**UTKAL GOURAV MADHUSUDAN INSTITUTE OF TECHNOLOGY(U.G.M.I.T.), RAYAGADA: ORISSA-765001, TEL. 06856 222073**

**TENDER NOTICE**

**No._____/ UGMIT/ DATE:_____**

Principal, Utkal Gourav Madhusudan Institute of Technology(U.G.M.I.T.), Rayagada: Orissa-765001 invites sealed BIDs from Manufactures, authorized dealers and registered suppliers for supply of Equipment under MODROB Scheme for Electronics & Telecommunication Engineering Department . Interested eligible bidder may purchase the BID Document on payment of non-refundable fees of Rs.200/-(Rupees Two hundred) only in shape of Account Payee Demand Draft from any Nationalized Bank drawn in favour of "Principal, UGMIT, Rayagada" payable at Rayagada from 01.02.2010 to 02.03.2010 in all working days during office hours. All Bids must be accompanied by Bid security of 1% tendered value in shape of Account Payee D.D. along with copies of valid VAT clearance certificate and other relevant documents "Tender for Electronics & Telecommunication Engineering Department" The bidder failing which the bid will be liable for rejection. The BID security in other from like cash, personal cheque etc. will not accepted and in such case bid will be rejected. In case of outside State bidder, the concerned bidder is required to submit Orissa VAT clearance certificate along with the valid ITCC from the competent authority. The last date and time of receipt of BIDs is 02.03.2010 up to 3 P.M. and BIDs will be opened on 02.03.2010 at 5 P.M in presence of bidders who choose to remain present. The complete bidding document conforming to the terms and conditions for the bid should be sent to the Principal, Utkal Gourav Madhusudan Institute of Technology(U.G.M.I.T.), Rayagada: Orissa-765001. The Utkal Gourav Madhusudan Institute of Technology(U.G.M.I.T.), Rayagada shall not be responsible for non-receipt or late receipt of bid documents sent by post. Bid received late on account of any reason whatsoever will be rejected. The authority reserves the rights to reject any or all bids without assigning any reason thereof. The detail of equipment is available in the website www.dtetorissa.gov.in

Sd/-Principal,U.G.M.I.T.,
Rayagada.

**UTKAL GOURAV MADHUSUDAN INSTITUTE OF TECHNOLGY**

**P.O. / DIST: RAYAGADA-765001**.

**(ESTD-1979)**

**Govt. of Orissa.**

Bidding Document.

**MODROB PROJECT**
**OF**
**DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION ENGG.**

SUPPLY OF EQUIPMENT

**Utkal Gourav Madhusudan Institute of Technology, RAYAGADA**
**Phone : 06856- 222073(O), 222183( R )**
FAX-06856-222073

**Utkal Gourav Madhusudan Institute of Technology, RAYAGADA**
**Phone : 06856- 222073(O), 222183( R )**
FAX-06856-222073

## GENERAL TERMS & CONDITIONS OF CONTRACT FOR PROCUREMENT

1. **Eligible Goods and Services**

1.1 The Bidders shall quote the articles as per the Bid technical specification enclosed in **Annexure-VII** of reputed make, with their brand names/ISI specification and may quote alternative standards in the Bid. The articles quoted should have adequate after sales service facilities.

2. **Documents Establishing Bidder's Eligibility & Qualification**

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

a) That the Bidder who is not a manufacturer/ producer, has been duly authorized by the manufacturer/ producer to supply the goods.

b) That the Bidder (in case of manufacturers) has financial, technical and production capacity necessary to perform the contract.

c) That the Bidders ( in case of Registered suppliers) has executed supply of such items as mentioned in Schedule of Requirement of Goods to different Govt. Organizations/ Govt. PSUs.

d) Copies of valid VAT/STCC and ITCC/Non-Assessment Certificates shall be furnished by the Bidder and the originals of the above certificates shall be produced to the purchaser before placement of notification of award if asked for by the Purchaser. In case of outside State Bidders, the concerned firm is required to submit copy of the Non- Assessment Sales Tax Clearance Certificate issued by competent Sales Tax authority of the State of Orissa in favour of their firm along with copy of the VAT\CST & Income Tax Clearance Certificate. Any Bidder failing to submit the above documents the Bid of the firm may be rejected.

3. **Documents Establishing Goods Eligibility.**

3.1 The goods offered against the schedule of requirement of goods should be in accordance with the stipulated specifications.

3.2 The documentary evidence may be in the form of literature, pamphlets, manuals, drawing, circuit diagram etc. and shall furnish :

a) Detailed description of goods with essential technical and performance characteristics.

b) A list giving full particulars, including available source and current price of spare parts, special tools etc. necessary for proper and continuing function of the goods for a period of two years following the commencement of the use of the goods by the Purchaser.

4. **Bid Price**

4.1 The Bidder shall quote their lowest possible price and prices quoted by the Bidder shall be “fixed” during the Bidder’s performance of the contract and not subject to any variation and/or escalation.

4.2 The contract price shall include the cost of the Goods, Charges towards Packing, forwarding, handling, insurance, freight, incidental service, installation & commissioning of the goods and training to the consignee’s personnel at site.

4.3 The Supplier shall give operational training to at least two faculty of each consignee on the equipment / Computer Hardware & Peripherals/Computer Software free of any extra cost to the purchaser. The training may be arranged in the purchaser's premises or at the works of the manufacturer/ their authorized agent. If the training is conducted out side the consignee Institution, the living & incidental charges for the faculties consistent with their status shall be borne by the Supplier including the to & fro journey fare.

4.4 The Bidder shall furnish the break up of cost as follows solely for the purpose of facilitating the comparison of Bids only. The price must be stated separately for each item.

a) Ex-Factory/ Ex-Warehouse/ Ex-Showroom/ off the self price
b) Packing, Forwarding and Handling charges
c) Insurance charges
d) Freight up to destination Institution.
e) Erection, Assembly, commissioning, incidental service, including testing, training charges
f) Tax component ( i.e Excise Duty, Sales Tax, VAT other levies) payable by the Consignee.
g) Delivery cost at site (including Tax Component)

5. **Bid Security Deposit :**

5.1 All bids must be accompanied by the Bid Security **not less than1%** (one percent) of the tender value in shape of Demand Draft only drawn in favour of **Principal**, **Utkal Gourav Madhusudan Institute of Technology** payable at Rayagada**.**

5.2 The bid security is required to protect the Purchaser against the risk of Bidder's conduct which would warrant the security's forfeiture.

5.3 Unsuccessful bidders' bid security will be discharged or returned as promptly as possible but not later than thirty(30) days after the expiration of the period of bid validity prescribed by the Purchaser.

5.4 The successful Bidder's bid security will be discharged upon the Bidder signing the contract and furnishing the performance security.

