



# INSTITUTE OF TECHNOLOGY, KORBA (C.G.)

BALCO - URGARING ROAD, VILL- JHAGARHA,

POST - RISDI, KORBA, DISTRICT- KORBA (C.G.)

PHONE NO.07759-659874, 098939-05053, 094241-44099,99814-43708

E-mail: [korbait@rediffmail.com](mailto:korbait@rediffmail.com), Website: [www.itkorba.com](http://www.itkorba.com)

Tender No. ITK/Purchase/2014/252(1-8)

Korba, Dated: 31/01/2014

## **NOTICE INVITING TENDER**

Institute of Technology, Korba, Chhattisgarh invites sealed tender for eligible bidders (Manufactures, or their authorized dealer) for procurement of various Packages of Tools, Equipments & Machinery for various departments of I.T. Korba (C.G.)

The tender form (Complete set of bidding documents along with the packages including details of item with quantity for purchased) is available on the website [www.itkorba.com](http://www.itkorba.com). A complete set of bidding documents may be purchased by any interested eligible bidder.

The sealed tender should reach the office of the Principal, Institute of Technology, Korba, Balco-Urga Ring Road, Village-Jhagarha, Post-Risdi, Korba, District-Korba (C.G.) 495683 on or before 22.02.2014 by 17:00 hours and will be opened on 24.02.2014 at 15:00 hours. Any bid received after the deadline for submission of bids as prescribed above will be rejected and returned to the bidder. The undersigned has all the rights pertaining to the tender. For any information please contact the I.T. Korba (C.G.).

Principal  
Institute of Technology  
Korba (C.G.)



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Tender No. ITK/Purchase/2014/252(1-9)

Korba, Dated: 31/01/2014

Last date of selling tender document : 22/02/2014 at 16:00 hrs

Last date of submission of sealed tender document 22/02/2014 at 17:00 hrs

Date of opening of tender document : 24/02/2014 at 15:00 hrs

CATEGORY/DEPARTMENT: .....

## **TERMS & CONDITION OF THE TENDER**

Tender documents/Qualification requirements should be submitted in **Main envelope** as give below:

### **Tender Document Procurement:-**

1. Tender document can be obtained by the prospective tenderer on payment of Rs.1000/-(Rs.One thousand only) through demand draft only in favour of "Principal Institute of Technology, Korba" payable at Korba in person from the college or can be downloaded from our website [www.itkorba.com](http://www.itkorba.com). The DD of Rs.1000/- (Rs.One thousand only) as tender document fee must be submitted with downloaded tender document. The Tender form is non transferable.

### **Tender details:-**

2. The tender contains nine parts viz. (i) Civil Engg. (ii) Computer Science Engg (iii)Electrical and Electronics Engg. (iv) Mechanical Engg.(v) Physics (vi) Chemistry (vii) Stores (viii) Networking & Wi-Fi each part of the tender contains two stage bidding: Technical and commercial bids

### **Tender Submission details:-**

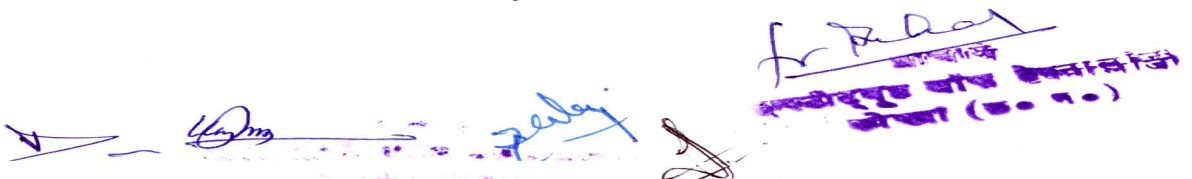
3. tender documents should be submitted Separately for technical bidding (only the technical specification) and commercial bidding .The sealed tender should be clearly marked as technical bid and commercial bid on the top of the envelope, for each category/department of the tender. The envelope should be marked with the category/department number for which it meant.
4. Tender should be submitted in Duplicate. They should be tagged separately and marked as original and duplicate. Complete tender document must be duly signed, stamped, paged & indexed by the bidder. Unsigned or unpagged bids shall be straightway rejected.

5. Tender document will be prepared in following manner-

- a. Main envelop "A"- Contains Two following envelops "B" & "C".
- b. Technical Bid envelop "B"- Contains Technical Bid & all mentioned documents as per clause 6 of this tender documents with EMD.
- c. Financial bid "C"- Contains financial bid for the tender.

6. Following documents should be kept inside the envelope "B":-

- a. Covering letter for submission of bid which should indicate-
  - Index for all the submitted documents for the tender
  - All particulars of bidders viz address, phone no., e-mail, name of the authorized person(s), TIN/TAN/ Service Tax No. etc. for correspondence.
  - Category/department, Package Nos. & Name for which bid is submitted.
- b. Completely filled Form - "A" with signature & seal of authorized person which includes Earnest Money/ Bid security details - @ 5% of total tendered value. Tender received without form "A" duly signed (As token of acceptance of tender conditions by the tenderer) will not be accepted.
- c. Demand Draft/ Bank Guarantee (as given in the proforma Annexure-III) for earnest money/ bid security.
- d. Valid certificates related to TIN / TAN / Service Tax No. etc. issued by competent Govt. authority pertaining to tender.
- e. Undertaking for "After Sales Services" on letter head of bidder.
- f. Affidavit in prescribed format as given in Annexure-V on non judicial stamp paper of Rs. 50/- certified by Notary.
- g. Manufacturer's Company Profile showing its product range, turn over, web-address and certifications like ISO/ ISI etc. along with the documentary proof of such certificates if company/ products bear such certificate.
- h. All relevant particulars, illustrative catalogue/ brochures etc. which should indicate the products technical specifications for all packages which is submitted in the bid.
- i. Filled Manufacturer's Authorization Form as given in SECTION XII (Annexure-VI) for all the quoted items.

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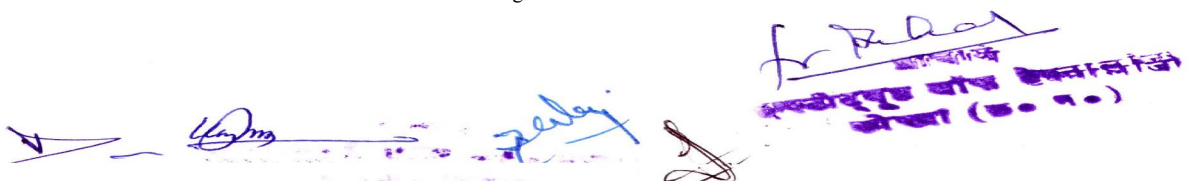
- j. The bidder should submit the Manufacturer's Make/ Brand name being use for marketing and registration no. of Commercial Tax Department.
- k. Category/department, Package wise Commercial Bid in prescribed format (i.e. Annexure-I) should be submitted (Separately for each package) in individual envelope along with the soft copy in CD (MS-Excel).
- l. On the top of each envelope of Commercial bid, bidder should clearly mention Tender No., Due Date, Category/department, Package No. and Package Name with seal & sign of bidder.

**Tender opening details:-**

7. Commercial bids of those tenders, which are found technically suitable, will only be opened and considered for the items technically approved.
8. Commercial bid opening dates will be finalized after opening of technical bids and shall be informed to the technically approved tenderers separately.
9. Complete Tender Documents will be opened on the prescribed date and time in the presence of Bidders / representatives who choose to attend. The Bidders / representatives who are present should submit authorization to participate and shall sign a register evidencing their attendance.

**EMD Details:-**

10. The bid should be accompanied by Earnest Money/ bid security of @ 5% of total tendered value (for all quoted packages) as part of the bid, in the form of Bank Draft/ Bank Guarantee of Schedule Bank. Bank Draft should be in favour of "Principal, Institute of Technology, Korba" payable at Korba, Chhattisgarh. If the bidder deposits earnest money/ bid security in the form of Bank Guarantee, he/she shall furnish the same to the "Principal, Institute of Technology, Korba" for 5% of total tendered value through a bank guarantee by a Schedule Bank. In the prescribed proforma as Annexure-III. Earnest Money submitted in any other form will not be accepted and the tender will be rejected. Unsuccessful bidder's earnest money will be discharged/ returned as promptly as possible. The EMD will be treated as security deposit in case of selected tenders. EMD/Security deposit will be forfeited in case of breach of agreement of supply by the tenderer (supplier).



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11. The supplier can quote part or full packages of tender (applicable to all tender categories except Library) and proportionately the EMD may be submitted
12. If any document given by the bidder is found fake/manipulated, then the entire EMD deposited by the bidder in the tender will be forfeited without assigning any reason and such bidder will not be entitled for future biddings.

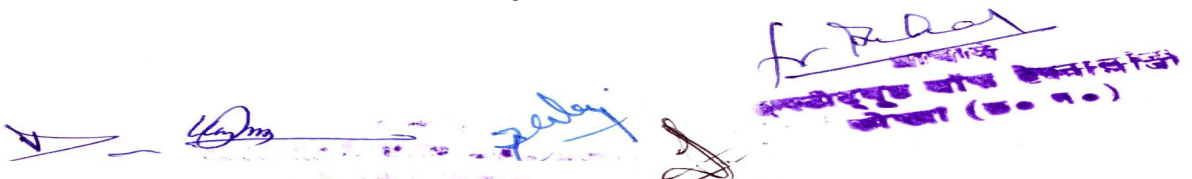
**Award of Tender:-**

13. Contracts will be awarded only for those items which have minimum 3(Three) valid rates.
14. Rates will be finalized for purchase on the basis of the final total package value for all the items not on individual items. The rates quoted for total package value will be considered for comparison.
15. Contracts for procurement of packages will be awarded as per the priority and availability of budget. Suppliers has to deliver and complete the task of installation strictly as per the specification of ordered items within stipulated time otherwise above contract may be treated as canceled without any prior notice.
16. Before executing the awarded contract the Supplier shall furnish Performance Security to the The Principal, Institute of Technology, Korba (C.G.) Chhattisgarh for an amount of 5% of the contract value through a Bank Guarantee by a Schedule bank, in the prescribed Performa as Annexure- IV, valid upto 60 days after the date of completion of performance obligations including warranty obligations. If the desired Performance Security is not deposited by the tenderer in the specific period, the Earnest Money already deposited with the tender shall be forfeited. In the event of any correction of defects or replacement of defective material during the warranty period, the warranty for the corrected/ replaced material shall be extended to a further period of 12 months and the Performance Bank Guarantee for proportionate value shall be extended 60 days over and above the extended warranty period. In the event of any contract amendment, the Supplier shall, within 21 days of receipt of such amendment, furnish the amendment to the Performance Security, rendering the same valid for the duration of the Contract, as amended for 60 days after the completion of performance obligations including warranty obligations.
17. The Principal, Institute of Technology, Korba (C.G.) Chhattisgarh reserves the right at the time of Contract award to increase or decrease the quantity of goods originally specified in the Packages without any change in unit price or other terms and conditions.

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### **General Terms & Conditions:-**

18. Prices shall be quoted in Indian Rupees only. All quoted rates should be for new and unused items unless and otherwise specified so.
19. The rates quoted by the bidder must be inclusive of all the charges (like – transportation, installation charges, delivery charges, inspection charges, training charges, charges for services, excise duty, customs duty etc.) except VAT. The VAT should be mentioned separately.
20. The tender matter including prices should be typed neatly; corrections/ overtyping in prices will not be accepted. However if correction/ overtyping is there, it should be attested by the tenderer with signature, date and their seal. Hand written and xerox tender will not be accepted.
21. The rates quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.
22. Machines/Equipments/Items supplied by a successful tenderer against purchase order should be successfully installed and demonstrated within the thirty days from the date of receipt of materials at institute. Delay in installation/demonstration after the above mentioned period will be liable to be penalized as per clause no.42 mentioned in the tender document summarily material may be rejected and order may be treated as cancelled as per the following procedure.
23. 100% payment will be released after the safe receipt of goods, as per the specifications given in purchase order & and after ensuring successful installation, commissioning and performance of supplied items etc.
24. Item no. and page no. of the tender form should be strictly in chronological order.
25. There should be no alternations/corrections made in the quoted rates. Rates should always be in figures and words.
26. Any Equipment/Trainers, Hardware or software breakdown must be attended within 48 hours during the warranty period of the equipment/software free of cost.
27. Item should strictly comply the standards/norms as prescribed in BIS/IS specifications.
28. Tender should be valid for at least twelve months from the date of opening the commercial bid of the tender. The price should be firm without variations of any kind.
29. The institution will issue "D" FORM duly complete and signed by the competent authority for reduction in CST at the time of final payment.

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30. Request for the supply of any details regarding quotation or comparative chart or any other enquiry in respect of the tenders received will not be entertained. Exact and earliest possible time of delivery should be indicated in the tender against each item. Other things, being equal, the tenders who give earliest delivery period will be preferred while comparing the rates. The delivery period given in the order will be the date of receipt of the equipment in the institute and not the date of dispatch of the equipment by the supplier.
31. Either a manufacturer or their authorized dealer can bid for a package(s). For each of the quoted items, appropriate documentary evidence for being a Manufacturer or their authorized dealer (Manufacturer's Authorization Form given in SECTION XII as Annexure-VI) must be submitted necessarily. In absence of above the bid will be treated non-responsive & likely may be rejected.
32. If bidden items are manufactured out of India then manufacturer's authorized distributor/agency for India may specially authorize a dealer who may participate in this tender. The relevant certificates in proof of such Authorizations and Manufacturing must be submitted.
33. The Technical specification of the Items given in the packages are as per the requirements of the curriculum of the related branches of engineering. Bidder may give equivalent / superior specification as manufactured along with the Technical details / catalogue / brochure etc.
34. Tenderer should give all relevant particulars about every item, such as maker's name Country of Manufacture and Specifications and Price etc., "Specifications as given in catalogue" quoted in tender by the tenderer will not be accepted. Full specification must be written in tender positively and should also be supported by technical literature (Catalogue/ Broachers).
35. Vague expression such as "complete with standard accessories" or "as per your specification" will not be accepted. The tenderers must specifically indicate all specification of the items and should mention clearly what item will be supplied under "accessories" with the Equipment/ Machinery in price schedule enclosed as Annexure-I. Any ambiguity or vagueness in tender for item concerned will be liable for rejection.
36. Makers stickers pasted on equipments/tools will not be accepted.
37. Catalogues/ brochures must be clear, specific and should reflect all the essential specifications of the products/ items, otherwise it will not be considered for comparison. It should be clearly indexed to reflect which item is related to which Catalogues/ brochures.

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38. Wherever requested Supplies for items in each package of the bid should be from one manufacturer only. Bids from agents offering supplies from different manufacturers, for the items of the package in the bid, will be treated as rejected.
39. The bids will be examined to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the bids are in order.
40. The tenderer will have to submit samples on demand before the technical team at the purchaser end, in the prescribed time limit. In case the samples are not produced in the prescribed time it shall be open to the undersigned to forfeit Earnest Money Deposited by the tenderers. If the samples sent by the party are approved the same will be adjusted in regular supply and in the case of rejection, they will be returned back to the party at his cost.
41. The fact that the tenderer has signed the form "A" will mean that the tenderer has completely accepted Terms & Conditions of the tender and that the tenderer agrees to abide by these Terms & Conditions of the tender. No deviation from Terms & Conditions of the tender will be accepted under any circumstances. The Terms & Conditions of the tender and clause usually printed on the party's tenders or bills will not be binding on this department.
42. The contents of the form "A" should not be changed or amended otherwise will not be acceptable by this office.
43. If the Supplier fails to deliver any or all of the Goods or to perform the services within the stipulated delivery period(s) specified in the Contract, the Principal, Institute of Technology, Korba (C.G.) shall, without prejudice to its other remedies under the Contract, forfeit the Bid Security and the order is liable to cancel.
44. If the supplier/ dealer fails to supply the items as per the specifications, items will not be received by the consignee and supplier/ dealer has to return it back on his/ her own cost. The supplier / dealer may supply the items of higher specifications (due to manufacturing obligations) if accepted by consignee after examination and testing.
45. The one time extension in the delivery period may be granted at the discretion of the undersigned. The liquidated damage at a rate of 2% per month subject to a ceiling of 10% of the contract price of the full cost of the tool/equipment/machine is liable to be charged for the extension of the delivery period. Once the maximum is reached, the Purchaser may

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consider termination of the Contract. Equipment received after the delivery period or dispatched after the delivery period mentioned in the order will also be subjected to this liquidated damage. Power to extend delivery period would remain reserved with Principal, Institute of Technology, Korba (C.G.).

46. Loading/ Unloading charges shall be borne by the supplier.
47. The undersigned may get, the items supplied by the successful tenderer, inspected on receipt of the same by such person or persons he deems fit and to reject such of these items as in his opinion do not come up to the specification. The decision of the under signed will be final in such cases. The rejected items will be returned on the tenderer's cost.
48. Warrantee/Guarantee should be for a period of 1 year minimum after delivery for the goods and its accessories.
49. All the equipments shall be suitably protected, coated, covered or boxed and crated to prevent damage or deterioration during transit/ handling and storage at site till the time of installation/ commissioning. While packing all the materials, the limitations from the point of view of availability of railway wagon sizes, in India should be taken into account. The contractor shall be responsible for any loss or damage during transportation, handling and storage due to improper packing.
50. If any Machines/Equipments require training for users, then supplier/ dealer has to arrange such training program at the destinations free of cost. Installation and working trial is to be given at site at the expenses of supplier.
51. It must be noted that normally all correspondence and transactions will be made only with the parties whose tenders have been accepted and not with anybody else.
52. The undersigned reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time without assigning any reason prior to contract award, without thereby incurring any liability to the affected bidder or bidders.
53. At any time prior to the deadline for submission of bids, the Purchaser may modify the bidding documents by amendment. All prospective bidders who have purchased the bidding documents will be notified of the amendment by uploading in the website [www.itkorba.com](http://www.itkorba.com) or by E-mail, letter or by fax and will be binding on them.
54. No offer should be made for imported item for which import license has to be arranged by the undersigned. The entire imported item will have to be delivered in the institute and payment will be made in Rupees only.



