vibration Measurement & Calibration Kit	1	The Vibration Meter is established for quick measurements of an imbalance and the examination of bearings and gears. - Vibration velocity: 0.01 ... 199.9 m/s² peak - Accuracy: ±5 %, ±2 Digits (20 Hz ... 1 KHz) / ±10 %, ±2 Digits (10 Hz ... 20 Hz) - Frequency: 10 Hz ... 1 kHz - Pocket-size
18	Flow Measurement By Rotameter	1	**Flow Range** Liquid Flow rate 0.65cc/min to 530 gpm in pipe from 1/8 to 4 inch in dia and gasses (air) from 47 sccm to 860 scmm, **Accuracy.** Typical accuracy ±2% to ±10% F.S., depending on type, size, and calibration **Repeatability.** ±0.5% to ±1% F.S.

			Viscosity. Liquids up to 200 cP **Rangeability.** 5:1–12:1
19	ECG Simulator kit (12 Lid)	1	Generating Range: 30-300 heartbeats/minute ECG Amplitude Range: 200mV- 4V DC Dimensions (mm): 326x252x52 Power supply: 110V - 260V AC, 50/60 Hz Weight: 1.5 Kg (approximately) Test Point: 1 nos. (Gold Plated) Low Pass Filte: Cut-off frequency-5 KHz Operating Condition: 0-40 C, 85% RH
20	EEG Simulator Trainer Kit	1	The EEG Simulator consists of 16 channels and point to observe the different waveforms. 1. Input power : 230 V AC Supply, 500 mA 2. Frequency knob : for varying Delta, Theta, and Beta at diff. frequency 3. Amplitude knob : vary amplitude of each frequency 4. LEDs : D for Delta, T for Theta, Alpha and B for Beta 5. Output pin & Common point : To observe different waveforms. 6. Charging On switch : ON/OFF 7. Enclosure : ABS