5.5 The bid security may be forfeited if a Bidder withdraws its bid during the period of bid validity. In the case of a successful Bidder, if the Bidder fails to furnish performance security in accordance with Clause 6.

6. **Performance Security**

6.1 The successful Bidder shall furnish Performance Security within 21 days after the Supplier's receipt of **Notification of Award** for an amount equivalent to 5% (Five Percent) of the Contract Price in the form of Demand Draft or an irrevocable Bank Guarantee issued by a Nationalized Bank in favour of the Purchaser valid till 28 days after the date of expiry of defect liability period or the guarantee/warranty period as the case may be. The performance security form is enclosed in **Annexure-II** of the Bid Document.

6.2 The Performance Security will be discharged /refunded within one month after the expiry of guarantee/warranty period or the defect liability period.

6.3 The Performance Security shall be forfeited in case any terms and conditions of the contract are infringed or the bidder fails to make complete supply satisfactorily or complete the work within the delivery/completion period agreed in the contract without prejudice to the purchaser's right to take further remedial actions in terms of the contract and bidding documents which formed part of the contract.

7. **Delivery of Goods**

7.1 The delivery of goods shall be made by the supplier in accordance to the order placed to the Consignee as shall be detailed in the Schedule of requirement of Goods.

8. **Inspection/ Test**

8.1 The Purchaser or his representative shall have the right to inspect/ examine/ test the goods in conformity with the contract awarded/supply order.

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

8.3 The purchaser's right to inspect/ examine/test & where necessary to reject the goods after the arrival of the goods at the final destination, shall in no way be limited or waived by the reason of the goods having been inspected and tested by the manufacturer previously. In case of rejection of the goods at the final destination after inspection and test as stipulated above, the purchaser has to give sufficient reasons justifying such rejection.

8.4 In case any inspected/ tested goods fail to confirm to the specification/ working condition, the purchaser may reject them and the supplier shall replace/ repair the same free of cost.

9. **Payment Terms**

9.1 No advance payment is allowed by the Purchaser to the supplier for performance of the contract in question.

9.2 The standard payment terms(subject to recoveries, if any) upon submission of required documents shall be as follows :

Full 100% payment shall be made after /installation, and commissioning and demonstration of satisfactory performance and imparting training to the satisfaction of the consignee.

10. **Guarantee/Warranty**

10.1 The supplier shall supply the goods strictly as per the specification and time provided in the contract.

10.2 A. **Warranty maintenance Period for General Goods (except Computer Hardware & Peripherals)** shall remain valid for 24 months after Goods or any portion thereof as the case may be, have been delivered to the final destination indicated in the contract, or for 12 months after the Goods have been supplied/installed at the final destination indicated in the contract.

10.3 The Purchaser shall promptly communicate to the Supplier in writing of any claims arising under this warranty.

10.4 Upon receipt of such communication in writing, the supplier shall, with all reasonable time, repair or replace the defective Goods or parts thereof, free of cost within the guarantee period.

10.5 If the Supplier, having been noticed, fails to rectify the defect(s) within a reasonable period, the purchaser may proceed to take such remedial measures to repair the defective goods in question and shall reimburse the amount for such repair from the supplier. In that event, the Supplier shall pay the amount within a period of two weeks from the date of demand.

11. **Insurance**

11.1 The Purchaser will not pay separately for transit Insurance. The supplier is completely responsible for delivery of goods in perfect condition and shall replace/ rectify the missing/ defective parts if any at his own cost.

11.2 The goods to be supplied under the Contract shall be fully insured (**110%** of the Ex-Factory/ Ex-shop value of the goods) against loss or damage incidental to manufacture or acquisition, transportation, storage & delivery of the goods from Warehouse/ Factory/ Ex-shop of the supplier to the delivery point.

12. **Transportation**

12.1 The Supplier shall be required to meet all transport and storage expenses until delivery of the Goods covered in the contract to the Consignee.

13. **Incidental Services**

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

a) Furnishing of detailed literature/pamphlets/ circuit diagram/ operation & maintenance manual / drawings (as applicable) for each appropriate unit of supplied goods.

b) Furnishing of tools required for assembly and / or maintenance of the supplied goods.

c) Performance or supervision of on-site assembly and / or maintenance of the supplied goods.

d) Performance or supervision or maintenance and/ or repair of the supplied goods, for a period of time agreed by the parties, provided that this service shall not relieve the supplier of any warranty/ guarantee obligations under the contract.

e) Training of the Purchaser's personnel at the Supplier's plant and / or on site, in assembly, start up, operation, maintenance and/ or repair of the supplied goods.

f) A maintenance contract for the goods supplied, if required by the user beyond the warranty period shall be on mutually agreed upon terms between the user and supplier. The cost of such maintenance contract shall not be included in the Bid cost.

14. **Taxes and Duties.**

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

14.2 The Excise Duty is payable to Manufacturer quoting excisable items, on production of proof thereof, if claimed in the Bid offer.

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

14.4 C.S.T will be paid to the Suppliers of the outside State other than Orissa, if claimed in the Bid offer by observing the formalities.

14.5 Entry Tax, if paid by the Supplier, at the local (destination head) Corporation/Municipality/NAC is allowed once only on production of money receipt for such payment, if claimed in the Bid offer.

15. **Period of Validity of Bids**

15.1 The bid shall remain valid for a period of minimum 90 days for acceptance, from the date of opening of bid.

15.2 A bid valid for a shorter period may be rejected, as non-responsive.

15.3 In absence of any indication of the date of validity in the bid, it will be presumed that the offer will remain valid for the minimum period as prescribed above.

15.4 In exceptional circumstances the purchaser may solicit the bidders consent for extension of the period of validity. If agreed upon, the bid security so deposited shall also be suitably extended.

16. **Standards**

16.1 The Goods supplied under this Contract shall conform to the standards mentioned in the Technical Specifications and when no standard is mentioned, the Goods shall conform to the standards prescribed by the Bureau of Indian Standard (BIS).`

17. **Sealing and Marking of Bids**

17.1 The bidders shall submit bids which consist of both technical details and price in duplicate (i.e **marked as original & duplicate**) separately sealed and kept in single cover.

17.2 The inners and outer envelopes shall be:-

a) **Addressed to the Purchaser at the following address :**,
**Utkal Gourav Madhusudan Institute of Technology, RAYAGADA-765001, Orissa**

b) Bear **'PROCUREMENT OF EQUIPMENT FOR ETC DEPT."**(as mentioned in the tender notice)
**'DO NOT OPEN THE ORIGINAL BEFORE 02.03.2010 at 5PM'** (the last date & time of opening as indicated in tender notice).

17.3 The inner envelope shall indicate the name and address of the Bidder to enable the bid to be returned unopened in case it is declared 'late'.