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55. Quality and price of the product will be the decisive factors for the award of tender. Merely quoting the lowest price without desired quality may lead to the consideration of next suitable tenderer.
56. Other terms and condition will be as per C.G. State Government store purchase rule.

The decision of the “Tender Committee” will be final & binding to all the bidders. Any dispute arising out of this tender or supply of any other matter will fall under the civil jurisdiction of Chhattisgarh High Court only.

Principal  
Institute of Technology  
Korba (C.G.)



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Note:- Give bid price item-wise in the following Proforma only. Any deviation will not be accepted.

### PRICE SCHEDULE

Package No....., Package Name.....

Name of Bidder.....

(Amount in `)

Item serial no.	Item Code	Specification of items, which bidder offers	Name of Accessories with specification (if any)	Make/ Brand of item	Manufacturer's Name	Catalogue/ Brochure Page No. (as indexed by you)	Quantity of item as per tender with unit	Cost per unit (Inclusive of all charges) except VAT	VAT	Total value item wise (col. 9 + col. 10)	Total Value in ` (col. 8 * col. 11)
1	2	3	4	5	6	7	8	9	10	11	12
Total package value (in words)											

Note:-

- The bidding prices shall be for F.O.R. Destination.
- Rates should be inclusive of all charges (such as charges for inspection / Demonstration / Installation/ Commissioning/ Transportation/ Excise / Custom / Services charges etc. except VAT. VAT should be mentioned separately.
- Conditional rates will not be accepted.
- Comparison will be done item wise on the basis of total values as mentioned in column 11.
- Rates will be finalized for purchase on the basis of the final total package value for all the items not on individual items. The rates quoted for total package value will be considered for comparison.
- Specifications of the item which bidder offers as per the catalogue / brochure / Technical details etc. will be considered for comparison and selection. Incomplete details will not be considered for comparison.
- Price schedule give in other form will not be accepted and bid will be rejected.

Handwritten signatures and stamps are visible at the bottom of the page, including a large signature on the right and several smaller ones on the left.

## FORM - A

(To be signed and returned along with the tender)

I/We (Full name).....

Address.....

.....

have read the Term and Condition of the tender for the supply of various stores as per your tender notice for supply of package of \_\_\_\_\_ for \_\_\_\_\_ chhattisgarh due on \_\_\_\_\_ and

I/We fully accept the Term and Condition of the Bid supplied to me / us with the Bidding Documents.

I/We also undertake to permit the It Korba to inspect our accounts and records and other documents related to the bid submission and contract performance and to have them audited by auditors appointed by the society.

It is further noted that if any manipulation is found at any stage, the tender / Contract / Supply order shall be rejected and the Principal, I. T. Korba, Chhattisgarh may take any action against me/ us, as she/ he deems appropriate.

Details of Earnest Money/ bid security in the form DD/BG @ 5% of the total tendered value for the package(s) for which bid is submitted) :

(a) DD/BG No.-----

(b) Values ` -----

(c) Name of Bank-----

Date:-----

Signature  
(Name & full Address of the firm)

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**EARNEST MONEY / BID SECURITY FORM**

To:

The Principal,  
Institute of Technology,  
Korba (C.G.)

WHEREAS.....(Name of Supplier) hereinafter called "the bidder" has undertaken, in pursuance of Tender No.....Date..... to bid in the said tender.

AND WHEREAS it has been stipulated by you in the said Tender notification that the Supplier shall furnish you with a Bank Guarantee by a schedule bank for the sum specified therein as Earnest Money/ Bid Security for compliance with the Bidders obligations in accordance with the Tender terms and conditions.

AND WHEREAS we have agreed to give the Bidder a Guarantee:

THEREFORE WE hereby affirm that we are Guarantors and responsible to you, on behalf of the Bidder, up to a total of.....(Amount of the Guarantee in words and figures) and we undertaken to pay you, upon your first written demand declaring the bidder to be in default under the Terms and Condition and without cavil or argument, any sum or sums within the limit of .....(Amount of Guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This guarantee is valid until the-----day of -----20----

Signature and Seal of Guarantors

.....

.....

.....

Date.....20.....

Address.....

.....

.....

.....  
(Signature of the Bank)

Note: The bank guarantee (submitted by Indian Bidder) should be executed on stamp paper in accordance with stamp Act. The stamp paper should be in the name of executing bank.

The bottom of the page contains several handwritten signatures in blue ink. To the right, there is a purple official stamp from the 'Korba Institute of Technology' (Korba C.G.) with a signature over it.

**PERFORMANCE SECURITY FORM**

To.

The Principal,  
Institute of Technology,  
Korba (C.G.)

WHEREAS ..... (Name of Supplier) hereinafter called "the Supplier" has undertaken, in pursuance of Contract (Notification of Award) No. .... Dated .....20..... to supply..... (Description of Goods and Services) hereinafter called "the Contract".

AND WHEREAS it has been stipulated by you in the said Contract that the Supplier shall furnish you with a Bank Guarantee by a schedule bank for the sum specified therein as security for compliance with the Supplier's performance obligations in accordance with the Contract.

AND WHEREAS we have agreed to give the Supplier a Guarantee:

THEREFORE WE hereby affirm that we are Guarantors and responsible to you, on behalf of the Supplier, up to a total of ..... (Amount of the Guarantee in Words and Figures) and we undertake to pay you, upon your first written demand declaring the Supplier to be in default under the Contract and without cavil or argument, any sum or sums within the limit of ..... (Amount of Guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This guarantee is valid until the .....day of.....20.....

Signature and Seal of Guarantors

.....  
.....  
.....  
Date.....20.....  
Address:.....  
.....  
.....

Note : The Bank Guarantee [submitted by Indian Supplier] should be executed on stamp paper in accordance with stamp paper act. The stamp paper should be in the name of executing bank.

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On Non Judicial Stamp Paper of Rs. 50/-

निविदाकर्ता द्वारा Bid के साथ दिये जाने वाला शपथ-पत्र

निविदाकर्ता फर्म मेसर्स .....की ओर से मुझे/हमें अधिकृत किया गया है और मैं/हम निम्नलिखित कथन शपथपूर्वक कहता हूँ/कहते हैं कि :-

1. मैंने/हमने निविदा की सारी शर्तें ध्यानपूर्वक पढ़ी हैं और उनसे सहमत हैं तथा उन्हें मानने के लिये वचनबद्ध हैं।
2. मेरे/हमारे द्वारा संलग्न किये गये सभी दस्तावेज सही हैं और उनमें किसी प्रकार की कांट-छांट नहीं किया गया है एवं गलत जानकारी नहीं दी गई है।
3. मेरे/हमारे द्वारा कामर्शियल बिड में सामग्रियों के लिये जो स्पेशिफिकेशन दिया गया है और उनके सपोर्ट में जो भी संबंधित दस्तावेज, कैटलॉग/ब्रोशर्स आदि संलग्न किये गये हैं उनमें लिखा विवरण निर्माता द्वारा जारी किया गया है एवं मूल रूप में हैं और उनमें कोई फेरबदल या कांट-छांट नहीं किया गया है।
4. मेरे/हमारे द्वारा निर्माता से मुझे/हमें जारी आर्थोराइजेशन प्रमाण पत्र जो कि बिड के साथ संलग्न किये गये हैं वे सही एवं मूल रूप में हैं और उनमें कोई फेरबदल नहीं किया गया है।
5. मैं/हम दिये गये क्रयादेशानुसार सामग्रियों को निर्धारित समय सीमा में स्पेशिफिकेशन के अनुसार सप्लाई करने के लिये बाध्य हैं। देर होने या सामग्रियों के स्पेशिफिकेशन में अन्तर होने पर मुझे/हमें दिये गये क्रयादेश को निरस्त किया जा सकता है एवं शासन को होने वाले नुकसान की भरपाई मेरे/हमारे द्वारा की जायेगी।
6. मेरे/हमारे द्वारा दी गई जानकारी असत्य पाये जाने पर मुझ/हमें एवं हमारी फर्म को निविदा में भाग लेने से वंचित किया जा सकता है।

दिनांक .....

हस्ताक्षर : .....

नाम : .....

धारित पद : .....

फर्म का नाम : .....

(सील सहित)

Handwritten signatures and stamps are visible at the bottom of the page, including a large signature on the right and several smaller ones on the left, along with a circular stamp.

**SECTION XII****MANUFACTURERS' AUTHORIZATION FORM\***

No. \_\_\_\_\_ Dated \_\_\_\_\_

To

Principal,  
Institute of Technology,  
Korba (C.G.)

Dear Sir:

Tender no \_\_\_\_\_ Dated \_\_\_\_\_

We.....who are established and reputable manufacturers of (name and description of goods offered) having factories at(address of factory) do hereby authorize M/s(Name and address of Agent) to submit a bid, and sign the contract with you for the goods manufactured by us against the above IFB.

No company or firm or individual other than M/s.....are authorized to bid, and conclude the contract for the above goods manufactured by us, against this specific Tender. (This para should be deleted in simple items where manufacturers sell the product through different stockiest.)

Yours faithfully,

(Name)  
(Name 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 legally bind the manufacturer. It should be included by the Bidder in its bid.

\* Modify this format suitably in case where manufacturer's warranty and guarantee are not applicable for the items for which bids are invited.



Handwritten signatures and stamps are visible at the bottom of the page, including a large signature on the right and several smaller ones on the left.

# INSTITUTE OF TECHNOLOGY , KORBA (C.G.)

## DETAILS OF PROPOSED PROCUREMENT UNDER SHOPPING MODE

Sr. No.	Package No.	Package Name
1	1	Environmental Engg. Lab.
2	2	Concrete Technology Lab.
3	3	Geotech Engg.-I Lab
4	4	Geotech Engg.-II
5	5	Transportation Engineering
6	6	Fluid Meachnics
7	7	Engineering Geology
8	8	Structural Engg & Analysis
9	9	Surveying Field Work Lab
10	10	Computer Science & Engg Lab
11	11	Analog Electronics Lab
12	12	Advanced communication Lab
13	13	Basic Electronics Lab
14	14	Microprocessor Lab
15	15	Advanced Microprocessor Lab
16	16	Linear Integrated Circuits Lab
17	17	Digital Signal Processing Lab
18	18	Utilisation of Electrical Energy Lab
19	19	Machine Lab
20	20	Power system protection Lab
21	21	Power system simulation Lab
22	22	Center Lathe
23	23	Universal Milling Machine
24	24	Shaper Machine
25	25	Wooden Lathe
26	26	Welding shop
27	27	Robotics Lab
28	28	CNC Lab
29	29	Physics Lab
30	30	Chemistry Lab
31	31	Hostel Furniture
32	32	Networking & Wi-Fi

The bottom of the page features several handwritten signatures in blue ink. To the right, there is a purple circular stamp with text in Hindi, including 'मुख्यालय' (Main Office) and 'कक्षा (क. १०)' (Class (K. 10)).

# INSTITUTE OF TECHNOLOGY, KORBA

## Schedule of Requirements

### Package No.- 01

Package Name :- Environmental Engg.

S.NO.	Code	EQUIPMENT REQUIRED	DETAILS OF SPECIFICATION	Qty.
1	C_ENV_01	digital Microscope	<p>Specification: Basic Functions</p> <p>Camera Imaging device 1/1.8 inch 2.11 megapixel CCD</p> <p>Scanning Mode Progressive scan</p> <p>Total number of pixels Approx. 2.01 megapixels 1688 (H) x 1236 (V)</p> <p>Number of effective pixels Approx. 2.01 megapixels 1688 (H) x 1236 (V)</p> <p>Frame rate 30 fps (15 fps, double buffer method)</p> <p>Electronic shutter AUTO(1/15 ~ 1/15000), 1/15000, 1/8300, 1/5800, 1/4400, 1/3600, 1/2500, 1/1000, 1/500, 1/250, 1/125, 1/60, 1/30, 1/15</p> <p>Slow shutter 1/7.5, 1/4, 1/2, 1, 2, 4, 8, 16</p> <p>Gain AUTO.MANUAL, OFF</p> <p>White balance AUTO, MANUAL (R, B)</p> <p>LCD monitor Image adjustment Gamma correction, color correction, edge enhancement</p> <p>Display size 15" LCD color monitor</p> <p>Pixel pitch 0.1905mm(H)×0.1905mm(V)</p> <p>Number of pixels 1600(H)×1200(V)</p> <p>Brightness 200cd/m2(typ.)</p> <p>Contrast ratio 500:1(typ.)</p> <p>Light source Viewing angle 170°[H], 170°[V] (type.)</p> <p>Lamp 60 W metal halide lamp</p> <p>Lamp life 4000 H (average)</p> <p>Color temperature 5500±100K</p> <p>Output Analog RGB output UXGA, SXGA, XGA</p> <p>Printer output USB2.0(B type)±ictBridge</p> <p>LAN 10BASE-T/100BASE-TX/1000BASE-T</p> <p>External terminal Round 6 pin</p> <p>ACS terminal Round 10 pin</p> <p>Remote control RS-232C connector</p> <p>Input Mouse and keyboard input USB 2.0 (Type A)</p> <p>USB ports USB 2.0 (Type A) × 6</p> <p>Microphone input MIC jack</p> <p>Record Recording media 160 GB hard disk, CD-R/RW, DVD±R/+R DL/±RW/-RAM</p> <p>Still image format Exif-TFF [non-compressed], BMP [non-compressed], Exif-JPEG [compressed]</p> <p>Compression mode JPEG [4 levels]</p> <p>Number of recorded still pixels Standard: 1600x1200, 1280x960, 1024x768, 800x600, 640x480, 320x240</p> <p>High resolution: 6400x4800, 4800x3600, 3200x2400, 2400x1800</p> <p>Video image format AVI [non-compressed]</p> <p>Number of recorded video pixels 1600x1200(7.50FPS), 1280x1024(7.50FPS), 1024x768(15.00FPS), 800x600(15.00FPS), 640x480(15.00FPS)</p> <p>Image adjustment Contrast, edge enhancement, noise reduction, binarizing</p> <p>Rated voltage AC100 ~ 240V, 50/60Hz</p> <p>Power consumption 250W</p> <p>Ambient temperature 50°C to 40°C (No freezing or condensation)</p> <p>Storage temperature -15°C to 50°C (No freezing or condensation)</p> <p>Relative humidity 25 to 85% RH (No condensation)</p> <p>Atmosphere Corrosive gas prohibited</p> <p>Weight Main Unit Approx. 12 kg</p> <p>Camera Approx. 1kg</p> <p>Size LCD shut 417.4(W)x154(H)x343.1(D)mm</p> <p>LCD open 417.4(W)x429.6(H)x343.1(D)mm</p>	1

S.NO.	Code	EQUIPMENT REQUIRED	DETAILS OF SPECIFICATION	Qty.
2	C_ENV_03	Spectrophotometer	<p>Dual Beam UV Visible Spectrophotometer with a fixed slit of 2nm. PCMA cards for quantitative analysis, scanning, kinetics and DNA.can be interfaced to a PC via UV Spec Software. The system is supplied with an 8 cell motorized cell changer as standard.</p> <p>Specifications:</p> <ul style="list-style-type: none"> <li>•Dual beam UV-Vis spectrophotometer</li> <li>•Wavelength Range: 190-1100nm, Spectral bandwidth: 2nm</li> <li>•Wavelength accuracy: <math>\pm 1\text{nm}</math>, Wavelength repeatability: <math>\leq 0.2\text{nm}</math></li> <li>•Photometric accuracy: <math>\pm 0.3\%T</math>, Photometric repeatability: <math>\leq 0.15\%T</math></li> <li>•Stray light: <math>\leq 0.05\%T</math> at 220nm(Nal) and at 340nm(NaNO<sub>2</sub>)</li> </ul> <p>Dual Beam Visible range Spectrophotometer with a fixed slit of 2nm has a small footprint and has pre-programmed PCMA cards for quantitative analysis, scanning, kinetics and DNA,can be interfaced to a PC via UV Spec Software. The system is supplied with an 8 cell motorized cell changer as standard.</p> <p>Specifications Optics</p> <p>Wavelength range 185.0 to 900.0 nm</p> <p>Monochromator Aberration-corrected Czerny-Turner mounting</p> <p>Bandwidth 0.2, 0.7, 1.3, 2.0L nm (4-step automatic switching)</p> <p>Detector Photomultiplier tube</p> <p>Optics • Flame: optical double beam</p> <p>• Furnace: high-throughput single beam</p> <p>Background correction • BGC-SR (high-speed self-reversal method)</p> <p>• BGC-D2 (D2 lamp method)</p> <p>Number of HC lamps 6-lamp turret, 2 lamps simultaneously lit (1 for measurement, 1 warming up for next measurement)</p> <p>Lamp mode EMISSION, NON-BGC, BGC-D2, BGC-SR</p> <p>Data processing</p> <p>Software requirements Microsoft Windows Vista Business / XP Professional</p> <p>Parameter setting Wizard method</p> <p>Measurement mode Flame continuous method, flame single drop method, furnace method</p> <p>Concentration computation mode • Calibration curve method (select primary, secondary, tertiary)</p> <p>• Standard addition method, simple standard addition method (primary expression)</p> <p>Repeat analysis Up to 20 repetitions. Mean value, standard deviation (SD) and coefficient of variation (RSD) displayAutomatic exclusion of deviant values by setting SD and %RSD</p> <p>Baseline correction Automatic correction of baseline drift by offset correction in peak height / peak area modes.</p> <p>Signal processing segment setting Signal processing segments can be changed in peak height / peak area modes.</p> <p>Sensitivity correction Automatic calibration curve correction function using sensitivity monitoring</p>	1

S.NO.	Code	EQUIPMENT REQUIRED	DETAILS OF SPECIFICATION	Qty.
			<p>analog output 2 channels (atomic absorption/energy signal, background signal) Output range: 5.0, 2.5, 1.25, 0.625 Abs./V (each settable in 4 stages) Fixed at 1 V F.S. in EMISSION mode.</p> <p>Tabular data processing Final concentration calculations based on sampled volume, dilution rate, fixed volume, and factor inputs</p> <p>Recall of parameters Template functions available</p> <p>Procedure/result display MRT (Measurement Results Table) worksheet</p> <p>Report generation Summary report available</p> <p>QA/QC Select whether to continue or discontinue measurements based on results of evaluation on coefficient of correlation, %RSD, ICVYICB, CCVYCCB, PB, LCS, SPK, PDS, and DUP.</p> <p>Re-analysis • Select whether on not to conduct re-analysis.</p> <p>• Automatic dilution and re-analysis of unknown samples via autosampler (flame single drop method, furnace method)</p> <p>Digital recording • Management by login ID and password</p> <ul style="list-style-type: none"> <li>• Control user access authority by user level</li> <li>• Log record</li> <li>• Audit trail</li> <li>• Electronic signatures</li> </ul> <p>Power requirements 120 VAC (English Ver.), 220 VAC (Chinese Ver.), or 230 VAC (English Ver.), 230 VA, 50/60 Hz Power is required separately for the personal computer.</p> <p>Dimensions and weight AA-7000F: 700 W x 588 D x 714 H mm, 72 kg AA-7000G: 700 W x 580 D x 538 H mm, 65 kg (Protruding parts and optional equipment are not included.)</p> <p>Ambient temperature / humidity 10 to 35 °C, 20 to 80% (less than 70% when temperature is higher than 30 °C)</p> <p>With all accessories and anti vibration mounting pad and as per I.S standards.</p>	
3	C_ENV_06	MICROPROCESSOR DIGITAL CONDUCTIVITY METER	<p>DISPLAY : 16 X 2 Alpha Numeric LCD Display</p> <p>RANGE : 0.1 µS to 100mS (6 Decadic Ranges)</p> <p>RESOLUTION : 0.01 µS.</p> <p>ACCURACY : ± 1% of F.S. ± 1 Digit</p> <p>CALIBRATION : Auto / Manual.</p> <p>TEMPERATURE COMP. : 0 to 100 UC.</p> <p>CELL CONSTANT : 0.1 To 5.0 Adjustable.</p> <p>SENSOR : Up to 100 Samples.</p> <p>POWER : 230V ± 50 Hz. AC.</p>	1
4	C_ENV_07	DIGITAL WATER & SOIL TESTING KIT	<p>DIGITAL WATER &amp; SOIL TESTING KIT (MODEL SL-EE-013)</p> <p>DISPLAY : 3.5 Digit LED</p> <p>PH: RANGE : pH 0 TO 14.00</p> <p>RESOLUTION : pH 0.01</p> <p>ACCURACY : pH 0.01 ± 1 Digit</p> <p>TEMP. COMP. : 0 to 100 Deg. C.</p> <p>ORP: RANGE : 0 to ± 1999mV</p> <p>RESOLUTION : 1mV.</p> <p>ACCURACY : 1mV ± Digit.</p> <p>CONDUCTIVITY: RANGE : 0 to 200M Mhos / Cm in 4 ranges.</p> <p>RESOLUTION : 0.1 µ Mhos / Cm</p> <p>ACCURACY : 0.5% of Range ± 1 Digit</p> <p>CELL CONSTANT : 0.4 to 1.5 on Display</p> <p>TDS: RANGE : 0 to 200M Mhos / Cm in 4 ranges.</p> <p>RESOLUTION : 0.1 ppm</p> <p>ACCURACY : 0.5% of Range ± 1 Digit</p> <p>CELL CONSTANT : 0.4 to 1.5 on Display</p> <p>DO: RANGE : 0 to 20ppm</p> <p>RESOLUTION : 0.1 ppm.</p> <p>ACCURACY : 0.2ppm ± 1 Digit</p> <p>TEMP. COMP. : 5 deg C to 55 deg C.</p> <p>SENSOR : Gold / Silver Amperometric Probe.</p> <p>TEMPERATURE: RANGE : 0 to 100Deg.C</p> <p>RESOLUTION : 0.1 Deg.C.</p> <p>ACCURACY : ± 0.2% of range ± 1 digit.</p>	1



**INSTITUTE OF TECHNOLOGY, KORBA**  
**Schedule of Requirements**  
**Package No.- 02**

**Package Name :-Concrete Technology**

S.NO	Code	NAME OF PRACTICAL	EQUIPMENT REQUIRED	DETAILS OF SPECIFICATION	QUANTITY
1	C_Conc_01	Determination of Strength of concrete	Concrete Cubes (15 x 15 x 15) cm <sup>3</sup> ,	Mould Cast iron, for 15cm cube 155 with "ISI" mark. accuracy and finished to within 0.02mm.	6
			Tray (1000 x 2000) cm <sup>2</sup> ,	as per is standerd	6
			Tray (45 x 60) cm <sup>2</sup> ,	as per is standerd	6
			Tray(60 x 60) cm <sup>2</sup>	as per is standerd	6
			Tray(30 x 45) cm <sup>2</sup>	as per is standerd	6
			Cylindrical Mould	Mould, Cylinder, Cast iron, 15cm dia x 30cm height -The mean internal diameter is within 0.2mm and height is within 1mm	6
			Graduated Glass Cylinder	(500 ml ) as per is standerd	6
			Graduated Glass Cylinder	(1000 ml) as per is standerd	6
			Beaker	(500 ml) as per is standerd	6
2	C_Conc_02	Determination of workability by Flow table test	Flow Table	Consists of a steel table top 76.2cm (30 inch.dia), finely machined. The integral cast ribs are designed for support and strength. The stand is fabricated out of cast iron and is of study construction. Holes for mounting in foundations are drilled in the base plate. The ground and hardened steel cam is designed to lift and drop the table by 12.5mm. Supplied with one conical mould with handles, 12cm. height having 17cm. top internal diameter and 25cm. I.D. at the base. Complete with a tamping rod 16mm. dia x 600 mm long one end rounded.Same as above but Electrically operated, to raise and drop the table top, approx. 15 times in 15 seconds. Suitable for operation	1
3	C_Conc_03	Determination of Deleterious materials in fine aggregate	Weighing Balance	<p>LABORATORY BALANCES</p> <p>of Electro Magnetic Force Compensation High Precision Balances Laboratory Balances from 0.01mg accuracy. These Balances specifications to meet the requirements of wide range of applications in Research &amp; QC Laboratories of Pharmaceutical, Chemical, Textile industries as well as Educational Institutions.</p> <p>HIGH PRECISION LABORATORY BALANCES ( 0.001g to 500g )</p> <p>Multiple weighing units.</p> <p>Standard bi-directional RS-232 interface</p> <p>Polyfunction : % weighing, counting, fill mode, GSM etc</p> <p>Backlite LCD/VFD display</p> <p>Density determination Kit</p> <p>Weigh below hook for density determination</p> <p>pecifications:</p> <p>Capacity 500g</p> <p>Readability 0.001g</p> <p>Repeatability (+/-) 0.002 g</p> <p>Linearity(+/-) 0.002</p> <p>Pan Size 100 mm</p>	1

S.NO	Code	NAME OF PRACTICAL	EQUIPMENT REQUIRED	DETAILS OF SPECIFICATION	QUANTITY
4	C_Conc_04	. Mix Design by I.S. Code method (with Slag Cement)	Weighing Balance	laboratory-weighting balances in electronic as well as Battery Large LCD Display Soft Touch Tack Switch Compact Design Tare & Hold Facility Double Display. AC Adaptor also. Stamping done by Weight & Measuring Deptt. Different capacities like 10 Kgs x 1 gm.,	3
5	C_Conc_05	Mix Design by I.S. Code method (with Admixtures Cement)	Weighing Balance	ANALYTICAL BALANCES (0.0001g to 230g) of Electro Magnetic Force Compensation High Precision Balances Laboratory Balances from 0.0001g accuracy. These Balances specifications to meet the requirements of wide range of applications in Research & QC Laboratories of Pharmaceutical, Chemical, Textile industries as well as Educational Institutions Multiple weighing units. Standard bi-directional RS-232 interface Polyfunction : % weighing, counting, fill mode, GSM etc Backlite LCD/VFD display Density determination Kit Weigh below hook for density determination  Specifications:  CAPACITY 220g READABILITY 0.0001g Repeatability (+/-) 0.2 mg Linearity (+/-) 0.3 mg Pan Size 80 mm	1
6	C_Conc_06	6. Determination of Compressive strength of concrete by non destructive test – Rebound Hammer	Digital Concrete Test Hammer, Rebound Hammer	•Digital Concrete Test Hammer BS 1881 -202, ASTM C805 •Digital Rebound Hammer For Concrete Compressive Strength Analysis in the Field and Material Hardness Testing digital test hammers are an advanced, completely automated system for estimating concrete compressive strength. Its calculation, memory and recording functions allow for quick, easy and accurate test results. Discard values for multiple test results can be set; the mean, median and compressive strength can also be calculated. The addition of modern microprocessor technology allows the data to be stored, printed and transferred to a personal computer for further analysis, or inclusion in your reports. The unit comes with an integrated alpha " numeric digital display, and control panel. You can switch between standard or metric units. Specifications Display: 2x16 Trans " reflective Construction: All Aluminum for rugged construction environment Operating Temperature: 0° to 50° C (32° to 122° F) Batteries: 2 "AA™ Ap. Size: 100mm x 100mm x 270mm ( 4 x 4 x 10 ) Ap. Weight: 1.6 Kg ( 3.5 lbs.) Printer Size: 64mm x 49mm x 31mm ( 2.5 x 1.9 x 1.2 ) Weight: up to 0.270 kg ( 0.6 lbs ) with paper Battery: Internal Lithium ion with 1 yr. approximate life Charger: 100VAC " 240VAC 5 VDC 3.0A Operating Temperature: 0° to 50° C (32° to 122° F) Software Windows PC Compatible / USB interface required	

# INSTITUTE OF TECHNOLOGY, KORBA

## Schedule of Requirements

### Package No.- 03

#### Package Name :-Geotech Engg.-I

S.NO	CODE	NAME OF PRACTICAL	EQUIPMENT REQUIRED	DETAILS OF SPECIFICATION	QUANTITY
1	C_GEO-I_01	To determine in situ dry density of soil by sand replacement method.	Small and Big Soil Container	Measuring Cylinders Graduated Glass & Rigid Plastic with Spout. 10ml. 25ml. 50ml. 100ml. 250ml. 500ml. 1000ml 2000ml	1
2	C_GEO-I_02	To determine the shrinkage limit of soil sample.	Shrinkage Limit Apparatus	1.Glass plate 20 cm x 115 cm having ground ends and one side frosted. 2.Brass or stainless steel rod 3 mm dia x 150 mm long. 3.Flexible spatula. 4.Set of 6 moisture containers. 5.Porcelaine basin 150 mm dia. 6.Plastic wash bottle 500ml.	1
3	C_GEO-I_03	To determine the grain size distribution by wet mechanical analysis (Hydrometer apparatus).	Hydrometer Apparatus	Hydrometer Apparatus SOIL HYDROMETER Should be used for grain size analysis of soils as per IS 2720-IV with ISI mark.high quality raw material. These instruments are marked with standard measurements. hydrometers includes: * Density hydrometers * Brix hydrometers with thermometer * Heavy liquid hydrometers * Light liquid hydrometers * Specific gravity hydrometers are required for conducting the practical : To determine the grain size distribution by wet mechanical analysis.With all accessories and ,as per I.S standards.	1
4	C_GEO-I_04	Buoyancy Apparatus	Buoyancy Apparatus	highly functional range of buoyance apparatus which is used for measuring density of hardened concrete, aggregates, bricks and other items. Our range is appreciated for high quality, optimum performance, long serviceability and other features and comprise following parts: • Balance 15 Kg x 1gm • Digital readout • Battery back-up • Fitted on table fabricated of rigid frame • Bottom platform can be raised to the desired height with locking arrangement to remain at a particle height to submerged the Cube/Brick/ Aggregate etc • Water tank fabricated using GI sheet with side handle of approx size 380 x250x280m • Complete with suspension Hook, cradle for cube etc	1
5	C_GEO-I_05	Determination of density for contaminated soil.	Measuring Jar Cylinder (1000 CC)	Beakers Graduated Glass & Rigid Plastic with Spout. Measuring Jar Cylinder (1000 CC)	3

# INSTITUTE OF TECHNOLOGY, KORBA

## Schedule of Requirements

### Package No.- 04

Package Name :-Geotech Engg.-II

S.NO	CODE	NAME OF PRACTICAL	EQUIPMENT REQUIRED	DETAILS OF SPECIFICATION	Qty
1	C_GEO-II_02	Determination of bearing capacity of soil by plate load.	Plate Load Test Apparatus with full accessories	<p>Plate Bearing Test Apparatus : IS 1888, BS1377,ASTM D1194,D 1196.</p> <p>Specifications :</p> <p>The basic outfit consists of :</p> <p>50 Tone Hydraulic jack with separate pumping unit fixed to it a 0 -500 KN. x 0.5 KN Pressure gauge and flexible metal pipe 5 meter long- 1 No. Special ball and socket arrangement between the jack and the bearing plate -1 No Extension rod 12mm. diameter x 25cm. long for taking dial gauge readings -16 Nos Magnetic base with female thread on top for holding extension rod 4 Nos Top end plate, 50mm, diameter with male thread for fitting onto the extension rods and Positioning the dial gauge plunger - 4 Nos Column 15cm. diax25cm long with flanges complete with four bolts and nuts -2 Nos Column 15cm. diax50cm long with flanges complete with four bolts and nuts - 1 Nos Bridge support of welded steel angle construction, 5 meter span and stands approximately 30cm. high. Fitted with two quick release clamps for positioning and holding the dial bracket-2 Nos Plane MS Plate 60cms x 60cms. square x 25mm thick Plane MS Plate 45cms x 45cms. square x 25mm thick Plane MS Plate 30cms x 30cms. square x 25mm thick Dial Gauge 0.01mm x 25mm.- 4 Nos</p> <p>Accessories :</p> <p>Plane M.S. Plate 75cm x 25mm thick Plane MS Plate 50cm x 25mm thick</p> <p>Grooved MS Plate 60cms x 60cms x 25mm. thick Grooved MS Plate 45cms x 45cms x 25mm. thick Grooved MS Plate 30cms x 30cms x 25mm. thick</p> <p>Grooved MS Plate 75cms x 75cms x 25mm. thick</p>	1
2	C_GEO-II_02		Digital Triaxial machine (performing laboratory CBR, Marshall stability and Quick undrained triaxial tests) Apparatus with full accessories	<p>Digital Triaxial machine (performing laboratory CBR, Marshall stability and Quick undrained triaxial tests)</p> <p>BS 598, 1377, 1924;ASTM D3668, D1883; AASHTO T193</p> <ul style="list-style-type: none"> <li>_ Large on-board LED screen display</li> <li>_ Fully variable speed, 0.5 to 50 mm/minute</li> <li>_ Rapid and momentary approach of platen</li> <li>_ Mechanical or electronic measurement</li> <li>_ Triaxial samples up to 100 mm diameter</li> </ul> <p>This 50 kN capacity machine has been designed primarily for performing laboratory CBR, Marshall stability and Quick undrained triaxial tests on one load frame. It is particularly suitable for those laboratories carrying out a mix of these tests, e.g. for road construction.The compact bench mounting design comprises a</p> <p>Specification</p> <p>Dimensions (l x w x h) 550 x 400 x 1470 mm</p> <p>Maximum vertical clearance 800 mm</p> <p>Horizontal clearance 265 mm</p> <p>Platen diameter 133 mm</p> <p>Platen travel 100 mm</p> <p>Platen speed range 0.5 to 50.0 mm/min</p> <p>Rapid approach speed 40 mm/min</p> <p>, mechanical load frame supplied complete with CBR stabilising bar.</p> <p>EL25-3700/01 for 220 – 240 V AC, 50 – 60 Hz, 1ph</p> <p>Accessories</p> <p>Electronic Control and Readout Unit</p> <p>CBR Stabilising Bar</p> <p>Platen Adaptor</p> <p>Platen Adaptor</p>	1

# INSTITUTE OF TECHNOLOGY, KORBA

## Schedule of Requirements

### Package No.- 05

Package Name :-Transportation Engineering

S.NO	CODE	NAME OF PRACTICAL	EQUIPMENT REQUIRED	DETAILS OF SPECIFICATION	Qty
1	C_TE_01	Determination of crushing value of aggregates.	Crushing Value Cylinder and Mould with Plunger	<p>Aggregate Crushing Value apparatus Should for measuring of resistance of aggregate to crushing. and consists of M.S. Cylindrical container 150mm± 0.5mm dia x 130mm to 140mm high with base plate 200 to 230 mm/sqr x 6mm thick, with tamping rod 16mm dia x 600mm long, one end rounded.</p> <p>And a Metal measure 115 ± 0.5mm dia x 180 0.5mm high. as per IS standard and ISI mark.</p> <p>Note: Materials under S.No.9 are required for conducting the practical : Determination of crushing value of aggregates.With all accessories and ,as per I.S standards.</p>	1
2	C_TE_02	Seive Anaysis	Weighing Balance ANALYTICAL BALANCES (0.0001g to 230g)	<p>ANALYTICAL BALANCES (0.0001g to 230g) of Electro Magnetic Force Compensation High Precision Balances Laboratory Balances from 0.0001g accuracy. These Balances specifications to meet the requirements of wide range of applications in Research &amp; QC Laboratories of Pharmaceutical, Chemical, Textile industries as well as Educational Institutions</p> <p>Multiple weighing units.</p> <p>Standard bi-directional RS-232 interface</p> <p>Polyfunction : % weighing, counting, fill mode, GSM etc</p> <p>Backlite LCD/VFD display</p> <p>Density determination Kit</p> <p>Weigh below hook for density determination</p> <p>Specifications:</p> <p>CAPACITY 220g</p> <p>READABILITY 0.0001g</p> <p>Repeatability (+/-) 0.2 mg</p> <p>Linearity (+/-) 0.3 mg</p> <p>Pan Size 80 mm</p>	1
3	C_TE_03	Study of Benkelman Beam.	Benkelman Beam	<p>This device was developed by U.S. Bureau of Public Roads and is used timesaver deflections of flexible pavements. The light weight instrument is supplied in two parts for assembling on site with easy hand tools. In use one end of the beam rests at a point under investigation while the beam is pivoted at the centre. The free end carries a dial gauge to record the deflections. The other end is kept on a stable platform. The beam ratio is 2:1 which magnifies even small deflections. Supplied with a dial gauge 0.01 x 25mm. This is a light weight dismount liable instrument and easy to carry.With all accessories and anti vibrating mounting pad and ,as per I.S standards.</p>	1