17.4 If the outer envelope is not sealed and marked as required, the Purchaser will be responsible for misplacement or otherwise of the Bid.

18. **Deadline for Submission of Bids.**

18.1 Bids must be received by the Purchaser at the address specified not later than the date and time i.e. **02.03.2010 at 3 P.M** mentioned in the tender notice,

18.2 The Purchaser may, at its discretion, extend this deadline for the submission of bids.

19. **Late Bids**

19.1 Any bid received by the Purchaser after the date and time fixed for submission of bids will be rejected and / or returned unopened to the Bidder on that ground alone.

20. **Opening of Bids by Purchaser**

20.1 The Purchaser will open bids on **02.03.2010 at 5 P.M**, in the presence of Bidder's or duly authorized representatives who choose to attend, at the date & time of opening of the Bid mentioned in the tender Call Notice in the following location.
**O/o- The Principal, Utkal Gourav Madhusudan Institute of Technology, P.O: RAYAGADA – 765001, Orissa**
The Bidders' or duly authorized representatives who are present shall sign a register evidencing their attendance.

20.2 The name of the bidder/tenderer and the total amount of each bid along with important conditions like excise duty, sales tax, delivery terms, delivery period, special conditions and discounts, if any, shall be read out at the time of bid opening. Withdrawal notices and modifications to the Tender shall be read out first followed by the tender of the bidder/tenderer.

21. **Preliminary Examination**

21.1 The Purchaser will examine the bids to determine whether they are complete, whether any computational errors have been made, whether required securities have been furnished, whether the documents have been properly signed, and whether the bids are generally in order.

21.2 Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quality, the unit price shall prevail and the total price shall be corrected. If the supplier does not accept the correction of the errors, its bid will be rejected. If there is a discrepancy between words and figures, the amount in words will prevail.

21.3 Prior to the detailed evaluation, the Purchaser will determine the substantial responsiveness of each bid to the Bidding Documents. For purposes of these Clauses a substantially responsive bid is one which conforms to all the terms and conditions of the Bidding Documents without material deviations. The Purchaser's determination of a bid's responsiveness is to be based on the contents of the bids itself without recourse to extrinsic evidence.

21.4 Bids received without certified copies of ITCC & STCC/VAT valid up to preceding year issued by competent authority may be treated as non-responsive and liable for rejection.

21.5 Bids received without the requisite Bid Security shall be treated as non-responsive and shall be rejected.

21.6 The Purchaser may waive any minor informality or non-conformity or irregularity in a bid which does not prejudice or affect the relative ranking of any Bidder.

22. **Evaluation and Comparison of Bids**

22.1 The comparison shall be of ex-factory/ ex-warehouse/ off-the shelf price of the goods offered from within the Purchaser's country, such price to include all costs as well as duties and taxes paid or payable on components and raw-material incorporated or to be incorporated in the goods, the CIF port-of-entry price of the goods offered from outside the Purchaser's Country.

22.2 The Purchaser's evaluation of a bid will take into account, in addition to the bid price and the price of incidental services, the following factors :-

a) The purpose of tender evaluation is to determine substantially responsive tender with the lowest evaluated cost, but not necessarily the lowest submitted price, which should be recommended for award.

b) Evaluation of tenders should be made strictly in terms of the provisions in the tender documents to ensure compliance with the commercial and technical aspects.

c) The past performance of the suppliers will be taken into account while evaluating the tenders.

d) Cost of the inland transportation, insurance and other costs as per Clause 4 within the Purchaser's Country incidental to delivery of the goods to their final destination;

e) Delivery schedule offered in the bid;

f) Deviations in payment schedule from that specified in the General Terms & Conditions of Contract;

g) The cost of components, spare parts and service.

h) The availability in the Purchaser's country of spare parts and after-sales services for the goods offered in the bid;

i) The projected operating and maintenance costs during the life of the equipment/ goods.

j) The performance and productivity of the equipment/ goods offered;

k) The quality and adaptability of the equipment/ goods offered.

23. **Award Criteria**

3.1 The Purchaser will award the Contract to the successful Bidder whose bid has been determined as the lowest evaluated bid, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.

3.2 Quality, durability and adaptability of the equipment/ goods offered suiting to use in Training Practice shall continue to be the overriding factor for selecting any goods and determining the lowest evaluated bid.

23.3 The purchaser shall award the contract within the period of validity of tenders to the Bidder who meets the Tender condition in all aspects has the necessary technical and production capabilities and financial resources whose Bid is substantially responsive to the tender conditions and has offered the lowest evaluated cost.

24. **Purchaser's Right to Accept any Bid and to Reject any Bid**

24.1 The Purchaser reserves the right to accept or reject any bid and to annul the bidding process and reject all the bids without assigning any reason thereof at any time prior to award of Contract, without thereby incurring any liability to the affected Bidder or Bidders on the grounds of such action of the purchaser.

25. **Notification of Award**

25.1 Prior to the expiration of the period of validity of the Bid, the Purchaser will notify the successful Bidder in writing by registered letter or by Fax, to be confirmed in writing by registered letter or by speed post, that his bid has been accepted.

25.2 The notification of award will constitute the formation of the Contract.

25.3 Upon the successful Bidder's furnishing of the performance security, the Purchaser will promptly notify each unsuccessful Bidder and will discharge its bid security.

26. **Signing of Contract**

26.1 At the same time as the Purchaser notifies the successful Bidder that his bid has been accepted, the Purchaser will send the Bidder the Contract Form provided in the bidding documents(Annexure-VIII), incorporating all terms and conditions of the agreements between both the parties.

26.2 Within twenty one (21) days of receipt of the Contract Form, the successful Bidder shall sign and date the contract and return it to the Purchaser.

27. **Resolution of Disputes by Arbitration**

a) The Purchaser and the Supplier should try to resolve the disputes, if any, arising out of the contract, amicably between them, failing which the same shall be referred to the, **Principal, Utkal Gourav Madhusudan Institute of Technology, RAYAGADA- 765001, Orissa.**. for adjudication as the sole Arbitrator under the provisions of the Arbitration and Conciliation Act, 1996 whose decision will be final and binding on all the parties to the dispute.