**INSTITUTE OF TECHNOLOGY, KORBA****Schedule of Requirements****Package No.- 06****Package Name :-Fluid Meachnics**

<b>S.NO</b>	<b>CODE</b>	<b>EQUIPMENT REQUIRED</b>	<b>DETAILS OF SPECIFICATION</b>	<b>QUANTITY</b>
1	C_FM_01	Cut Section Model of Hydraulic accumulator	Cut Section Model of Hydraulic accumulator as per IS specification	1
2	C_FM_02	Cut Section Model of Hydraulic Intensifire	Cut Section Model of Hydraulic Intensifire as per IS specification	1
3	C_FM_03	Cut Section Model of Hydraulic Crane	Cut Section Model of Hydraulic Crane as per IS specification	1
4	C_FM_04	Cut Section Model of Hydraulic Lift	Cut Section Model of Hydraulic Lift as per IS specification	1
5	C_FM_05	Cut Section Model of Hydraulic Ram	Cut Section Model of Hydraulic Ram as per IS specification	1
6	C_FM_06	Cut Section Model of Hydrolic Jet and Air lift pump	Cut Section Model of Hydrolic Jet and Air lift pump as per IS specification	1
7	C_FM_07	Fluiding devices Analog & digital	Fluiding devices Analog & digital as per IS specification	1



# INSTITUTE OF TECHNOLOGY, KORBA

## Schedule of Requirements

### Package No.- 07

Package Name :-Engineering Geology

S.No.	CODE	NAME OF EQUIPMENT	DETAILS OF SPECIFICATION	Qty
1	C_EG_01	Crystallographic Model	Crystallographic Model AS PER IS SPECIFICATION	1
2	C_EG_02	Wooden Cabinet	Wooden Cabinet AS PER IS SPECIFICATION	1
3	C_EG_03	Axis of symmetrical of 6 System	Axis of symmetrical of 6 System AS PER IS SPECIFICATION	1
4	C_EG_04	Planes of symmetrical of 6 System	Planes of symmetrical of 6 System AS PER IS SPECIFICATION	1
5	C_EG_05	Crystallographic Axis & Centre of System	Crystallographic Axis & Centre of System AS PER IS SPECIFICATION	1
6	C_EG_06	Collection of Minerals	Collection of Minerals AS PER IS SPECIFICATION	1
7	C_EG_07	Hardness Testing Knife	Hardness Testing Knife AS PER IS SPECIFICATION	5
8	C_EG_08	Model Showing Strike, Dip, Pitch	Model Showing Strike, Dip, Pitch AS PER IS SPECIFICATION	1
9	C_EG_09	Symmetrical Anticline Showing Axis-Axial Plane	Symmetrical Anticline Showing Axis-Axial Plane AS PER IS SPECIFICATION	1
10	C_EG_10	Asymmetrical Anticline Showing Axis-Axial Plane	Asymmetrical Anticline Showing Axis-Axial Plane AS PER IS SPECIFICATION	1
11	C_EG_11	Isoclinal Anticline & Syncline	Isoclinal Anticline & Syncline AS PER IS SPECIFICATION	1
12	C_EG_12	Recumbent Fold	Recumbent Fold AS PER IS SPECIFICATION	1
13	C_EG_13	Fan Fold	Fan Fold AS PER IS SPECIFICATION	1
14	C_EG_14	Model of Normal Fault	Model of Normal Fault AS PER IS SPECIFICATION	1
15	C_EG_15	Model of Reverse Fault	Model of Reverse Fault AS PER IS SPECIFICATION	1
16	C_EG_16	Ridge & Trough Fault	Ridge & Trough Fault AS PER IS SPECIFICATION	1
17	C_EG_17	Step Fault	Step Fault AS PER IS SPECIFICATION	1
18	C_EG_18	Wooden Specimen Tray	Wooden Specimen Tray AS PER IS SPECIFICATION	20
19	C_EG_19	<b>Polarizing Petrological Microscope</b>	<p>polarizing microscope includes the following:</p> <p>Objective Lenses: DIN Infinity Corrected Optical System (ICOS) Strain Free Plan 4x, 10x and s40x mounted in smooth-operating, ball bearing mounted, quintuple nosepiece.</p> <p>Viewing Head: Siedentopf-type binocular head or trinocular head for camera integration. Each head has the eyetubes inclined at 30° with the left eyetube having graduated diopter settings. The interpupillary distance is adjustable between 53mm - 75mm. An 80/20 beamsplitter for the trinocular tube can be engaged for photo work. (100% to eyetubes or 80% to phototube &amp; 20% to the eyetube.) 30mm ID eyetube.</p> <p>Eyepieces: One KHW10xCP Focusing eyepiece with guide pin and cross-line reticle and one widefield compensating eyepiece F.N. 20 are standard with a 21mm reticle mount. Tube O.D. 23.2mm.</p> <p>Total Magnification: 40x, 100x, 400x.</p> <p>Specimen Stage: Ceramic-coated 360 degree rotatable fully indexed stage with vernier and stage clips. Stage is 175mm in diameter.</p> <p>Illumination: Transmitted Koehler 6v 30w halogen illumination.</p> <p>Condenser: Strain Free Abbe N.A. 1.25 condenser with iris in dovetail mount.</p> <p>Focusing: Ergonomically low positioned coaxial focusing controls allow the operator to work with their forearms relaxed on the working surface. Range of travel is 23mm. Rotation of fine focus is 0.2mm per revolution.</p> <p>Included: Microscope includes Micro 1/4 wave plate, first order red</p>	1

S.No.	CODE	NAME OF EQUIPMENT	DETAILS OF SPECIFICATION	Qty
20	C_EG_20	Resistivity meter	<p>Resistivity Meter, depths to 200m Features:</p> <ul style="list-style-type: none"> <li>• Measures voltage &amp; current simultaneously</li> <li>• 200 W new Output Power</li> <li>• 1200 V Peak to Peak</li> <li>• 2.5 A Maximum Current</li> <li>• Automated Electrode Switching System Available</li> <li>• 20 Bit A/D Converter</li> <li>• Chargeability / IP Measurements</li> <li>• Resolution: 10µA</li> <li>• Accuracy: 0.3%</li> <li>• Max. Output Current: 2.5 A</li> <li>• Max. Output Power: 200 W new</li> <li>• Maximum Output Voltage: 600V (1200V peak to peak)</li> <li>• Pulse Duration: 0.5s, 1s and 2s</li> </ul> <p>Receiver:</p> <ul style="list-style-type: none"> <li>• Voltage Measurement Specifications:</li> <li>• Resolution: 1 µV after stacking</li> <li>• A/D Converter: 20 Bit</li> <li>• Accuracy: 0.3%</li> <li>• Output Impedance: 10 MOhms</li> <li>• Input over voltage protection</li> <li>• Input Voltage Range: ± 10V</li> <li>• Automatic SP Bucking: (±10V) with linear drift correction (up to 1 mV/s)</li> <li>• 50Hz and 60Hz power line rejection</li> <li>• Continuous Digital Stacking : Up to 250 stacks</li> </ul> <p>Miscellaneous:</p> <ul style="list-style-type: none"> <li>• LCD display of 2 lines, 20 characters</li> <li>• Weather resistant case</li> <li>• Dimensions: 21 x 31 x 21 cm</li> <li>• Weight: 9.5kg, including battery</li> </ul> <p>internal 12V 7AH Rechargeable battery &amp; external 12V Operation Temp rang -20 C to +70 Centigrade</p>	

# INSTITUTE OF TECHNOLOGY, KORBA

## Schedule of Requirements

### Package No.- 08

#### Package Name :-Structural Engg & Analysis

S.NO	CODE	NAME OF EQUIPMENT	DETAILS OF SPECIFICATION	Qty
1	C_SEA_01	Elastic properties of beam apparatus	A mild steel beam 2.5 cm x 3 mm in cross section and 100 cm long is pinned to two supporting 70cm one of the beam can be fixed or given a known slope by applying a known moment at the end with the help of suspended load at the other end also a known moment can be applied at various points along the pan of the beam. A dial gauge with 25mm travel (with a magnetic base) is supplied with the apparatus.supplied with the apparatus.With all accessories and anti vibrating mounting pad and ,as per I.S standards.	1
2	C_SEA_02	Maxwell's law of reciprocal deflection apparatus	Apparatus consisting of a beam 100 cm long and 12.5 cm x 5 mm in cross section with graduations every 70 cm apart with a 30 cm over hang on the one side a dial guage with base should also be A dial gauge with 25mm travel (with a magnetic base) is supplied with the apparatus.supplied for measurement the deflectionWith all accessories and anti vibrating mounting pad and ,as per I.S standards.	1
3	C_SEA_03	1. Universal frame with variety of curved bars.	<p>T electro-mechanical universal testing machines are used in a wide range of applications in strength of materials for static tests. The test machines accept many types of materials and components as well as complete assemblies and structures.</p> <p>The EM1100 is an industrial design electro-mechanical testing machine with a capacity of 100 kN in traction and compression, adapted for the particular needs of engineering colleges, research and quality control.</p> <p>Tests may be carried out as a function of speed, stress or strain.</p> <p>The analogue/digital interface and the software provided with the EM1100 form a complete package allowing control, data acquisition and analysis using a PC. The advanced, user-friendly software is presented in toolbox form that demands no particular programming knowledge.</p> <p>Data analysis and presentation can be effected off-line. Data from current and previous runs may be transferred as ASCII files for use with spreadsheet and other software.</p> <p>The universal test machine allows a wide range of tests, including :</p> <ul style="list-style-type: none"> <li>- Tension, compression and bending</li> <li>- Cycling up to 1 Hz</li> <li>- Fretting and fatigue</li> <li>- Standard specimen testing</li> <li>- Creep testing</li> <li>- Assembly and structure tests</li> </ul> <p>Fully computer-controlled via PC</p> <ul style="list-style-type: none"> <li>- Specific interface :</li> <li>4 channels</li> <li>Acquisition and control : 12 bits</li> <li>- Force range : 0 to 100 kN Traction and Compression</li> <li>- Speed range : 0.005 mm/min to 400 mm/min</li> <li>- Drive system : Brushless motor with twin recirculrecirculating ball screws</li> <li>- Maximum crosshead travel : 1200 mm</li> <li>- Horizontal clearance : 600 mm</li> <li>- Extension measurement : integral crosshead movement encoder. Resolution : 0.01 mm</li> <li>- Full control of all test functions and analysis from PC. Software packages for full crosshead control (traction, compression, flexion, cycling, creep, stress and strain rate)</li> </ul> <p>Dial gauges for measuring deflections.</p> <p>Weights and hangers to apply loads</p>	1

S.NO	CODE	NAME OF EQUIPMENT	DETAILS OF SPECIFICATION	Qty
4	C_SEA_04		<ul style="list-style-type: none"> <li>- Strain gauge load cell Capacity <math>\pm 100</math> KN - grade 1 (other on special requirement)</li> <li>- Display of the de strength and the displacement on screen</li> <li>- Extensometer input compatible with all LVDT or strain gauge extensometers</li> <li>- Conform to EMC regulation.</li> </ul> <p>EQUIPMENT PACKAGE</p> <p>Standard equipment for EM1100</p> <ul style="list-style-type: none"> <li>- Universal test machine of 100 kN capacity</li> <li>- Analogue/digital interface</li> <li>- Control and acquisition software</li> <li>- Technical manul</li> </ul> <p>1180 x 800 x 2200 mm</p> <ul style="list-style-type: none"> <li>- 380 V three phase, 50 Hz, 3.5 kW</li> <li>- Personal computer, IBM compatible with RS232 free port</li> </ul> <p>Additional required equipment :</p> <ul style="list-style-type: none"> <li>- Strain-gauged load cells with capacities 100 kN or others ref EM6110</li> <li>- We can offer the following precision extensometers :</li> </ul> <p>LVDT induction extensometer Lo 25 to 200 mm dL 10 mm ref V25/10</p> <p>Strain gauge extensometer ref EI602</p> <p>Other extensometers may be adapted for particular requirements</p> <p>One set of wedge grip 100 kN, Ref. TH109-100</p> <p>One set of flat jaws 1x45° pyramid 0-20 mm, Ref. TH109-EBP20</p> <p>One set of jaws for samples Ø 5-20 mm, Ref. TH109-EBV20</p> <p>Dial gauges for measuring deflections.</p> <p>Weights and hangers to apply loads</p>	
5	C_SEA_05	variety of portal frames	<p>Apparatus consists of 4 panels of a PRATT truss, each panel being 40cm in horizontal direction and 30cm in vertical direction. Load can be applied on each panel point. All tension members are provided with detachable springs so as to obtain appreciable deformation of the member. Direction of the diagonal members may be changed .</p> <p>Apparatus can be used to illustrate visually the nature of forces set up in various members of the Truss. Apparatus is supplied complete with a supporting stand and a set of weights.</p>	1

S.NO	CODE	NAME OF EQUIPMENT	DETAILS OF SPECIFICATION	Qty
6	C_SEA_06	Digital Strain Indicator	<p>Digital Strain Indicator - Multi Channel 10 Channel Digital Strain Indicator</p> <p>Digital Strain Indicator - Multi Channel 10 Channel Digital Strain Indicator</p> <p>SPECIFICATIONS</p> <p>Range : 0 to <math>\pm</math> 19999 microstrains directly using 4 <math>\frac{1}{2}</math> digit panel meter.</p> <p>Frequency Response: DC to 10,000 Hz</p> <p>Accuracy: <math>\pm</math> 1 Digit.</p> <p>Input configurations 1, 2, and 4 arms strain gauge networks. (quarter, half and full bridge networks).</p> <p>Resistance of Strain Nominal 120 Ohms, 300 Ohms. 600 Ohms in 1,2,4 gauge usable arm active networks and other values in 2&amp;4 arm active network.</p> <p>Bridge Balance Ten Turn Potentiometer permits to get bridge balanced against difference in gauge resistances used upto <math>\pm</math> 1.5%.</p> <p>Calibration and A calibration switch and circuit is provided either to calibrate or compensate a preload. This circuit produces signal</p> <p>Compensation Facility equivalent to 10000 microstrains. This also facilitates the user to study a very small dynamic strain over and above large static strain level.</p> <p>Bridge Excitation 5 Volts DC Stabilized.</p> <p>Gauge Factor Adjustment 1.5 to 4.5 continuous.</p> <p>Indication Digital Panel Meter - 4 <math>\frac{1}{2}</math> digit.</p> <p>Power Supply 230 Volts. 50Hz AC</p> <p>Mains measuring systems and graphical menu driven software with data logging, data storage, real-time data display, real-time plotting, data retrieval, data analysis, graphing features. Almost all of our strain measuring systems can be computerized.</p>	1
7	C_SEA_07	Latest Release of Software Package SAP2000 (Computers & Structures Inc., USA)	10 users	1
8	C_SEA_08	Latest Release of Software Package ANSYS (ANSYS Inc., USA)	10 users	1

**INSTITUTE OF TECHNOLOGY, KORBA**

**Schedule of Requirements**

**Package No.- 09**

**Package Name :-Surveying Field Work Lab**

S.No	CODE	NAME OF EQUIPMENT	DETAILS OF SPECIFICATION	Qty
1	C_SUR_01	Abney Level	<p>The abney level is an engineering instrument which can be used to determine height. It is moderately expensive and of medium size and weight. Although the abney level is relatively robust, the bubble tube can be knocked out of alignment during rough treatment. Angle of inclination of a line from the observer to the target.</p> <p>Specifications</p> <p>Used to determine slope angle, tree heights etc</p> <p>Graduated 0-+/-90 degrees, 0-+/-100% on a stationary arc</p> <p>Vernier reads to 10'</p> <p>Scale pointer incorporates friction thumb lock</p> <p>Includes leather carry case with belt loop</p> <p>With all accessories and as per I.S standards.</p>	1
2	C_SUR_02	Tilting Level	<p><b>Features Of Tilting Level</b></p> <ul style="list-style-type: none"> <li>• Internal focusing telescope having 3 foot screws leveling base with locking arrangement <ul style="list-style-type: none"> <li>• Screw focusing eye piece</li> <li>• Highly sensitive spirit bubbles</li> <li>• Aperture not less than 3.76 cm</li> </ul> </li> <li>Fitted With <ul style="list-style-type: none"> <li>• Compass</li> <li>• Reader</li> </ul> </li> <li>• Longitudinal bubble that is mounted with folding reflector fitted along with a telescopic tube</li> </ul> <p>Specifications</p> <p>Telescope Image Erect/Invert</p> <p>Magnification 24x</p> <p>Length 175mm</p> <p>Shortest Focusing Distance 1.5mtr</p> <p>Longest Focusing Distance 200/300 mtr.</p> <p>Objective Aperture 40 mm</p> <p>Stadia Constant 1:100</p> <p>Addition Constant 0</p>	1



S.No	CODE	NAME OF EQUIPMENT	DETAILS OF SPECIFICATION	Qty
3	C_SUR_03	Electronic Digital Theodolite	<p> angle measurements (Hz, V)  Precision 2"  Display resolution 1 or 5"  Display units DEG (360o 00' 00"), GON (400), MIL (6400), V / %  Telescope  Magnification 30x  Objective aperture 45 mm (1.7 in)  Minimum focusing distance 1.35 m (4.43 ft)  Stadia multiplication factor/constant 100/0  Compensator  System Automatic vertical compensator, User set On/Off  Working Range <math>\pm 3'</math>  Operation  Display Double side large character back-lit LCD  Keys 6 one touch button functions  Laser plummet  Type Visible laser point  Accuracy 1.5 mm at 1.5 m instrument height  Environmental conditions  Operating temperature -20o C ~ +50° C  Protection to dust and water Dust and water resistant, IP54  Weight  Weight including battery and tribrachv 4.5 kg (9.9 lb)  Battery/Power Management  Type of battery Rechargeable NiMH, replacement alkaline battery pack  Operation period without laser plummet 36 h Dust and Water resistance  Carrying case  • Plumb bob  • User-manual.levelling staff ,tripod </p>	1
4	C_SUR_04	Auto level	<p> Telescope  Image E rect  Magnification 30x  Objective Aperture ol 30 mm  Resolving Power 3"  Field of view 1°20'  Minimum Focus Distance 0.3 m  Stadia ratio 100  Stadia constant 0  Accuracy  Standard Deviation of lkm  double run leveling 1.5 mm 1.5 mm 2 mm  Automatic Compensator  Working range <math>\pm 15'</math>  Type Magnetic  Circular Vial  Sensitivity 8' / 2mm  Horizontal Circle  Minimum division 1°  Reading system T otal area 360°  Size and Weight  Dimensions 130mm x 140mm x L 200mm  Dust and Water resistance  Carrying case  • Plumb bob </p>	1

S.No	CODE	NAME OF EQUIPMENT	DETAILS OF SPECIFICATION	Qty
5	C_SUR_05	Total Station	<p>SPECIFICATIONS OF TOTAL STATION</p> <ol style="list-style-type: none"> <li>1. Telescope <ol style="list-style-type: none"> <li>i. Image - Erect</li> <li>ii. Magnification <math>\geq 30\times</math></li> <li>iii. Field of view <math>\geq 22\text{m}@1000\text{m}</math></li> <li>iv. Minimum focus distance <math>\leq 2.0\text{m}</math></li> <li>v. Resolving power <math>\leq 2.5''</math></li> </ol> </li> <li>2. Angle measurement <ol style="list-style-type: none"> <li>i. Tilt compensation method – dual axis</li> <li>ii. Tilt compensation range <math>\geq 3''</math></li> <li>iii. Angle accuracy <math>\leq 2''</math> horizontal and vertical</li> <li>iv. Displayed resolution (Least count) <math>\leq 1''</math></li> </ol> </li> <li>3 Distance measurement <ol style="list-style-type: none"> <li>i. Range (20 km visibility) <math>\geq 1500\text{m}</math> with 1 prism &amp; <math>\geq 3000\text{m}</math> with assembly of 3 prisms.</li> <li>ii. Accuracy (in static mode) <math>\leq 5\text{mm}+3\text{ppm}</math> of distance)</li> <li>iii. Resolution (Least count) <math>\leq 1\text{mm}</math></li> <li>iv. Measurement time <math>\leq 5\text{s}</math></li> <li>v. Prism –Retro reflective type</li> </ol> </li> <li>4. Optical plummet <ol style="list-style-type: none"> <li>i. Magnification <math>\geq 2.0\times</math></li> <li>ii. Focusing range <math>\leq 0.5\text{ to } \geq 2\text{m}</math></li> <li>iii. A small Bull's eye Bubble on alidade.</li> </ol> </li> <li>iv. Two Electronic bubbles <math>30'</math> sensitivity at right angles to each other on display panel.</li> <li>v. One Circular Bubble on Tribrach.</li> </ol> <p>Contd</p> <p>Key board and display – Alpha Numeric keyboard on both sides (identical). Display: 1/4 VGA (320*240 pixels) graphic LCD colour illumination. Touch screen Keyboard: (function conditions, marking on keys are clear and non-removable. Graph or entire survey displayed on screen of Total Station with Zoom &amp; Pan facility.</p> <p>6. Pressure &amp; Temperature sensors – In built Temperature &amp; pressure Sensors for measurement and display of instant atmospheric temperature and pressure in SI system of unit.</p> <p>7. Accessories – Total station should have following original accessories showing company's mark on it in strong carrying case with Data Transfer Cable. Data Transfer Software. Two rechargeable Batteries, One Charger, One CD containing Instruction Manual. Two Single prism with Target Plate and one wooden stand Range, Two pole, Two display, Two Detachable Tribrach, lens cover set, cleaning brush, cover of durable plastic, shock absorbing carrying case with shoulder strap etc in complete.</p> <p>8. Data storage (with pc-software for data retrieval, presentation and archiving)</p> <ul style="list-style-type: none"> <li>• Capacity <math>\geq 10000</math> points on board memory or more</li> <li>• SD Card/CF card slot with 256 MB or more</li> <li>• RS232/USB Interface</li> </ul> <p>9. Focusing Mode:</p> <p>Three Focusing Mode viz.</p> <ol style="list-style-type: none"> <li>b) Auto Focus mode</li> <li>c) Power Focus mode</li> <li>d) Manual Focus mode</li> </ol> <p>10. Physical</p> <ol style="list-style-type: none"> <li>i. Weight <math>\leq 10\text{kg}</math></li> <li>ii. Temperature range <math>\leq 0</math> to <math>\geq 55^\circ\text{C}</math> fully operational</li> <li>iii. Humidity 0 to <math>\geq 90\%</math> RH</li> <li>iv. Protection splash waterproof and dustproof</li> </ol> <p>11. Power</p> <p>. Batteries Li-ion rechargeable, no memory effect, during changing of batteries.</p> <ol style="list-style-type: none"> <li>ii. Capacity <math>\geq 4</math> hours of continuous measuring</li> <li>iii. Battery charger, adaptor and cables</li> <li>iv. Recharge time <math>\leq 2</math> hours</li> <li>v. Power supply 220 VAC <math>\pm 25\%</math>; 47 to 53Hz</li> <li>vi. Operating temperature 0 to <math>55^\circ\text{C}</math></li> <li>vii. Humidity 0 to <math>\geq 90\%</math> RH</li> </ol> <p>12. Other features</p>	1

S.No	CODE	NAME OF EQUIPMENT	DETAILS OF SPECIFICATION	Qty
			<ul style="list-style-type: none"> <li>i. Batteries Li-Ion rechargeable, no memory effect, during charging of batteries.</li> <li>ii. Capacity <math>\geq 4</math> hours of continuous measuring</li> <li>iii. Battery charger, adaptor and cables</li> <li>iv. Recharge time <math>\leq 2</math> hours</li> <li>v. Power supply 220 VAC <math>\pm 25\%</math>; 47 to 53Hz</li> <li>vi. Operating temperature 0 to 55 ° C</li> <li>vii. Humidity 0 to <math>\geq 90\%</math> RH</li> <li>12. Other features</li> </ul> <p>i. Tri axis Compensator (in addition to dual axis correction in the (X) and (Y) direction, mechanical error in the instrument is corrected).</p> <p>ii. Range under Normal Conditions:-</p> <ul style="list-style-type: none"> <li>• Single Prism: 5000 to 7000m or more</li> <li>• Distance Accuracy in Prism Mode: <ul style="list-style-type: none"> <li>a) Up to 10 meters: <math>+(3\text{mm}+2\text{ppm}\times D)\text{mm}</math></li> <li>b) From 10 meters: <math>+(2\text{mm}+2\text{ppm}\times D)\text{mm}</math></li> </ul> </li> <li>• Distance Accuracy in Reflectorless Mode: <ul style="list-style-type: none"> <li>c) Up to 300 meters: <math>+(5\text{mm}+2\text{ppm}\times D)\text{mm}</math></li> </ul> </li> </ul> <p>The total station shall comprise.</p> <p>The total station shall be of such a design that it functions reliably and accurately under the prevailing environmental and operational conditions.</p> <ul style="list-style-type: none"> <li>• The total station should be able to work efficiently within the temperature range 0° C to + 55° C <ul style="list-style-type: none"> <li>• Can measure Distance without Reflector 300 to 500 meter to a 90% reflective object (in good condition).</li> <li>• The total station shall be easy to operate and maintain.</li> <li>• The total station shall have all the latest technology of Absolute Encoders.</li> <li>• The total station shall be supplied with the accessories as needed for effective deployment. <ul style="list-style-type: none"> <li>• All materials of the total station exterior shall be non-corrosive.</li> <li>• All enclosures, cables and connectors shall be sturdy and water resistant.</li> </ul> </li> <li>• The total station shall be a rugged design that can cope with the prevailing shock and vibration as experienced in surveying operations and transport by jeep in rough terrain.</li> </ul> </li> </ul> <p>The total station shall be supplied with the accessories as needed for effective deployment.</p> <ul style="list-style-type: none"> <li>• All materials of the total station exterior shall be non-corrosive.</li> <li>• All enclosures, cables and connectors shall be sturdy and water resistant.</li> <li>• The total station shall be a rugged design that can cope with the prevailing shock and vibration as experienced in surveying operations and transport by jeep in rough terrain.</li> <li>• The total station shall have an expected technical lifetime of not less than 10 years.</li> <li>• Operator's and technical manuals, related to the type and model of the total station and the accessories shall be part of the delivery.</li> <li>• Power consumption shall be small, to be derived from batteries integrated and/or External batteries. <ul style="list-style-type: none"> <li>• The batteries shall be rechargeable and assembled in packages</li> </ul> </li> <li>• The connectors and electrical cables associated with the total station shall be reliable and sturdy. <ul style="list-style-type: none"> <li>• The total station shall have Visible Laser Pointer.</li> <li>• Date &amp; Time is recorded while modifying or creating a file.</li> </ul> </li> <li>• On Board pre-loaded graphical software Power Topo Lite or equivalent including Area Perimeter, Volume (Cut/fill) and Licensed copy of Auto Plotter Civil Software should invariably be part of the supply. In built road design function</li> </ul> <p>The total station shall comprise.</p> <ul style="list-style-type: none"> <li>a. Theodolite with integrated laser distance meter, tilt compensation, digital controller with keypad and display, supporting data storage.</li> <li>b. Data retrieval and communication unit .</li> <li>c. Tripod for the total station.</li> <li>d. Prism poles with associated tripods for prism assemblies. <ul style="list-style-type: none"> <li>• The laser output power shall be eye safe.</li> <li>• Operational training shall be part of the delivery.</li> </ul> </li> </ul>	

# INSTITUTE OF TECHNOLOGY, KORBA

## Schedule of Requirements

### Package No.- 10

Package Name :- Computer Science & Engg.

Sr. No.	Code	Name of Equipment / Software	Purpose	Details of Specification	Qty
1	CSE01	Computer Trainer Kit	All modules are connected separately & a clear demo can be given with this trainer kit.	Intel "845 or 945 or H61,G41", Chipset MotherBoard with p4 Processor supported A user can execute 342 P4 based nemonic. 40GB Hard disk, F.D.D., C.D.D. All the I/O is connected in daisy chain Manner.	0 2
2	CSE02	CD/DVD Trainer kit	A DVD writer 52xDVD writing speed. Connected in daisy channel manner. All modules are connected separately & a clear demo can be given with this trainer kit.	<b>R/W Head:-</b> 52x/48x/52x <b>Motor:-</b> Stepper motor 0.4 rotation angle. <b>Acceptor Tray:-</b> 0.1 Micron pit Fall reader. <b>A/D to D/A :-</b> Converter with Ladder Specification.	0 2
3	CSE03	Floppy Trainer Kit	A complete description of floppy disk can be given to student. All modulels are connected in daisy chain manner.	<b>Head:-</b> Dual Reader & Writer Head 1.44 M.B. Capacity. <b>Stepper Motor:-</b> 0.125 rotation angle. <b>A/D to D/A &amp; D/A to A/D:-</b> In Ladder R-R network.	0 2
4	CSE04	SMPS Trainer Kit	Purpose of this kit is a trainer can give a complete demonstration of working of a SMPS to student.	(i) SMPS for p4, Dual core & i5 processor. (ii) All modules of each SMPS will be connected in daisy chain manner. (iii) Clearly specified the hot ground module & cold ground module. (iv) Primary side & secondary side of SMPS is clearly specified.	0 2

# INSTITUTE OF TECHNOLOGY, KORBA

## Schedule of Requirements

### Package No.- 11

Package Name :- Analog Electronics

S. No.	Code	Name of Equipment	Details of Specifications	Quantity
1	EEE_AEC01	Function Generator with Frequency Counter	Function: Sine, Square, Triangle ,Ramp ,Pulse ,TTL & DC, Freq. Range : 1 Hz to 10 MHz, Sine; 0.3 Hz - 3 MHz (Square & Triangle), 0.2 to 2 MHz (Ramp, Pulse & TTL), in 7 steps Variable control between steps. Pulse duty cycle : 15% to 85 % min width 200 ns, Frequency Range and Mode Selection : Microcontroller based, Frequency Display : 20 X 4Alpha numeric LCD with backlit, Output Voltage : 20 Vpp open circuit, 20 & 40 dB (fixed) , 20 dB variable attenuation, Offset Range : $\pm 5$ V DC adjustable, External Frequency counter: up to 40 MHz, Modulation: FM, Mod. Frequency: DC-20 KHz, 2 Vpp max. Accessories: BNC to BNC with gold plated connectors.	2
2	EEE_AEC02	Transistor Amplifier (CB,CC,CE). Trainer kit	Include & inbuilt With power supply, Multimeters (Voltmeter & Ammeter ) , & Potentiometers, provide connecting Wires.	2
3	EEE_AEC03	RC coupled single & double stage CE transistor Amplifier trainer kit.	Include & inbuilt With power supply, Function Generator, Multimeters (Voltmeter & Ammeter ) , & Potentiometers, provide connecting Wires. Perform the frequency response of RC coupled amplifier with voltage/current feedback.	2
4	EEE_AEC04	Wein Bridge Oscillator trainer kit	Include & inbuilt With power supply, Function Generator, Multimeters (Voltmeter & Ammeter ) , & Potentiometers, provide connecting Wires.	2

S. No.	Code	Name of Equipment	Details of Specifications	Quantity
5	EEE_AEC05	Phase Shift Oscillator trainer kit	Include & inbuilt With power supply, Function Generator, Multimeters (Voltmeter & Ammeter ) , & Potentiometers, provide connecting Wires.	2
6	EEE_AEC06	Darlington pair amplifier Trainer kit	Include & inbuilt With power supply, Function Generator, Multimeters (Voltmeter & Ammeter ) , & Potentiometers, provide connecting Wires.	2

**INSTITUTE OF TECHNOLOGY, KORBA****Schedule of Requirements****Package No.- 12****Package Name :- Advanced communication**

<b>S. No</b>	<b>Code</b>	<b>Name of Equipment</b>	<b>Details of Specifications</b>	<b>Qty</b>
1	EEE_ACS01	Amplitude Mod./ De mod. Trainer	<ul style="list-style-type: none"><li>• am generator, dsb, dsb-sc, ssb, balanced modulator</li><li>• ac1-02 can also receive double-side band am broadcast signals in the am wave band</li><li>• exhaustive manuals are provided along with the kit that provides detailed experimental procedure</li><li>• it also completes circuit diagram explanation of the kit</li><li>• ring modulator, ceramic filter, tunable filter, low pass filter, switch faults</li><li>• on-board audio oscillator 100hz to 10khz</li><li>• amplitude modulation</li><li>• double sideband am generation</li><li>• single sideband am generation (usb/ lsb)</li><li>• output amplifier</li><li>• audio pre-amplifier</li><li>• ceramic filter</li><li>• on- board antenna</li></ul>	1
2	EEE_ACS02	Frequency Mod./ De mod. Trainer		1
3	EEE_ACS03	PAM ,PPM, PCM Mod./ De mod. Trainer		1
4	EEE_ACS04	PWM Mod./ De mod. Trainer		1
5	EEE_ACS05	ASK , FSK, PSK Mod./ De mod. Trainer		1
6	EEE_ACS06	TDM Mod./ De mod. Trainer		1
7	EEE_ACS07	Delta / Adaptive Mod./ De mod. Trainer		1
8	EEE_ACS08	Mod./ De mod. Trainer		1
9	EEE_ACS09	TDM Pulse Amplitude Mod./ De mod. Trainer		1
10	EEE_ACS10	TDM Pulse code Mod./ De mod. Trainer		1
11	EEE_ACS11	DSB/SSB AM Transmitter & Receiver trainer kit		1
12	EEE_ACS12	Sampling & Hold ckt Trainer		1

**INSTITUTE OF TECHNOLOGY, KORBA****Schedule of Requirements****Package No.- 13****Package Name :- Basic Electronics**

<b>S. No.</b>	<b>Code</b>	<b>Name of Equipment</b>	<b>Details of Specifications</b>	<b>Qty</b>
1	EEE_BE01	Characteristics of semiconductor diode trainer kit (Diodes, Zener, Germanium Diode, LED)	Include & inbuilt With power supply, Multimeters (Voltmeter & Ammeter ) , & Potentiometers, Diodes supply voltage in actual ranges form, provide connecting Wires.	2
2	EEE_BE02	Characteristics of Transistors (CB,CC,CE) Trainer Kit	Include & inbuilt With power supply, Multimeters (Voltmeter & Ammeter ) , & Potentiometers, provide connecting Wires.	2
3	EEE_BE03	Half wave , Full wave & Bridge Rectifiers Trainer Kit	Include & inbuilt With power supply, Multimeters (Voltmeter & Ammeter ) & Potentiometers, provide connecting Wires.	2
4	EEE_BE04	Characteristics of FET , MOSFET Trainer Kit	Include & inbuilt With power supply, Multimeters (Voltmeter & Ammeter ) , Potentiometers, provide connecting Wires.	2



**INSTITUTE OF TECHNOLOGY, KORBA**

**Schedule of Requirements**

**Package No.- 14**

**Package Name :- Microprocessor**

<b>S. No.</b>	<b>Code</b>	<b>Name of Equipment</b>	<b>Details of Specifications</b>
1	EEE_MP01	8085 Trainer Kit	with monitor programme, Hex keypad for programming, On Board 8255,8253,DAC and ROM and RAM, Battery backup for RAM , Facility of downloading and uploading the files from PC using USB.
2	EEE_2MP01	8051 Trainer Kit	Assembly language Programming USB Communication , Programming with Assembler, PC and Hex Keypad Programming Mode. On board 8255,8253,ADC and DAC. Ability of Programming with PC using USB.