28. **Jurisdiction of the Court.**

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

**Principal**
**Utkal Gourav Madhusudan Institute of Technology, RAYAGADA**

***Annexure-I***

**PRICE SCHEDULE FOR GOODS**
**(ITEM WISE)**

Bid No._____

Category_____

1. Item No. **:**
2. Item with specification **:**
3. Total quantity to be delivered **:**

   (Approx. quantity as shown in schedule of requirement)
4. Bid Price.
   a) Rate per unit at delivery point **:**
      (excluding tax component)
   b) Delivery cost at site (3 x 4a) **:**
5. Delivery period offered **:**
6. Break up Price (of SL – 4b)
   a) Ex-factory/Ex-ware house/Ex-show room/off the shelf price **:**
   b) Packing, for warding & handling charge **:**
   c) Insurance charge (if any) **:**
   d) Transportation cost up to institution **:**
   e) Erection, Assembly, Commissioning & incidental service **:**
   f) Delivery cost at site (excluding tax component)
      (Add 6a + 6e) = 4b.
7. Tax Components.
   a) Excise duty (if any) **:**
   b) VAT/Sales Tax and other levies (if any) **:**
   c) Total tax component (Add 7a + 7b) **:**
8. Delivery cost at site (including tax component)
   (Add 6f + 7c)

_____

Signature of the Bidder

***Annexure-II***

**PERFORMANCE SECURITY**

Bid No._____

Notification of Award No._____

Reference No.....
Bank Guarantee No.....

To

**The Principal,**
**Utkal Gourav Madhusudan Institute of Technology**
**P.O / DIST: RAYAGADA-765001(Orissa)**

M/s.....
(Address).....
.....
(The Supplier)

Where in the above supplier has undertaken in pursuance of contract for the above referred bid to supply the goods & services as mentioned in the notification of Award of Contract issued by you (the purchaser) in favour of the supplier.

Where as it has been stipulated by you in the said Notification of Award that the supplier shall furnish you with a Bank Guarantee by a Nationalized Bank for the sum as specified there in as security for compliance with the supplier's performance obligations in accordance with the contract.

And where as we have agreed to give the above named supplier a Bank Guarantee for the aforesaid purpose.

Therefore, we hereby guaranteed and affirm that we are guarantors and responsible to you on behalf of the supplier, up to a sum of Rs.....(Rupees .....) and we undertake to pay you, upon your first written demand is received by us without any demur or argument, any sum or sums within the limits of guarantee amount, as aforesaid, without your needing to prove or to show grounds or reasons for your demand of the sum specified therein.

We further agree not to revoke this guarantee without your written permission for a period of 3 years from the date of issuance of this Bank Guarantee.

_____

Signature of Authority of Guarantor Bank
Address and Seal.

Date :-

***Annexure-III***

**WARRANTY MAINTENANCE CONTRACT AGREEMENT**.

THIS AGREEMENT made the.....day of ....., 19.... between the The Principal, **Utkal Gourav Madhusudan Institute of Technology, P.O / Dist: Rayagada- 765001, Orissa** (hereinafter "the Purchaser") of the one part and M/s.....(hereinafter called "the Supplier") of the other part:

WHEREAS the Purchaser invited bids for certain Goods & ancillary services viz, supply, installation & commissioning of the equipment at Consignee site including Warranty Maintenance Services and has accepted a bid by the Supplier for the supply, installation & commissioning of the equipment specified below at the Consignee site including Warranty Maintenance Services for a period of 3 years/1 year from the date of installation & commissioning of the equipment as per award of Contract No..... dated

**Name of the Equipment/Software and Quantity.**

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

**NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:**

1. Maintenance Services shall consist of Preventive and Corrective maintenance of equipment specified above & will include repair and replacement of parts free of cost.

2. Preventive maintenance, monthly once, which includes:

   2.1 Check-up to ensure that device connection is proper, cabling is at proper condition etc.

   2.2 Cleaning of the above equipment & checking the System Performance.

3. The Supplier is to furnish the tentative schedule of the preventive maintenance (as mentioned in item 1 ) of Warranty Maintenance Contract (WMC ) to be carried out.

4. The parts replaced must be new parts or equivalent in performance to new parts.

5. The Supplier will also provide the same maintenance service in case of the movement of equipment from the place of original installation to a different place or location, if the equipment is shifted by the Purchaser to another place or location at the cost and risk of the purchaser.

6. Any complaint informed through telephone must be acknowledged with a Complaint No. by the Supplier which will be noted by Consignee. All further contact with the Supplier on such complaint will be initiated through that Complaint No. Once rectification done, that No. will be canceled by both parties. A register is to be maintained by the Supplier where complaints are to be noted along with Complaint No.

7. Shoes should be removed before entering into the Computer room or the place at Which the equipment has been installed.

8. The maintenance shall normally be done during working hours of the customer i.e from 10 AM to 5 PM. However, in case of emergency, maintenance may have to be done beyond office hours and even on holidays. Prior arrangement through proper communication should be worked out in all such cases by the Supplier & the Consignee.

9. The Service Engineer of the Supplier will be allowed to handle the respective equipment only in presence of the officer in charge at the Consignee site.

10. The Supplier should ensure that maintenance job is not hampered/delayed due to paucity of spares/inadequate man power etc.

11. The Supplier should submit the services call report, to the Consignee for each and every service
call without fail.

12. In case of delay/lack of communication, down time will be calculated as mentioned below in WMC Clause.

**WARRANTY MAINTENANCE CONTRACT (WMC) CLAUSE**

Normal response time for repair is 24 hours from the actual time of reporting of the problem to the Supplier.

| | **Period** | **Extension of WMC period** |
|---|---|---|
| Response Time | Above 24 hrs & below 48 hrs. | 2 days for delay of each day. |
| | Above 48 hrs & below 96 hrs | One Week for each day of delay |
| | Above 96 hrs | Two weeks for each day of delay |
| Down time | Above 24 hrs & below 48 hrs | Two days for each day of delay |
| | Above 48 hrs & below 96 hrs | One Week for each day of delay |
| | Above 96 hrs | Two weeks for each day of delay. |

13. The Supplier evaluation data format for the WMC of Consignee systems may be filled up for necessary action.

14. All formats after filled up should be signed at the end of each page by the Supplier.

15. After completion of the work/repair/maintenance, the Purchaser shall issue a certificate of completion to the supplier to that effect.

| | |
|---|---|
| Signature | Signature |
| For the Purchaser | For the Supplier |
| Name : | Name : |
| Designation : | Designation : |
| Address : | Address : |
| Telephone No : | Telephone No : |

***Annexure-IV***

**MANUFACTURES' AUTHORISATION FORM**

**No._____/ Date _____/**

To

**The Principal,**
**Utkal Gourav Madhusudan Institute of Technology, RAYAGADA -765001, Orissa.**
**Ph. 06856-222073, 222183**

Dear Sir, Tender No._____

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

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

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

Yours faithfully,

(Signature for and on behalf of Manufacturers)

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

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

***Annexure-V***

## CALCULATION OF BID SECURITY

| Item No. | Item Quoted | Approx. Qty. | Rate/Unit (Highest Quoted Rate) | Total Amount (in Rs.) |
|---|---|---|---|---|
| | | | | |
| | | | Grand Total : | Rs. |
| Bid Security Amount :-Not less than 1% of Grand Total Amount | | | | Rs. |

Signature of Bidder

***N.B. – Only highest rates (if alternate models quoted) of each item quoted are to be taken in to account for calculation of bid security.***

## PERFORMANCE STATEMENTS

**(In proof of Eligibility of bidder for a period of three years).**

| Order placed by the organisation with Address. | Order No & date | Stores ordered | Value of order | If the equipments are giving trouble free service. |
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**Signature of bidder**

## ANNEXURE-VII

**Detail Technical specification for the Project under MODROB scheme of Electronics and Telecommunication Engineering Department of U.G.M.I.T, Rayagada.**

| Sl.No. | Name of the Equipment | Specification |
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| 1. | ISDN Training System | This system should be available as single Box with accessible interface ports for connection of ISDN Telephones, Terminal adapters, Analog phones and Computer. The System must have control exchange, terminal equipments and protocol analyzer with hardware & software with complete accessories including working instruction manual & circuit layout. Easy operating instructions should be provided with interactive animation support having BRI interface for better understanding of theory with print out Option. System should be self sufficient to carry out experiments regarding understanding of ISDN and there usage. The system should operate with or without physical ISDN lines. |
| 2. | Data Communication Trainer Kit | This trainer kit should cover study of Serial and Parallel Communication port with software interface to study different protocols used in serial and parallel mode of data transfer. The Trainer kit should have serial and parallel port, Fiber optics, twisted pair, Copper Cable, Infrared link; Common FSK modem wireless protocols like stop & wait, LED's for Displaying Status port & Control port Data, printer interface etc with complete accessories including working instruction manual & circuit layout and test points should be provided on boards to observe necessary signals at input and output of each circuit block. |
| 3. | Satellite Communication Trainer Kit | Satellite communication technique and should consists of ground station transmitter, satellite emulator and ground station receiver. Ground station transmitter should uplink a given signal to a satellite emulator on one frequency and the emulator then should downlink the same signal at a different frequency to ground station receiver. For audio signal microphone should be provided at Transmitter and reproduced on built-in loud-speaker at Receiver. Video signal should be sent from CCD camera mounted on transmitter panel and viewed on a miniature video TFT monitor provided with the receiver. External broadband digital or analog data should be interfaced. ISM License free band used for operation. It must have facilities to transmit and receive signal Audio and Video and digital data for measurement of SNR, path loss with including all video & audio accessories, working instruction manual & circuit layout. |
| 4. | Antenna Training System | Antenna Trainer should be designed to perform various experiments and understanding the principle and working of commonly used antennas in the UHF, VHF & Microwave bound. The system must have antenna transmitter and receiver for testing. Antenna Polar plotting software for antenna analysis with antenna bandwidth, side and its angular position. It must be equipped with Dipole, Folded dipole, Yagi, Parabolic Disk, Helix, Slot, log Periodic, Discone etc. with complete accessories including working instruction manual & circuit layout. |
| 5. | Radar Trainer System (Advanced) | Radar Trainer System should provide hands-on experimentation and understanding of the principle and working of Doppler Shift Effect in Radar. The trainer should be capable of estimating the speed of a moving object, distance traveled by a moving object, frequency of vibrating object and reflections from objects. The Trainer should complete with complete all accessories including Transceiver etc working instruction manual & circuit layout. |
| 6. | A. Digital Communication System | Digital communication training system should be designed based on VLSI technology with inbuilt of Signal generation, Function generation, Data generator with various modulation and demodulation section based on different techniques, provision for encoded & decoded data, Filters, Fault Switches & Voice Communication on single circuit board. The system must have sampling, PCM, Delta mod, ASK, PSK, FSK, Data encoding, Multiplexing, Compounding, Error correction and Detection techniques etc with complete accessories including working instruction manual & circuit layout. |
| | B. Analog Communication System | Analog communication trainer system is a complete range of analog Communication techniques in a modular fashion including Modulator & Demodulator with complete accessories including working instruction manual & circuit layout. The system must have<br>1. AM transmitting & receiving kit<br>2. FM transmitting & receiving kit<br>3. FDM transmitting & receiving kit<br>4. Noise power spectral density kit<br>5. Fourier Synthesis kit |
| 7. | Microwave Test Bench & Power Meter (Klystron / Gunn | Microwave test bench consisting of power supply, Microwave Source with Detector and Monitor and Microwave components, Isolator ,Wave Meter, Matched Termination, Detector |

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| | based)<br>A. Microwave Test Bench | Mount, Waveguide Short, Variable Attenuator, Digital SWR Meter, Slide screw Tuner, BNC to BNC Cable, BNC to Open Cable, Waveguide Stand including all accessories for conducting various experiments on Microwave with working instruction manual and circuit layout. |
| | B. Microwave Power Meter | Microwave power meter should measure signal frequency within the wide frequency range of 50MHZ to 12.4GHZ Microwave power meter should measure power levels from 1uW up to 100mW with complete accessories including working instruction manual & circuit layout. |
| 8. | Wave & Propagation Trainer | Wave and Propagation Trainer is should cover the concept of wave properties & propagation results, concept of Reflection, Retraction, Polarization, Diffraction, Interference, Standing wave and Interferometer etc. with complete set of all accessories including power supply and various test point inter connects impedance matching work, Digital Display with instructor manual & circuit layout. |