# **INSTITUTE OF TECHNOLOGY, KORBA**

## **Schedule of Requirements**

### **Package No.- 15**

**Package Name :- Advanced Microprocessor**

<b>S. No.</b>	<b>Code</b>	<b>Name of Equipment</b>	<b>Details of Specifications</b>	<b>Quantity.</b>
1	EEE_AMP01	8086 Trainer kit	Programming Facility with MASM, TASM assembler, On board 8155, 8255, 8253, ADC and DAC . Ability of Programming with PC using USB	10

**INSTITUTE OF TECHNOLOGY, KORBA****Schedule of Requirements****Package No.- 16****Package Name :- Linear Integrated Circuits**

<b>S. No.</b>	<b>Code</b>	<b>Name of Equipment</b>	<b>Details of Specifications</b>	<b>Qty.</b>
1	EEE_LICA01	Bistable ,Astable & Monostable multivibrator trainer Kit	Include & inbuilt With power supply, Multimeters (Voltmeter & Ammeter ) , Function Generator & Potentiometers, design with transistor based. provide connecting Wires.	2
2	EEE_LICA02	Inverting, Non Inverting & Summing amplifier using OPAMP (741) trainer kit	Include & inbuilt With power supply, Multimeters (Voltmeter & Ammeter ) , Function Generator & Potentiometers, provide connecting Wires. Perform to Study the Frequency response its.	2
3	EEE_LICA03	Differential amplifier using OPAMP (741) trainer kit	Include & inbuilt With power supply, Multimeters (Voltmeter & Ammeter ) , Function Generator & Potentiometers, provide connecting Wires. To Study its CMRR, SVRR, and slew rate of an OPAMP(741).	2
4	EEE_LICA04	Astable & Monostable multivibrator using 555 timer trainer Kit	Include & inbuilt With power supply, Multimeters (Voltmeter & Ammeter ) , Function Generator & Potentiometers, provide connecting Wires.	2
5	EEE_LICA05	Comparator circuit trainer using OPAMP (741)	Should be a Universal Unit, designed to conduct experiments with both Analog as well as Digital Circuits. With Built in Solderless Breadboard of 1700 points. The Unit should have : DC Power Supply:5V, 1A. & $\pm 12V$ , 500mA.(Fixed) & 0 to 30V DC, 100mA Function Generator : Sine, Triangle & Square , TTL Waves up to 1 MHz. Clock Generator : 10 MHz TTL clock. 16 Nos. Data Switches - High/Low indication. 2 Nos. Pulser Switches & Logic Probe for Logic level indicator for TTL/CMOS. Fixed TTL Clocks 4 Nos. 1KHz, 100Hz, 5 Hz, 1 Hz. Onboard speaker - 8 Ohms, 0.5 Watt (1no.). Onboard POTS 1K & 1M. On Board Digital Panel Meter upto 200V.DC. 4 digit 7 segment display with BCD to 7 segment decoder. BNC to Banana Adapter. & RS 232 Interface Port . Should Operate in 230V +/- 10%, 50Hz/72VA.	2

S. No.	Code	Name of Equipment	Details of Specifications	Qty.
6	EEE_LICA06		<p>Following Add On Panel to be provided with the above Bread Board Trainer</p> <p>Advance Operational Amplifier Experiment panel</p> <p>Lowpass filter, High pass filter, Bandpass filter, Band stop(Notch)filter, Wien Bridge oscillator, Phase Shift oscillator, Sample &amp; hold circuit, Log amplifier, Antilog amplifier, Voltage to frequency converter, Frequency to voltage convertor, Square Rooter.</p> <p>Passive / Active / M Derived Filter Panel</p> <p>Passive (RC) filters- Low pass , High pass, Notch filter, Active filters- Low pass, High pass, Unity gain phase shifting, Butterworth, Bessel, Chebyshev filter</p> <p>LC (M derived / constant K type filters)- T type high pass Active filters, High pass m derived, Band stop, Band pass, M derived Band pass, Constant K type pass band, Band</p> <p>Elimination, Composite Low/High pass filter Can construct above filters &amp; plot their characteristics.</p> <p>Analog Multiplexer / Demultiplexer &amp; ADC, DAC Expt.Panel</p> <p>16 Channel Analog Multiplexer, 1 to 16 Analog Demultiplexer, A to D Converter (3 bit), D to A Converter (4 bit) weight &amp; binary &amp; R-2R</p>	

# **INSTITUTE OF TECHNOLOGY, KORBA**

## **Schedule of Requirements**

### **Package No.- 17**

**Package Name :- Digital Signal Processing**

<b>S. No.</b>	<b>Code</b>	<b>Name of Equipment</b>	<b>Details of Specifications</b>	<b>Quantity</b>
1	EEE_DSP01	DSP Processor Kit	Perform to generate Analog signals,discrete sequences,sample a sinusoidal signal at Nyquist rate,to convolve two given signals, to correlate two given signals, to design LPF using recursive structure	1

**INSTITUTE OF TECHNOLOGY, KORBA****Schedule of Requirements****Package No.- 18****Package Name :- Utilisation of Electrical Energy**

S. No.	Code	Name of Equipment	Details of Specifications	Quantity
1	EEE_UEE01	DC series motor	Input : 0 - 180 V Variable DC Machine Specifications Type : DC Series Voltage rating : 180 V Current rating : 3 A Power Rating : 1 HP RPM : 1500 R.P.M Meters used Voltmeter (MC) 1 No. : 300 V Ammeter (MC) 2 Nos. : 5 A Dimensions (mm) : W 350 × D 600 × H 450	1
2	EEE_UEE02	Three Phase Induction Motor Trainer – 1 HP	Mains Supply : Three Phase 415V ±10%, 50Hz Motor's Specifications Type : Squirrel Cage Rating : 1HP Voltage Rating : 415V RPM : 1440 (No Load) Insulation : Class 'B' Meters used Wattmeter : 1000W (2 Nos.) Voltmeter (MI) : 500V Ammeter (MI) : 5A MCB : 10A Tachometer : 20,000 RPM Dimensions (mm) : W 600 x D 350 x H 450 (Panel) W 250 x D 400 x H 600 (Motor) Weight (kg) Panel : 14.5 (approx.) Motor : 22 (approx.)	1

S. No.	Code	Name of Equipment	Details of Specifications	Quantity
3	EEE_UEE03	Three phase synchronous motor	<p>Mains Supply : Three Phase 415V <math>\pm</math>10%, 50Hz</p> <p>Machines Specification (2 Nos.) Both the Machines are flexibly coupled and mounted on a M.S Channel base.</p> <p>Three Phase Synchronous Motor Type: Salient Pole Motor Current type: AC Rating : 3 HP Excitation Voltage : 120 V Voltage rating : 415 V <math>\pm</math> 10%</p> <p>DC Machine Type : DC Shunt Rating : 2 HP Voltage Rating : 200 V RPM : 1500 (no load) Insulation : Class 'B'</p> <p>Meters Used Mains Supply : Three Phase 415V <math>\pm</math>10%, 50Hz Machines Specification (2 Nos.) Both the Machines are flexibly coupled and mounted on a M.S Channel base.</p> <p><del>Three Phase Synchronous Motor</del></p>	1

**INSTITUTE OF TECHNOLOGY, KORBA****Schedule of Requirements****Package No.- 19****Package Name :- Machine Lab**

<b>S. No.</b>	<b>Code</b>	<b>Name of Equipment</b>	<b>Details of Specifications</b>	<b>Quantity</b>
1	EEE_MC01	Synchronous Machine Training System	DC Power Supply Fixed : 180 - 200 V Variable : 0 - 180/200 V Machines Specification: Both the M-G Set are Flexibly Coupled and Mounted on a "C" channel Base DC Shunt Motor Specifications (acts as prime mover) Speed : 1500 rpm (no load) Insulation: Class "B" Synchronous Motor Specifications (acts as Generator) Rating: 3 HP Speed : 1500 rpm (no load) Insulation: Class "B"	1
2	EEE_MC02	DC Supply	Mains Supply : 230 V $\pm 10\%$ , 50Hz Outputs Variable DC : 0 -180V Fixed DC : 180V Transformer Rating : 2kVA Primary Voltage : 0-230V Secondary Voltage : 0-150V, 0-150V Meters Used Voltmeter (MI) : 300V Ammeter (MI) : 10A Auto Transformer : 270V, 10A MCB : 10A	3
3	EEE_MC03	Three Phase Induction Motor Trainer – 1 HP	Mains Supply : Three Phase 415V $\pm 10\%$ , 50Hz Motor's Specifications Type : Squirrel Cage Rating : 1HP Voltage Rating : 415V RPM : 1440 (No Load) Insulation : Class 'B' Meters used Wattmeter : 1000W (2 Nos.) Voltmeter (MI) : 500V Ammeter (MI) : 5A MCB : 10A Tachometer : 20,000 RPM Dimensions (mm) : W 600 x D 350 x H 450 (Panel) W 250 x D 400 x H 600 (Motor) Weight (kg) Motor : 22 (approx.) Panel : 14.5 (approx.)	1



S. No.	Code	Name of Equipment	Details of Specifications	Quantity
4	EEE_MC04	Slip Ring Induction Motor	Three Phase Mains Supply : 415V ±10%, 50Hz Induction Motor : 3 HP, 1440 RPM (No Load) Ammeter : 0-5 Amp Voltmeter : 0-500V Wattmeter (WA) : 2500W Wattmeter (WB) : 2500W Three Phases MCB : 10A Dimensions (mm) : W600 X H450 X D350	1
5	EEE_MC05	Three Point Starter	0.5 HP to 3 HP Motor	1
6	EEE_MC06	Four Point Starter	1 HP to 3 HP Motor	1
7	EEE_MC07	DOL starter	1 HP to 3 HP Motor	1
8	EEE_MC08	Scott Connection Trainer	Input : 415 V AC ±10%, 50 Hz Main Transformer Input Winding : 0 - 200 V (50%) ±10%, 50 Hz : 0 - 200 V (50%) ±10%, 50 Hz Output Winding : 0 - 230 V ±10%, 50 Hz Teaser Transformer Input Winding : 0 - 115.6 V (28.9%) ±10%, 50 Hz : 346.4 V (86.6%) ±10%, 50 Hz : 400 V ±10%, 50 Hz Output Winding : 0 - 230 V ±10%, 50 Hz Step down Transformers (2Nos.) Input Winding : 0 - 230 V ±10%, 50Hz Output Winding : 0 - 18 V ±10%, 50Hz Meters Used Voltmeter (MI): 500 V (2 Nos.) Ammeter (MI): 1 A (2 Nos.) Dimensions (mm) : W 600 x D 350 x H 450	1
9	EEE_MC09	Swinburn's Test Of DC Machine ( <b>1 HP</b> )	Input Supply : 200V Fixed DC: 0-200 Variable DC DC Machine Specification: Type : DC Shunt Rating : 1 HP Voltage Rating : 200V RPM : 1500 (no load) Meters used Voltmeter (MC type): 1 No. Ammeter (MC type): 1 No. Dimensions (mm) : W 350 x D 600 x H 450 (panel)	1
10	EEE_MC10	DC Machine	Input : 180V Fixed DC 0-180V Variable DC, DC Machines Type : DC Shunt Rating : ½ HP RPM : 1400 (No Load) Meters used Voltmeter (MI): 3 Nos. Ammeter (MI): 3 Nos. MCB : 5A	1

S. No.	Code	Name of Equipment	Details of Specifications	Quantity
11	EEE_MC11	Parallel Operation of Two Single Phase Transformers	Mains supply : 230 V AC $\pm 10\%$ , 50Hz Transformers (2Nos.) Rating: 1kVA Primary Voltage : 0 - 230 V Secondary Voltage : 0 - 200 - 230 V Meters Used Voltmeter (MI): 500 V (2 Nos.) Ammeter (MI): 10 A (2 Nos.) MCB (Single Phase) : 10 A	1
12	EEE_MC12	AC / DC Load	Mains Supply : AC / DC, 230V , $\pm 10\%$ Load Range : 0 - 1.2 kW, in steps of 100W Load Type : Resistive (Lamp Load)	1

# INSTITUTE OF TECHNOLOGY, KORBA

## Schedule of Requirements

### Package No.- 20

Package Name :- Power system protection

S. No.	Code	Name of Equipment	Details of Specifications	Quantity
1	EEE_PSP01	Over Current Relay Training System	Mains Supply : 230V $\pm$ 10%, 50Hz, Single Phase Variac, Input : 230V, Output: 0-270V, Current : 0 - 5A, Over Current Relay Type : Inverse Time, Normal Voltage : 110V AC, 50Hz, Current Setting : 0.5A, 0.75A, 1A, 1.25A, 1.50A, 1.75A and 2A, CT Secondary : 1A, Measurement, Voltmeter : 25 - 300V, Ammeter : 200mA - 5A, Timer : 10mSec - 30min	1
2	EEE_PSP02	Buchholz Relay Set Up	Relay size: GOR-1, Surge Test (Trip) cm/sec: 70-130, Gas Volume (Alarm) cc: 90-165, Relay Weight (Kg.): 5.5 (Approx)	1
3	EEE_PSP03	Earth Fault Relay Training System	Input Supply: 230 $\pm$ 10%VAC, 50 Hz Single Phase Variac Input: 230V Output: 0-270V Current: 0-5 Amps. Earth Fault Relay Type: Inverse Time Normal Voltage: 110V AC, 50Hz	1
4	EEE_PSP04	Differential Relay Training System	Mains Supply : 230 $\pm$ 10%, 50Hz, Single Phase Variac Input : 230V AC Output : 0 - 270V AC Single Phase transformer, Input : 230V AC Output : 24V AC Current : 3A Dimensions (mm) : W 830 x D 350 x H 645 Weight (kg) : 62 (approx.)	1

# INSTITUTE OF TECHNOLOGY, KORBA

## Schedule of Requirements

### Package No.- 21

Package Name :- Power system simulation

S. No.	Code	Name of Equipment	Details of Specifications	Quantity
1	EEE_PSS01	<b>ELECTRICAL POWER TRANSMISSION LINE SIMULATOR</b>	<p>a. Generating Station Module (Power Transformer):</p> <ul style="list-style-type: none"><li>• Input Voltage : 415V, 3Phase, 50Hz.</li><li>• Output Voltage : 110 - 220V Line Voltage</li><li>• Current rating : 2.5A</li></ul> <p>b. Artificial Transmission line module (400 KV)</p> <ul style="list-style-type: none"><li>• Type : Artificial Transmission line 3Phase Bench Model.</li><li>• No. of Pi Sections : 18nos.</li><li>• Operating Voltage : 110 - 220V, Line Voltage</li><li>• Current Rating : 2.5A</li><li>• Short Circuit Strength : 5A</li><li>• Line simulation through Iron cored inductor. Each pi- section for every 30Kms.</li></ul> <p>c. Fixed VAR Compensation Module</p> <p>This consists of shunt capacitors for voltage</p>	1

**INSTITUTE OF TECHNOLOGY, KORBA**  
**Schedule of Requirements**  
**Package No.- 22**

**Package Name :- Center Lathe**

S. No.	Code	Name of Equipment	Details of Specifications	Qty
1	WS_CL_01	Center Lathe - 'A'	HMT or Equivalent Make, All geared drive Height of centre 250 mm/ 10", Distance between centre - 750 mm/ 30", Bed Length - 1800mm/6" Swing over Bed - 600 mm/24", Swing in gap - 725mm/29", Swing over cross slide-350mm/14", width of bed-350mm/14", hole through spindle - 80 mm, no. spindle speeds - 16, 35-2000, Whitworth thread - 32, 4-60, Metric Thread - 32, 0.5-60, Cross Slide travel - 400 mm/ 16", Top Slide travel - 175mm/7", Power - 2HP, Collet Attachment with one collet, one spanner set, One Allen Key Set, Oil Can Etc. Accessories - Knee tool holder, Boring tool holder, Centering & facing plung type, Drill chuck with sleeve, Multi Tool holder, Parallel Shank Drill sleeve MT-1/MT-2	2
2	WS_CL_02	Center Lathe - 'B'	HMT or Equivalent Make, Cone pulley Drive Height of centre 250 mm/ 10", Distance between centre - 750 mm/ 30", Bed Length - 1500mm/5" Swing over Bed - 600 mm/24", Swing in gap - 725mm/29", Swing over cross slide-350mm/14", width of bed-350mm/14", hole through spindle - 80 mm, no. spindle speeds - 16, 35-2000, Whitworth thread - 32, 4-60, Metric Thread - 32, 0.5-60, Cross Slide travel - 400 mm/ 16", Top Slide travel - 175mm/7", Power - 1.5 HP, Collet Attachment with one collet, one spanner set, One Allen Key Set, Oil Can Etc. Accessories - Knee tool holder, Boring tool holder, Centering & facing plung type, Drill chuck with sleeve, Multi Tool holder, Parallel Shank Drill sleeve MT-1/MT-2	3

# INSTITUTE OF TECHNOLOGY, KORBA

## Schedule of Requirements

### Package No.- 23

Package Name :- Universal Milling Machine

S. No.	Code	Name of Equipment	Details of Specifications	Qty
1	WS_UM_01	Universal Milling Machine	<p>HMT or Equivalent Make, Working Surface - 1050 X 250 mm, No. &amp; Size of T-Slots - 3 X 30 mm, Distance between T- Slots - 55 mm, Cross Feeds - 200mm, Vertical feeds - 357 mm, longitudinal - 525 mm,. Arbor - 25.4mm, No.pof Speeds - 6 (50-750), Taper - ISO-40, Distance from spindle to Top (Min.-Max.) - 10 -350 mm, Spindle - 2 HP, 1440 RPM, Coolent - 0.10 HP, 1800 RPM, Cross - 125 - 350 mm, Vertical - 150 - 435, Speeds for vertical head (Ram type) - 6 (160 - 425 mm)</p> <p>Accessories - Protection Kit, Deviding Head, Rotary Table, Slotting Attachment, Vertical Attachment (Universal Type), Rack Cutting Attachment, Vertical milling attachment, 3 jaw true chuck with flange fitted, Milling m,achine vice size - 125 mm with swivel base.</p> <p>Additional Tools - 1. Involute gear cutter, 2. End Mill cutter size - 3/8"</p>	1

# INSTITUTE OF TECHNOLOGY, KORBA

## Schedule of Requirements

### Package No.- 24

Package Name :- Shaper Machine

S. No.	Code	Name of Equipment	Details of Specifications	Qty
1	WS_SP_01	Shaper Machine	HMT or Equivalent Make, Shaping machine V-Belt Cone pulley drive, RAM fitted with quick action rocker arm mechanism, square box table swivel type. Complete with 1.5 hp Motor (3-Phase) Belts, push button starter, machine vice with handle, manual hand lubricator with pipe line connections capacity - maximum stroke - 18", Tool holder with tool. Accessories - Key cutting attachment, Hydraulic trace attachment, automatic tool lifting, tool slide auto feed, auto up-down for work table.	1
2	WS_SP_02	Shaper Machine	HMT or Equivalent Make, Shaping machine all geared drive, RAM fitted with quick action rocker arm mechanism, square box table swivel type. Complete with 1.5 hp Motor (3-Phase) Belts, push button starter, machine vice with handle, manual hand lubricator with pipe line connections capacity - maximum stroke -18", Tool holder with tool. Accessories - Key cutting attachment, Hydraulic trace attachment, automatic tool lifting, tool slide auto feed, auto up-down for work table.	1

# **INSTITUTE OF TECHNOLOGY, KORBA**

## **Schedule of Requirements**

### **Package No.- 25**

**Package Name :- Wooden Lathe**

<b>S. No.</b>	<b>Code</b>	<b>Name of Equipment</b>	<b>Details of Specifications</b>	<b>Qty</b>
1	WS_WL_01	Wooden Lathe	Length of Bed 4½', Height of Centre 6½", Width of Bed-7", Admit between Centre-30", Spindle Bore-3/8", Spindle Taper-MT2, Spindle Thread (In./TPI)- 1"/8, No. of Spindle Speed-3, Face Chuck Dia -8", R.P.M.- 3000/1500/750, Power – 1 HP, manufactured by highly reputed company ISO Certified conforming to IS/ BIS Specifications.	1



# INSTITUTE OF TECHNOLOGY, KORBA

## Schedule of Requirements

### Package No.- 26

Package Name :- Welding shop

S. No.	Code	Name of Equipme	Details of Specifications	Qty
1	WS_WLD_01	<b>MIG Welding Machine</b>	<p>Make: ESAB/FRONIUS/LINCOLN ELECTRIC suitable for outdoor duty application</p> <ol style="list-style-type: none"> <li>1. Supply voltage: 415 Volts <math>\pm 10\%</math> AC, 3 Phase, 50 Hz</li> <li>2. Rating at 60% duty cycle: 20 kVA</li> <li>3. Primary Current at the Rated Output at 415 V supply: 30 Amps</li> <li>4. Open circuit voltage: 55 Volts DC</li> <li>5. Maximum continuous hand welding current at 60% duty cycle: 400 Amps. DC</li> <li>6. Type of welding voltage current regulator: Step-less</li> <li>7. Insulation: 'H'</li> <li>8. Cooling: Forced Air Cooled</li> <li>9. Wire feeder Unit: Servo wire feeder with servo drive control motor. Feed Mechanism of Double roll quick change-over type.</li> </ol> <p>Wire size:</p> <p>Mild Steel : <math>\varnothing 0.8</math> to 1.2 mm</p> <p>Stainless Steel : <math>\varnothing 0.8</math> to 1.2 mm</p> <p>Aluminium : <math>\varnothing 0.8</math> to 1.2 mm</p> <ol style="list-style-type: none"> <li>10. Welding Torch: MIG water cooled Torch fitted with 3.0 m flexible &amp; light to handle cable hose and connector. Provision for Torch neck swiveling and locking to suit positional welding &amp; welding in difficult areas.</li> <li>11. Pressure regulator &amp; flow meter – 1 set</li> <li>12. Co2 heater with core assembly – 1 set</li> <li>13. Cables and Hoses: Interconnecting cable/hose assembly (15.0 m long) between Power Source and Wire Feeder Unit. All Cables will be made of Copper</li> <li>14. Accessories: <ol style="list-style-type: none"> <li>a. Any other accessories as recommended by vendor for better efficiency and maximum utilization.</li> <li>b. Tool Kit consisting of Nozzle Cleaner, Alley keys, Plier for cutting wire etc.</li> </ol> </li> <li>15. Approximate Weight: less than 120 kg</li> <li>16. Approx. Dimensions (L x W x H): 650x450x600 mm</li> </ol>	1
2	WS_WLD_02	<b>Spot Welding Machine</b>	<p>Primary Voltage : To be suitable for 415V, 3 phase, 3 wire, 50 Hz, AC Supply.</p> <p>Rating @ 50% duty cycle : 200 KVA</p> <p>Secondary No load voltage ( in stages) : 6- 12 V</p> <p>Max. Welding current : 68 KA</p> <p>Secondary short circuit current : 85 KA (VDE 0545)</p> <p>Max. Welding load : 680 KVA</p> <p>Connected load : 520 KVA</p> <p>Electrode pressure : 300 to 2500 KPa.</p> <p>Electrode working range : 250 mm</p> <p>Arm spacing : 65/445 mm</p> <p>Clamping plates: (Above) : 400 x 400 mm</p> <p>: ( Below) : 400 x 400 mm</p> <p>Ventilation spacer : Rectangular cross section (2x10). Sq.mm</p> <p>Max. dia. of stamping : 1300 mm</p> <p>In case of segment dia. up to : 3000 mm</p> <p>Thickness of Ventilation stamping: up to 1.0 mm.</p> <p>Operating speed. : 60 to 90 Spots/min</p> <p>Weldable Spots : 1 to 7 spots in a single stroke.</p> <p>Cooling : Water cooling</p> <p>Primary Current : 280 A</p> <p>Max Primary Current : 1180 A</p> <p>Throat Depth : 480 mm</p> <p>Machine should be able to work with air pressure of 70 PSI and supplier should provide moisture drying system.</p>	1

S. No.	Code	Name of Equipme	Details of Specifications	Qty
3	WS_WLD_03	<b>AC Arc Welding Machine</b>	<p>Make: ESAB/FRONIUS/LINCOLN ELECTRIC suitable for outdoor duty application</p> <p>3 Phase AC Arc welding machine</p> <ol style="list-style-type: none"> <li>1. Supply voltage: 415 Volts <math>\pm 10\%</math> AC, 3 Phase, 50 Hz</li> <li>2. Rating at 60% duty cycle: 10 kVA</li> <li>3. Primary Current at the Rated Output at 415 V supply: 30 Amps</li> <li>4. Open circuit voltage: 55 Volts DC</li> <li>5. Maximum continuous hand welding current at 60% duty cycle: 400 Amps. DC</li> <li>6. Type of welding voltage current regulator: Step-less</li> <li>7. Insulation: 'H'</li> <li>8. Cooling: Forced Air Cooled</li> </ol>	1

# INSTITUTE OF TECHNOLOGY, KORBA

## Schedule of Requirements

### Package No.- 27

Package Name :- Robotics Lab

S. No.	Code	Name of Equipment	Details of Specifications	Qty
1	ME_RB_01	<b>5 Axis Robotic Arm System</b>	5- Axis Robotic System 5 - Servo Motors: Futaba/Hitech motor with a torque of 16Kgcm at 6 Volts. Acrylic Design with Hand Crafted Base Atmega 16/32 Based Circuit board with 6 PWM Motor Output and Computer Control Circuit. Technical Specifications • Degree of Freedom: 5 • Payload Capacity (Fully Extended): 500 g • Maximum Reach (Fully Extended): 400 - 500mm • Envelope: Hemispherical • Rated Motors Speed (Adjustable): 0-0.3 m/s • Joint speed (Adjustable): 0-60 rpm • Hardware interface: USB/Serial • Shoulder Base Spin: 180° • Shoulder Pitch: 180° • Elbow Pitch: 180° • Wrist Roll Spin: 180° • Wrist Pitch: 180° • Gripper Opening (Max): 50mm	1
2	ME_RB_02	<b>Hex Crawler Robot, Machatronics Robot</b>	Hex Crawler Robot (HEXCR Ver 1) : ATmega 16/32 Based Circuit Board with 14 PWM Motor Controlling Output and 3 Analog /Digital Input Board. Complete Hand Crafted Acrylic Base Design and some parts with Aluminium Parts. 12- Servo Motors: Futaba/Hitech motors with 16 kgcm at 6 Volts. LiPo/LiMh 11.6/12 V 3000 mAh Rechargeable Battery Pack Technical Specification • Mobility: Six Leg • Degree of Freedom: 12 • Payload Capacity: 2 KG • Mode: Autonomous and Wireless Control System • Rated Motors Speed: 0-0.3 m/s • Leg Spin: 180° • Base Limb Spin: 180°	1
3	ME_RB_03	<b>Ultra Sonic Range Finder</b>	Ultra Sonic Range Finder: ATmega 16/32 Based Circuit Board with 4 DC Motor Drives and 2 PWM Motor Controlling and 3 Analog/ Digital Input. Wireless Control Drives. Acrylic hand Cra2ed Base 8 AA Size Rechargeable / Normal Cell Board. Technical Specifications • Mobility: Four Wheel Differential Drive • Degree of Freedom: 2 on wheels • Mode: Autonomous and Wireless Control System • Motor Speed: 150 – 200 RPM • Sensor: Range Finding Sonar Sensor with range of (0 - 4000 mm)	1

S. No.	Code	Name of Equipment	Details of Specifications	Qty
4	ME_RB_04	<b>Pick and Place Robot</b>	Pick and Place Robot: ATmega 16/32 Based Circuit Board with output 4 Dc Motor drives and 4 PWM Motor Controlling. Wireless Control Drives. Acrylic Hand crafted Base. 7 Ah Lead Acid Battery with charging unit Technical Specifications <ul style="list-style-type: none"> <li>• Mobility: Four Wheel Differential Drive</li> <li>• Articulated Arm:</li> <li>• Degree of Freedom: 4</li> <li>• Payload Capacity (Fully Extended): 300 g</li> <li>• Maximum Reach (Fully Extended): 300 - 400mm</li> <li>• Wireless Control for Arm Motor</li> <li>• Complete 360 Rotational Arm Base</li> <li>• Gripper Opening (Max): 50mm</li> </ul>	1
5	ME_RB_05	<b>Wooden Model to study of robotic arm configuration</b>	Various Arm Configurations (Wooden Models) Cartesian coordinate Configuraton. Cylindrical Configuraton. Polar Configuraton. Joint Arm Configuration.	1

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## Schedule of Requirements

### Package No.- 28

Package Name :- CNC Lab

S. No.	Code	Name of Equipment	Details of Specifications	Qty
1	ME_CNC_01	<b>CNC Lathe Machine</b>	<p>Complete package for machine CNC-Ready including two stepper motor mounts on the lathe.</p> <p>Swing over bed 3.50" (90 mm) Swing over carriage 1.75" (45 mm) Distance between centers</p> <p>8.00" (200 mm) Hole through spindle .405" (10 mm) Spindle nose thread 3/4"-16 T.P.I. Spindle nose taper #1 Morse Travel of crossslide 4.25" (110 mm)</p> <p>Tailstock spindle taper #0 Morse Protractor graduations 0° to 45° by 5° Handwheel graduations .001" (.01 mm) Length overall 24" (610 mm) Width overall 7.5" (190 mm) Height overall 6" (150 mm) Shipping weight 24 lb. (10.9 kg) Motor 90 volt DC with electronic speed control that accepts any incoming current from 100VAC to 240 VAC, 50 Hz or 60 Hz. Click here for motor specifications. Spindle speed range 70-2800 RPM continuously variable by electronic speed control Computer with all necessary accessories system Preloaded with software and operating system.</p>	1
2	ME_CNC_02	<b>CNC Mill Machine</b>	<p>Complete Package for machine CNC-Ready including three stepper motor mounts on the mill. Mill includes X/Y leadscrew oiler.</p> <p>Max clearance, table to spindle 9.00" (229 mm) Throat (without headstock spacer block) - Adjustable</p> <p>Travel, "X" Axis - 8.68" (229 mm) (9" w/ stop screw removed) Travel, "Y" Axis - 7.00" (178 mm)</p> <p>Travel, "Z" Axis 5.38" (137 mm) Hole through spindle -.405 (10 mm) Spindle nose thread 3/4-16 T.P.I.</p> <p>Spindle taper - #1 Morse Handwheel graduations- .001" (.01 mm) Width overall 15.00 (381 mm)</p> <p>Depth overall 22.25" (565 mm) Height overall 23.38" (568 mm) Table size 2.75" x 13.00" (70 x 330 mm) Shipping weight 38 lb. (17.2 kg)</p> <p>Movements in addition to X-, Y- and Z-axes</p> <p>Headstock rotation 90° left/right, column rotation (90° L/R), column pivot (front/back), column swing (90° L/R) and 5.5" column travel (in/out) Headstock rotation 90° left/right</p> <p>Motor/Speed Control 90 Volts DC with electronic speed control (Accepts 100 VAC to 240 VAC, 50 - 60 Hz input and converts automatically to 90 VDC)</p> <p>Spindle speed range 70 to 2800 RPM continuously variable with electronic speed control</p> <p>Computer with all necessary accessories system Preloaded with software and operating system.</p>	1

# INSTITUTE OF TECHNOLOGY, KORBA

## Schedule of Requirements

### Package No.- 29

#### Package Name :- Physics Lab

S.No	Code	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY
1	PHY_01	Demorgans Kit	1. Power supply requirement:230V AC, 50 Hz. 2.Built in IC based regulated Power supply:0-5V DC/200mA. 3. Following parts provided on single PCB with connecting terminals . NOT Gates:IC 7404-1 No. AND Gates :IC 7411-1 No. OR Gates:IC 4075 -1 No. 4. High /Low switches: 3. Nos provided to apply 0 and 1 level. 5. Logic output indicators: 4 LEDs provided for output level indication.	2
2	PHY_02	P-N diode, DC regulated power supply, Voltmeter, Milliammeter, 1 KW resistor, Beaker, Thermometer, Heater.	1. Power supply requirement:230V AC, 50 Hz. 2.Built in IC based regulated Power supply:0-5V DC/200mA. 3. Following parts provided on single PCB with connecting terminals . NOT Gates:IC 7404-1 No. AND Gates :IC 7411-1 No. OR Gates:IC 4075 -1 No. 4. High /Low switches: 3. Nos provided to apply 0 and 1 level. 5. Logic output indicators: 4 LEDs provided for output level indication.	2
3	PHY_03	1. Optical bench, 2. Fresnel's Biprism 3. Bi-prism holder 4.Double Convex lense 5.Lense Holder 6.Micrometer eye piece 7.Optical slit 8.Reading Lense 9.Sodium Light Source	1. Optical bench: Two 150 cm long steel rods 3/4 dia. forming a bench with end supports having leveling screws. One of the steel rods is graduate in cm and mm. It has five riders, two with transvers motion. 2. Fresnel's Biprism : Optical worked made from Crown Glass, 50X40 mm size. 3. Bi-prism holder : It has fine radial motion operated by fine pitch screw. 4.Double Convex lense : 50mm diameter &F.L 10 cm. 5.Lense Holder: Spring action type having well ground stainless still jaws 6.Micrometer eye piece: A ramsden 10X eye piece carried on a slide which moves along a micrometer screw. The movement is read on a 30-0-30 mm steel scale and directly on micrometer head to .001cm No backlash. 7.Optical slit: Optically true, prcision ground stainless steel jaws. 8.Reading Lense: 40/50 mm diameter with handle 9.Sodium Light Source: Sodium light source complete with sodium lamp 35 watt with vacume jacket. Transformer & wooden box having 4holds with slide covers one each on every side at different height. 10. Incandescent lamp:with hous on stand: For white light	2
4	PHY_04	1.Diode Laser with power supply, 2.Circular Table 3. Laser Detector 4.Diffraction Grating 5. Nanoammeter 6. Reading lense 7.Sprite level	<b>1.Spectrometer standard:</b> 6" dia circle reading 30seconds, with a long arm in place of Telescope fitted with double convex lens 50mm dia, focal length 40cm on one end and photo voltaic cell with width adjustable slit on the other end. The distance between lens and photo voltaic cell can be adjusted for better focussing. Prism table is provided with three leveling screws and is engraved with concentric rings and lines. The scales and verniers are of stainless steel and are machine divided.  2. Digital Nanoammeter:Range : 100nA, 1mA, 10mA, 100mA.  Accuracy : $\pm 0.25\%$ for all ranges  Resolution : 0.1nA, 1.0nA, 10nA, 100nA.  Input Resistance : 25W, 2.5W, 0.25W, 0.025W.  Display : 3½ digit 7segment LED (12.5mm height) with auto polarity and decimal indication.  3. Prism : Optically work with two faces polished , size 38mm*38mm  4. Power supply:0-6V Dc at 3A, IC regluted short circuit protected power supply & fine voltage circuit protected power supply & fine voltage control with two digital pannel meter of 31/2 digit one of 19.99 V DC & other of 19.99Amp DC .  5. Photo voltic cell: with width adjustable slit	2
5	PHY_05	e/m Thomson Kit	Complete Setup	2
6	PHY_06	Hall Effect Apparatus	Complete Setup	2