**TOOLS AND EQUIPMENT LIST FOR ELECTRONICS & TELECOMMUNICATION DEPARTMENT UNDER MODROB SCHEME**

**1.DIGITAL ELECTRONICS LAB:**

| Sl.No. | Name of the Equipment | SPECIFICATION |
|---|---|---|
| 1 | MULTIVIBRATORS USING TRANSISTORS | To investigate the operation & characteristic of the astable multi vibrator, monostable multivibrator using transistor. Astable multimeter is free running rectangular wave generator. It has two output which are 180 Degrees out of Phase. Monostable is one –shot multivibrator and it is triggered by sharp pulse, obtained by differentiating a square wave. It produces one out put pulse for each input pulse. A bistable is flip-flop & it is stable either in "1" or "0" state, till it is triggered into their other state. Output changes for every two input triggeres. It can also be used as divide – by – two counter.<br>Built in regulated power supply: +5 V/300 mA, 230V AC / 50 HZ MAINS OPERATED. |
| 2 | MULTIVIBRATORS USING OPAMP | To design & demonstrate the operation of a stable (Free running), monostable (One shot) & bistable (Two stages) multivibrators using OPAMP. Built in regulated power supply: +15 V/150 mA, -15 V/150 mA,<br>230V AC / 50 HZ MAINS OPERATED |
| 3 | MULTIVIBRATOR USING DIGITAL IC | To design & demonstrate the operation of an stable , mono stable multivibrator, using digital ICs .Built in regulated power supply: +5 V/300 mA, 230V AC / 50 HZ MAINS OPERATED |
| 4 | MULTIVIBRATOR USING IC - 555 TIMER | To demonstrate the operation of an stable , mono stable multivibrator, using timer – IC "555".Built in regulated power supply: +5 V/300 mA, 230V AC / 50 HZ MAINS OPERATED |
| 5 | SCHMITT TRIGGER (TRANSISTOR & IC BASED) | To construct an emitter – coupled Schmit Trigger using transistor, to observe that this produces a rectangular wave output from a sine wave input, to construct Schmit Trigger using OP-AMP, to observe that any increase in amplitude of input sine wave has an effect on the width of the output wave form & to verify these facts using IC-7413.<br>230V AC / 50 HZ MAINS OPERATED |
| 6 | COUNTER USING 555 & LDR | Depending upon the intensity of resistance value of LDR varies & that vary the frequency of 555 output, Built in regulated power supply: +5 V/300 mA, 230V AC / 50 HZ MAINS OPERATED. |
| 7 | CONTINUITY TESTER USING 555 | To test any PCB or any circuit by hearing the output on 8 Ohm Speaker or Buzzer Built in regulated power supply: +9 V/300 mA, 230V AC / 50 HZ MAINS OPERATED |
| 8 | BASIC LOGIC GATES (DIODES & TRANSISTORS) | To construct OR, AND, NOR, NAND, NOT gates using Diodes, Transistors & resistors and to verify the Truth table of each gate. Low & High points are provided as input. LEDs are provided as output.<br>Built in regulated power supply: +5 V/300 mA, 230V AC / 50 HZ mains operated. |
| 9 | NAND, NOR, INVERTER GATES (IC BASED), VERIFICATION OF DEMORGAN'S THEOREMS & BOOLEAN EXPRESSIONS | To verify Demorgan's Theorems by using combinational gates & to verify the Boolean expression. Switches are to be provided as inputs. LEDs are provided as outputs .<br>Built in regulated power supply: +5 V/300 mA, 230V AC / 50 HZ mains operated. |
| 10 | EXCLUSIVE – OR and EXCLUSIVE – NOR GATES, HALF & FULL ADDER & HALF & FULL SUBSTRACTOR | To Construct of Adder, Half Subs tractor using AND & EXOR gates & to verify the Truth Table .To construct full Adder and Full Substractor and to verify the Truth Table.<br>Built in regulated power supply: +5 V/300 mA, 230V AC / 50 HZ MAINS OPERATED. |
| 11 | R-S/ D/ T FLIP FLOPS | To construct R-S flip flop using NAND gates and to verify its Truth table . Delay flip flop (D-flip flop ) type and T type flip flop. Switches are to be provided for |

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| | | inputs and LEDs are to be provided to monitor output.<br>Built in regulated power supply: +5 V/300 mA, 230V AC / 50 HZ mains operated |
| 12 | QUADRUPLE JK FLIP FLOPS, WITH PRESET & CLEAR USING IC 7476 (STUDY OF(STUDY OF SHIFT REGISTOR & ASYNCHRONOUS-COUNTER) | To verify the Truth table of JK flip flop & to construct shift register, asynchronous counter , Ring counter , Johnson's counter.<br>Built in regulated power supply: +5 V/300 mA, 230V AC / 50 HZ mains operated |
| 13 | MASTER SLAVE JK FLIP FLOP USING NAND GATES | To construct Master slave JK flip flop using NAND gates & to verify its Truth table . Switches & LEDs are provided as inputs & outputs .<br>Built in regulated power supply: +5 V/300 mA, 230V AC / 50 HZ mains operated. |
| 14 | DECIMAL-BINARY ENCODER DIODE MATRIX | To construct Decimal to binary using Diode matrix encoder. LEDs are provided to monitor the binary outputs .<br>Built in regulated power supply: +5 V/300 mA, 230V AC / 50 HZ mains operated. |
| 15 | NAND GATE ENCODER | To construct decimal to binary encoder using 4 input NAND gates & verify the encoding. LEDs are provided to monitor the outputs.<br>Built in regulated power supply: +5 V/300 mA, 230V AC / 50 HZ mains operated |
| 16 | BCD-7 SEGMENT DECODER (SUITABLE FOR COMMON ANODE & COMMON CATHODE DISPLAY) | To study the operation of Common ANODE & CATHODE type display . The BCD inputs are given by logic switches , which are decoded by the decoder IC & display will show the corresponding decimal equivalents.<br>Built in regulated power supply: +5 V/300 mA, 230V AC / 50 HZ mains operated |
| 17 | EXCESS 3 – DECIMAL CONVERTER | To construct excess 3 decimal converter & verify the outputs .<br>Built in regulated power supply: +5 V/300 mA, 230V AC / 50 HZ mains operated |
| 18 | DECADE COUNTER, DECODER DRIVERS & 7 SEGMENT DISPLAY(WITH 1 HZ SQUARE WAVE GENERATOR) | It should generate 1 HZ square wave. It should have got counter, decoder driver & digital displays.<br>Built in regulated power supply: +5 V/1 A, 230V AC / 50 HZ mains operated |
| 19 | CHARACTERISTICS OF CMOS ICS | To study the characteristics of CMOS Integrated Circuits, to know the operation of the CMOS inverter ?NAND gate ICs and verify the same. To study logic voltage level of C-MOS for proper ON or OFF (Logic 1 or 0) condition. To verify the compatibility of 2 C-MOS ICs , C-MOS device have extremely lower power consumption.<br>Built in regulated power supply +12 V/300 mA, +5 V/300 mA.<br>230V AC / 50 HZ mains operated. |
| 20 | ARITHMETIC LOGIC UNIT DEMONSTRATOR USING 74181 IC | To demonstrate the operation a 4 bit arithmetic logic units and then to verify the truth table for all 16 logic functions and 16 arithmetic functions. Switches are provided are inputs , LEDs are provided to monitor the binary outputs. 7 segment display with recorder is also provided.<br>Built in regulated power supply +5 V/1A, +3.6 V/300 mA. 230V AC / 50 HZ mains operated |
| 21 | 4BIT BINARY FULL ADDER & SUBTRACTOR | To demonstrate the operation of IC 7483(4 bit binary full adder & subs tractor , having input & output carry bits. Any two , 4 bit binary numbers can be added or subs tractor using complementary techniques .<br>Built in regulated power supply +5 V /300 mA. 230V AC / 50 HZ mains operated |
| 22 | 4-BINARY UNIVERSAL SHIFT REGISTER | To construct a digital data transmitter & receiver that can interchange serial digital data, (4 bit universal shift registers). This is an extremely interesting and useful experiment in digital data communications.<br>Built in regulated power supply +5 V /300 mA. 230V AC / 50 HZ mains operated. |
| 23 | 4-BIT BINARY UP-DOWN COUNTER, USING 74192 (SYNCHRONOUS COUNTER) | To construct up counting (0-9) using IC 74192 & down counter (9-0) carry & borrow LEDs are provided.<br>Built in regulated power supply +5 V /300 mA. 230V AC / 50 HZ mains operated. |
| 24 | RANDOM ACCESS MEMORY (16 WORDS OF 4 BITS) | To demonstrate how digital data to WRITE (Store) into the Semi-conductor memory & how to READ (Retrieve) this data from the memory using IC 7489. It is organized as 16 words by 4 bit scratch pad.<br>Built in regulated power supply +5 V /300 mA. 230V AC / 50 HZ mains operated. |
| 25 | READ ONLY MEMORY TRAINER KIT | To demonstrate ROM & verify the truth table this serves as 16 word by 4 bit memory .<br>Built in regulated power supply +5 V /300 mA. 230V AC / 50 HZ mains operated. |
| 26 | COMPARISON OF DIFFERENT TYPES OF JK FLIP-FLOPS | To understand how a JK flip flop works & to verify its truth table. To understand the significance of preset and clear inputs. To understand the significance of positive – edge triggering, negative – edge triggering, & Level triggering. To demonstrate the operation of JK Flip Flop , & Comparing & contrasting the behavior of these types of triggering & applications.<br>Built in regulated power supply +5 V /300 mA. 230V AC / 50 HZ mains operated. |
| 27 | ANALOG TO DIGITAL CONVERTER | Using the DAC circuit & add a comparator & appropriate control circuit to create an ADC. The output of the controls the clock input to the counter, which in turn provides the input to the DAC. LEDs and 7segment display are provided to monitor the Digital Read out.<br>Built in regulated power supply +5 V /1A,+12 V/150 mA, -12V/150 mA. 230V AC / 50 HZ mains operated. |

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| 28 | DIGITAL TO ANALOG CONVERTER | To demonstrate the operation & application of modern LSI D/A converter. Parallel binary inputs from switches will be applied to the DAC, which in turn converts the binary numbers into a proportional out voltage.<br>Built in regulated power supply +5 V /300 mA. 230V AC / 50 HZ mains operated. |
| 29 | LEFT / RIGHT SHIFT REGISTER | To demonstrate data routing, loading a shift registers & the shift left/right operation.<br>Two logic switches provided logic inputs, De bouncing pulser switch is provided in this trainer.<br>LED indicator are provided to observe to logic output status .<br>Built in regulated power supply +5 V /300 mA. 230V AC / 50 HZ mains operated. |
| 30 | RECIRCULATING SHIFT REGISTER | To demonstrate the data routing , loading a shift register.<br>Two logic switches provided logic inputs, De bouncing pulser switch is provided in this trainer.<br>LED indicator are provided to observe to logic output status .<br>Built in regulated power supply +5 V /300 mA. 230V AC / 50 HZ mains operated. |
| 31 | DIGITAL IC TESTER | IC pack- Digital Ics upto 20 pins in DIP package, IC type-Tristate, open collector & bidirectional Ics., Test by – Truth table comparison, ZIF -20 Pin DIP SIF, Keys – 12 keys rubber keypad, Display – 16 character LCD dot matrix display, Power – Battery operated 6 No. 1.5V battery; Also socket to feed external 9 V, 200 mA DC input. |
| 32 | DIGITAL LOGIC | It is a very versatile and completely self contained laboratory Instruments with built in Universal IC regulated power supply.<br>This consists of the fundamental Logic gates like AND, OR, NOR, NAND, EX-OR, FLIP-FLOPS, DECODERS,MULTIVIBRATORS, DIGITAL DISPLAY, DECADE COUNTER etc.<br>It has got several junction points on the front panel convenient to make combinational logic gates.<br>It has got four logic switches for giving input and it has got four LEDs( LED glows for logic high and does not glow for logic low.<br>This trainer is a printed circuit board and all the symbols are screen printed on the front panel.<br>The trainer is provided with on committed IC base where all types of digital IC characteristics can be studied .<br>This is how to strong elegant fibre cabinet.<br>Specification- 1)Power supply +5V/750 mA, 2) Logic state: Logic high (1) at 3.6 V, logic low (0) at 0 V. , 3) LED Logic indicators : 1 digital display with built in decoder. |

**2.COMMUNICATION ENGG LAB:**

| Sl.No. | Name of the Equipment | SPECIFICATION |
|---|---|---|
| 1 | TELEVISION TRANSMITTER | The trainer should demonstrate the following operation :<br>❖ Watching one VCD from only where on the house<br>❖ Using CAM coder camera to watch remote areas<br>❖ Hidden camera fun<br>❖ Home TV station<br>❖ Student TV station<br>❖ The trainer should operate on :<br>❖ 12 to 15 V DC<br>❖ On board whip antenna<br>❖ Stable o/p adjustable to channel 3-6<br>❖ Clear ,consise ,step by step instructions<br>❖ Video and audio I/P compatible with any VCD or TV camera<br>230v Ac / 50 HZ Mains Operated |
| 2 | AM TRANSMITTER | The trainer should have the features as follows :<br>❖ Great for transmitting yourTAPE,DECK,CD player or voice throughout the house,yard or car<br>❖ Powerful enough for neighbourhood radio station<br>❖ Easily tunes to any clear channel on the AM broadcast band from 530 to1750 KHZ<br>❖ Superior performance<br>❖ Adjustable I/P level –can be configured for line level or Microphone I/P.<br>❖ Unit runs on 12 V DC (built in Regulated Power supply)<br>ACCESSORIES:<br>▪ Dynamic Microphone<br>▪ AM Radio Receiver |