S.No	Code	NAME OF EQUIPMENT	SPECIFICATION	QUANTITY
7	PHY_07	Stop Clock, Vernier Calipers, Thred, Iron Fly Wheel, Weight 500kg. (3 piece)	Comprising of carefully machined and balanced cast iron wheel and steel spindle is supported on the ball bearings in strong iron brackets . The sides of wheel are smoothly red painted. The top of wheel is chrome plated and is marked with a thick red line. A pointer is fixed to one of the brackets. Diametric hole is drilled in the shaft to take a pin and cord the base is provided with four holes so that the apparatus can be fixed to wall complete with cord and hook. 15cm wheel dia. 20cm wheel dia	1
8	PHY_08	1. Sonometer 2.Tuning fork 3.Rubber pad for tuning fork Step down transformer Electromagnet Horse shoe magnet,Screw gauge,Retord stand with Clamp,Slotted weights: 1/2 Kg set of 5 including hanger i.e. 2½ kg total. Connecting wires	One metre long, made of soft wood and well polished. Fitted with two metre scale graduated in centimeters. It is provided with wire of two different material steel and brass, sliding knife edges and hook etc. Set of eight, small size, made of steel, nickle plated. Frequency is marked on the tuning forks. The frequencies are 256, 288, 320, 341, 384, 420, 480 and 512Hz.	2
9	PHY_09	1. Jager's apparatus 2. Cappillary Tube 3. Beaker (250ml) 4. glass(250ml) 5. Plastic 500ml 6.Traveling Microscope 7 Rubber Tube 8.. One rod	Jaeger's surface tension having a mouth reagent bottle fitted with a cork having two holes, in one hole a dropping funnles is fitted. Complete with manometer, capillary tube. All mounted on suitable wooden stand.Without aspirator.	2
10	PHY_10	Five steel balls of different sizes , Glass cylinder with glycerine , Two strong magnet ,Stop watch, Micromer scale Thermometer gravity hydrometer	Complete set up	2

# INSTITUTE OF TECHNOLOGY, KORBA

## Schedule of Requirements

### Package No.- 30

#### Package Name :-Chemistry Lab

S.N.	Code	Apparatus Name	Specification	Qty
1	CHY_01	Desicator	8" neutral glass stoppered with cap	5Pc
2	CHY_02	Hot Plate round 8"	Round 8" dia, with energy Regulator & thermostatic control	2Pc
3	CHY_03	Lab Oven upto 250C	Upto 250C, 14'X14'X14' electric operated, double walled inside stainless steel, outside mild steel painted in epoxy powder coating. Two indicators and on/off switch. To work on 220/230 volts A.C. With one number air circulating fan & digital temperature controller cum indicator.	1Pc
4	CHY_04	Electronic Balance	Capacity 120 gm Readability .1mg or .0001gm,	1Pc
5	CHY_05	Centrifuge Machine	6tube, Electric operated, with 5 step speed regulator, 4000 rpm, heavy gauge spun aluminium guard bowl stoved enamel paint.	5Pc
6	CHY_06	PH meter	Microprocessor Based, range 0 to 14 ph, display 16x2 digit LCD Display, accuracy 0.01 ph +-1 digit, resolution 0.01 ph, temp compensation auto 0 to 100 degree C auto buffer reco...4.00, 7.00, 9.20 ph, power 230V +10% AC. Size 285x 190x90 mm, storage upto 90 samples, ph electrode, buffer sol & manual, 8 soft touch membrane type touch.	1Pc
7	CHY_07	Bomb Calorimeter	As per IP 12 ASIMD, 4809, IS 1448 Complete with digital thermameter, Complete with oxygen cylinder	1Pc
8	CHY_08	Abels point Apparatus	As per IP 170, with refrigeration system 10 to 70 degree C.	1Pc
9	CHY_09	Pensky's Martyn's apparatus	E- regular FHP stirrer with stand, IPO 004 B,	1Pc
10	CHY_10	Water bath	rectangular, 6 holes, ISO Certified, electric operated. Double walled, top has 75 mm holes with concentric rings. Temp. upto 99 degree C. thermostatically controlled fitted with neon lamp, indicator, main switch and workable on 220V AC. SIZE 325X250X100 mm.	2Pc
11	CHY_11	Deep freezer (vertical)	150 ltr, wheel on rear side, CFC Free heavy duty compressor, plastic body, solid door works on 220V AC/ temp. range -20 c, puff insulated to prevent thermal losses. Specially designed combination of pull out drawer system for storage.	1Pc
12	CHY_12	Dissolved oxygen meter	Microprocessor Based, display 16x2 line LCD, RANGE 0-20 ppm, accuracy 0.2ppm, resolution 0.1ppm, calibration automatic, storage upto 90 samples, with soft touch key.	1pc
13	CHY_13	Water and soil analysis kit	7 parameters ( ph,conductivity, temperature, TDS, DO, Turbidity, salinity,) Microprocessor Based, 3.5 digit LCD, Power supply 230V +10% AC OR 12V rechargeable battery. With accessories ph electrode, conductivity/TDS/salinity cell, temp probe, Do probe and dry cell container (161) main operational manual, bottles for ph sollution & tablets bottles (161) turbidity test set (191).	1Pc



**INSTITUTE OF TECHNOLOGY, KORBA**  
**Schedule of Requirements**  
**Package No.- 31**  
**Package Name :-Hostel Furniture**

Sr. No	Code	Item Description	Technical Specification	Qty
1		2	3	4
1.	HF_01	Bed(cot) Type 'A'	<b>Size:</b> 1830mm X 914mm X 762mm Material Deatails: Top with 18mm ply of ISI/BIS mark. Suitable pipe structure of size 25mm dia X 1 mm thick for mounting bed top. Bed top is made of 20 Guage CRC-A sheet. Painted with two coats of enamel paint Colour: Black	50
2.	HF_02	Bed(cot) Type 'B'	<b>Size:</b> 1905mm X 914mm X 762mm Material Deatails: Top with 18mm ply of ISI/BIS mark. Suitable pipe structure of size 25mm dia X 1 mm thick for mounting bed top. Bed top is made of 20 Guage CRC-A sheet. Painted with two coats of enamel paint Colour: Black	240
3.	HF_03	Single Desk Chair Set	<b>Desk Size:</b> W 675mm X D 450mm X H 750mm Material Details: 25mm X 1.0mm Sq. MS pipe structure. Table top size – 675mm X 450mm X 18 mm BIS/ISI mark pre-laminated particle board w polished teak wood lipping. Fabrication Details: Top Size: 675mm X 450mm. Frame should be welded with good quality all round welding. Or shelf of suitable size CR sheet (22 gauge) for student's bags should be fix at 175mm below the table top. Suitable additional support should be provi in structure/frame at the legs. Paints: Painted with two coats of Enamel. Frame color should be Light Grey. <b>Chair Size:</b> W 375mm X D 375mm X H 450mm X BH (Back Height) 850 mm. Back rest Size – 125mm X 375mm. Material Details: 25mm X 1.0mm MS Sq. pipe structure. Seat & back rest made of 18 mm BIS/ISI mark PLPB with polished teak wood lipping. Fabrication Details: Seat Size: 375mm X 350mm Back Rest Size: 125mm X 375mm. Seat height should be 450mm and back rest should be fitted at 275 mm above seat. Suitable additional support should be provided in structure/frame at the legs. Frame should be welded with good quality all round welding. Paints: Painted with two coats of Enamel. Frame color should be Light Grey.	360
4.	HF_04	Double Computer Table	Size: W 1800mm X D 450mm X H 750mm Material Details: Made of Hi-Density Pre-laminated 18mm BIS/ISI mark Board. With PVC Edge binding. Top should be 18mm Post-forming. Inner Details: Two separate fixed (Non-sliding) PLPB board of size 850mm X 375mm should be provided for Keyboard mounted at 375mm from table top and should be projected 150 mm outside from side walls. There should be two back covers of size 1725mm X 200mm and 1725mm X 150 mm from 75 mm below the top and 75 mm above the bottom respectively.	12
5.	HF_05	Computer Chair	Size: W 450mm X 450mm X H 860mm Fitted with bentwood shell. Material Details: Pipe Structure of 19mm dia. chrome plated. Shell should be bentwood single ply shell. Surface of shell should be clear varnish finish, fitted with Rubber Shoes. Space between from legs 420 mm and space between side legs 450mm.	24

Sr. No	Code	Item Description	Technical Specification	Qty
6.	HF_06	News Paper Stand	Size: W 800mm X D 600mm X H 1250mm Material Details: Structure should be made of 25mm X 1mm MS sq. pipe & Base pipe should be 50mm X 25mm X 1mm MS pipe with Top made by 18mm Pre-laminated Board. Edges should be covered with PVC edge binding. Two nos. grips should be fitted at top for holding newspaper. Top board Size: 600mm X 825mm PLPB.	12
7.	HF_07	Reading Table	Size: W 1800mm X D 900mm X H 750mm Material Details: Top made of Hi-Density Pre-laminated 18mm BIS/ISI mark PLPB board with PVC Edge binding mounted on two side walls of PLPB of size 600mm X 575mm. Top should be 25mm Post-forming. A partition of size 1050mm X 525mm will be fitted between side walls.	20
8.	HF_08	Visitors Chair (perforated three seated steel chair)	Size: W 1800 mm X D 750mm X H 750mm Material Details: Perforated steel shell of 18 guage(1.25mm thick) fitted with chrome legs and floor adjuster. Paints: Black powder coated structure should be chrome finished.	30
9.	HF_09	Office Almira	Size: H 1950mm X W 900mm X D 475mm. Material Details: Sheet should be 22 Gauge CR Sheet Fabrication Details: Four shelves each equal divided at inner side of Almira. Door with locking system. Paints: Painted with two coats of Enamel Paint. Color: Grey.	06
10.	HF_10	Reading Chair	<b>Chair Size:</b> W 375mm X D 375mm X H 450mm X BH (Back Height) 850 mm. Back rest Size – 125mm X 375mm. Material Details: 25mm X 1.0mm MS Sq. pipe structure. Seat & back rest made of 18 mm BIS/ISI mark PLPB with polished teak wood lipping. Fabrication Details: Seat Size: 375mm X 350mm Back Rest Size: 125mm X 375mm. Seat height should be 450mm and back rest should be fitted at 275 mm above seat. Suitable additional support should be provided in structure/frame at the legs. Frame should be welded with good quality all round welding. Paints: Painted with two coats of Enamel. Frame color should be Light Grey.	120
11.	HF_11	Office Chair	Size: W 600mm X D 600mm X H 1150mm Material Details: High Back Revolving Chair fitted with cushioned Handle, Hi- Density PU Foam, Tilting with adjustable Gas Lift, and 5 legged fiber base with heavy duty nylon wheels. Color: Seat and back foam covered with leatherite fabric.	02
12.	HF_12	Office Table	Table Size: W 1200X D 750mm X H 750mm Material Details: Table Top should be 25mm BIS/ISI mark Post-forming PLPB. Right side a box with three drawers made of 22 gauge CR sheet each with separate locking system. Top frame should be made of 25mm X 25mm X 3mm angle iron. Suitable pipe structure of size 25mm dia X 1mm thick for mounting table top. Paints: Painted with two coats of Enamel Paint. Color: Grey	06
13.	HF_13	Notice Board	Size: W 1230mm X D 760mm X H 10 mm Material Details: Aluminium frame of 16 Guage, Right side single opening with lock system, Front door with transparent fibre, Velvet covered base.	06

Sr. No	Code	Item Description	Technical Specification in published tender	Qty
14	HF_14	Dining Table	Size: W 2438 mm X D 1200 mm X H 750mm(8X4X2.5 ft) Material Details: Top should be good quality BIS/ISI mark 25mm plywood covered with Mica and teak wood Lipping. With 300 mm height flap fitted at back side of Table for electric board purpose and without flap. Structure should be made by 32mm X 32mm X 5mm Angle with additional support of 25mm X 25mm X 5mm angle between legs. Fabrication Details: Structure should be good quality all round welded. Paints: Painted with two coats of Enamel Paint color: Grey.	30
15	HF_15	Dining Chair	<b>Chair Size:</b> W 375mm X D 375mm X H 450mm X BH (Back Height) 850 mm. Back rest Size – 125mm X 375mm. Material Details: 25mm X 1.0mm MS Sq. pipe structure. Seat & back rest made of 18 mm BIS/ISI mark PLPB with polished teak wood lipping. Fabrication Details: Seat Size: 375mm X 350mm Back Rest Size: 125mm X 375mm. Seat height should be 450mm and back rest should be fitted at 275 mm above seat. Suitable additional support should be provided in structure/frame at the legs. Frame should be welded with good quality all round welding. Paints: Painted with two coats of Enamel. Frame color should be Light Grey.	160

# INSTITUTE OF TECHNOLOGY, KORBA

## Schedule of Requirements

### Package No.- 32

Package Name :- Networking & Wi-Fi

Sl	DESCRIPTION	Qty
1	Providing LAN (Local Area Network ) and WLAN (Wireless Local Area Network) connectivity including required hardware and software for network management at IT Korba Campus premises, computer labs (07 Nos) and office/ faculty cabins as per given campus/building layout, with 5 year AMC (after completion of guarantee /warranty period )	01 Job.

Sl No.	Code	Required Hardware	Approx. Qty
<b>Scope of Supply</b>			
1	NET_01	Wireless Access point 2.4 GHZ 300 Mbps. (Make / Cisco/D-Link/Net Gear). With Safety Box	52 Nos
2	NET_02	Wireless PCI Card 2.4 GHz 108 Mbps. (Make / Cisco/D-Link/Net Gear)	300 Nos
3	NET_03	Omni Antenna with Radio 5.08 Ghrz(Make: MicroTik)	4 Nos.
4	NET_04	Type-II 24 Port 100/1000 Gigabyte fiber switch with 2 fiber uplink port. (Make / Cisco/MicroTik/NetGear)	6 Nos.
5	NET_05	24 Port 100 mbps Ethernet Switch (Make / Cisco/TP-Link) Nonmanagable	12 Nos.
6	NET_06	Core Router Type-IA with inbuilt firewall. (Make / Cisco/Sonicwall) . (Suitable for 10/20 MBPS internet connection – VPNoBB connectivity)	01 Nos
7	NET_07	FOC -6 Core MMF (Fober Optic Cable , Multimode) (Make : Finolex/AMP)	2500 Mtr
8	NET_08	FO PP (LIU) 18 Port (Make: AMP)	02 Nos.
9	NET_09	SC Connectors (Pig Tail) (Make: AMP/Cisco)	10 nos.
10	NET_10	SC Patch Cord -3 M (Make : AMP/Cisco)	10 nos
11	NET_11	SC Patch Cord - 15 Mtr (Make : AMP/Cisco)	10 nos
12	NET_12	SC-MTRJ Patch Cord 3 Mtr. Make : AMP/Cisco)	10 nos
13	NET_13	MTRJ-MTRJ Patch cord -3 Mtr. Make : AMP/Cisco)	10 nos
14	NET_14	Ethernet Cable CAT-6 (Make: Finolex/D-Link/I-Ball)	18 Bundle (305 Mtr.)
15	NET_15	UTP jack Panel -24 Port Make: AMP/Cisco/D-Link)	06 Nos
16	NET_16	UTP Jack (I/O-Insert) Make: AMP/Cisco/D-Link)	300 nos.
17	NET_17	UTP Patch Cord 10 Feet (Make:AMP/Cisco/D-Link)	300 nos
18	NET_18	Face plate Singlex (Make:AMP/Cisco/D-Link)	300 nos.
19	NET_19	42-U Floor standing Rack (Make:AMP/Cisco/D-Link) .	01 Nos
20	NET_20	9 U wall mount Rack (Make:AMP/Cisco/D-Link)	20 Nos.
21	NET_21	FO Splice Enclosure Box (Make:AMP/Cisco/D-Link)	02 Nos.
22	NET_22	1" HDPE Conduit Pipe	2500 Mtr
23	NET_23	1" Casing and capping	(1200 Nos. 1 No.=7 Feet)
24	NET_24	600 VA UPS (Make – Microtec/APC/ Uniline)	10 Nos.
25	NET_25	2 KV UPS (Make – Microtec/APC/ Uniline)	02 Nos.

SI No.	Code	Required Hardware	Approx. Qty
1	NET_26	Enhancement of Security Management Software	For minimum 2000 clients and multiserver network environment
2	NET_27	Live Network Monitoring Software for LAN/WAN and fiber optic	
3	NET_28	Mail Server	
4	NET_29	Creating /Designing of internal intranet web page on internal web server with FTP, Local forum, Blog, Web Image gallery, circular /News bulletin Blog/Terminal CHAT (Voice/Video/File) facilities, streaming server (Audio/Video).	
5	NET_30	Hotspot Gateway with bandwidth management software.	
6	NET_31	Web Enable Proxy server	
<b>Annual Maintenance Contract :</b>			
1	NET_32	Annual Maintenance Contract AMC (After Completion of Guaranty/Warranty Period) Which includes hardware, software maintenance and servicing for entire network and related systems.	For 05 Years

**Note -**

**1. Tenderer/Bidder has to quote the rates and installation, commissioning charges for each above items separately on per unit basis. However work/ purchase order will be given to lowest bidder by calculating total amount of hardware/software/work for given quantity in tender.**

**2. If any item which has not been included in the above tender specification but compulsarily required for operation / running of network then tenderer may quote those items on per unit rate basis in a separate sheet with heading "Extra Essential Accessories".**