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| | | ▪ Set of Hook up wires<br>▪ Instruction Manual<br>Trainer should come with metal sloping cabinet for better viewing<br>230v Ac / 50 HZ Mains Operated |
| 3 | AM RECEIVER | The trainer should have the features as follows :<br>❖ LED AM/FM Indicator<br>❖ A DC AM /FM switch facility<br>❖ Three separate stabilizers to enable operation over a wide range of supply(1.8-5 V)<br>❖ All pins (except pin-10) are ESD protected<br>❖ Single glass epoxy printed circuit board<br>❖ Mounted on a strong fibre cabinet<br>❖ Power supply 6V<br>230v Ac / 50 HZ Mains Operated |
| 4 | FM TRANSMITTER | The trainer should have the features as follows :<br>Great for transmitting yourTAPE,DECK,CD player or voice throughout the house, yard or car,<br>FM transmitter with add mike pre-amp ,<br>Transmits upto 300 meters.<br>Tune88-108 MHz band,<br>Runs on 9VDC(Built in regulated power supply),<br>Complete with applications and step by step instruction manual.<br>ACCESSORIES:<br>FM condenser mike,<br>FM receiver.<br>Trainer should come with metal sloping cabinet for better viewing.(CNC Machine Finish).<br>230v Ac / 50 HZ Mains Operated |
| 5 | FM RECEIVER | The FM circuit should incorporate:<br>An RF input amplifier, A double balanced mixer, A 'One-pin' oscillator, Two IF amplifiers (for distributed selectivity), A quadrature demodulator for a ceramic filter, Internal AFC.<br>230v Ac / 50 HZ Mains Operated |
| 6 | MOBILE COMMUNICATION | The trainer should have the features as follows :<br>1) Signal waveform analysis should be easily done by built-in measurement functions.<br>2) System block diagram, design and analysis points displayed in the panel.<br>3) Test point being analyzed provided in the trainer.<br>EXPERIMENTS:<br>1) Working principles of GSM Mobile communication trainer.<br>2) Study of faults that normally occur.<br>3) Study of waveforms.<br>ACCESSORIES: Mobile phone charger.<br>230v Ac / 50 HZ Mains Operated |
| 7 | TRANSMISSION OF LASER BEAM THROUGH AN OPTICAL FIBER | To study various types of losses that occur in optical fibers and measure the loss in dB of optical fiber patch cords in individually and also connected in tendem using an in-line adapter.<br>To study the losses due to mismatches. The patch cords designated for the experiments are as follows: Cable 1:2 –meter PMMA S1/MM, Cable 2:2 – meter 100/140 G1/MM, Cable 3:2 – meter 62.5/125 GI/MM.<br>230v Ac / 50 HZ Mains Operated |
| 8 | AM BROADCAST TRANSMITTER | The trainer should track the following aspects:<br>Great for transmitting your tape deck, CD player or voice throughout the building, Easily tunes to any clear channel on the AM broadcast band-from 530 to 1750 KHz, Demonstrate the principle of commercial transmitters as well, Superior performance transmits upto 1 mile, Adjusting input level can be configured from line level or Microphone input, Operates on 9 – 12 VDC<br>230v Ac / 50 HZ Mains Operated |
| 9 | RF TRANSMITTER | LC based 300 MHz AM RF transmitter board .When used with the TX-01 Encoder motherboard, RE-99 receiver board & RE-01 decoder mother board. This generates 4 bits of data providing about 16 different codes 8 bits of address ensures that data sent from this transmitter are passed on the RE-01 data o/ps, & all stray are rejected. The 8- bit address also allows the use of upto 256 individually addresse3d receivers to the user with single transmitter.<br>Trainer operates on 5 VDC with an operating current of 1.6 mA, at an frequency range of 3200 MHz uses LC based AM circuitry.<br>230v Ac / 50 HZ Mains Operated |
| 10 | ALL BAND HF, VHF, UHF, ACTIVE ANTENNA | The trainer is meant to study the following operation of an Active Antenna: Great for perking up scanner reception, Dual pre-apmp HF, VHF/UHF front panel switching, this circuit based on true active antenna research, Performance rival units costing many times more, Front panel RF gain controls, Uses dual gate MOSFET technology for low noise HF amplification and a high gain microwave transistor for VHF/UHF, Includes internal telescopic whip antenna plus auxiliary antenna input jack for jazzing up existing antenna, Informative manual comes along with the trainer.<br>230v Ac / 50 HZ Mains Operated |

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| 11 | RADAR SIGNAL DETECTOR | To study dual op-amp & super tiny amp to detect traffic violations. , responds only to modulated signals & operates on +9V dc.<br>230v Ac / 50 HZ Mains Operated |
| 12 | ANALOG COMMUNICATION | Trainer should consists of the following circuit diagrams:<br>Amplitude modulation(AM) Transmitter & AM receiver, Frequency Modulator(FM), Phase Modulator(PM), FM Receiver, Quadrature detector (demodulation) , Phase-Locked Loop (PLL) circuit, Balanced Modulator & balanced Demodulator, Built in microphone with amplifier, Built in loud speaker.<br>ACCESSORIES:<br>Instruction manual, set of patch cords.<br>230v Ac / 50 HZ Mains Operated |
| 13 | DIGITAL COMMUNICATION-1 | The trainer should be a single glass epoxy printed circuit board with legends neatly screen printed on the front side & all the components are soldered back side of the PCB to avoid tampering of fixed components like resistors, capacitors, transistors, diodes, & variable components like potentiometers are mounted on the fron side of the PCB for making linear measurements.<br>It should have following Features:<br>Each circuit block should contain s a modulator for transmission & a demodulator for receiption, Built-in channel simulator and speaker amplifier circuitary., The channel simulator circuit block enables the student to investigate the effects of noise & channel bandwidth on pulse & digital moidulation signals., Communication signals synchronized for easy display.<br>The trainer should consists of the following circuit diagrams:<br>Pulse Amplitude Modulation(PAM), Pulse-Time Modulation(PTM), Pulse-Code Modulation, Pulse Amplitude Modulation-Time-Division Multiplexing (PAM-TDM), Delta Modulation(DM).<br>ACCESSORIES: Instruction manual, set of patch cords.<br>230v Ac / 50 HZ Mains Operated |
| 14 | DIGITAL COMMUNICATION-2 | It should have following Features:<br>The Channel simulator circuit block & a Bit Error Rate (BER) counter enable the student to evaluate the effects of noise on ASK & PSK modulated carrier signals. The Modem circuit block contains FSK/ QPSK modem IC, which the student uses in a loop-back mode to observe the entire signal path. Communication signals synchronized for easy display.<br>The trainer should consists of the following circuit diagrams:<br>Line Encoding, Modsulator, Channel simulator, Sync Detector, Modem. ACCESSORIES: Instruction manual, set of patch cords.<br>230v Ac / 50 HZ Mains Operated |
| 15 | AMPLITUDE MODLATION & DEMODULATION | To construct Amplitude Modulator using transistor and to demonstrate how much intelligence can be added to a carrier and observe the Amplitude modulated wave forms and check the percentage of modulation.<br>To demonstrate how intelligence can be recovered from an Amplitude modulated carrier by using diode demodulator.<br>It should contain RF Oscillator, AM Modulator & AM Demodulator.<br>Built in regulated power supply +15V/300mA, 230v Ac / 50 HZ Mains Operated |
| 16 | FREQUENCY MODULATION & DEMODULATION | To demonstrate how the Modulating signal changes frequency of the carrier rather than Amplitude and observe the Frequency Modulated wave form on CRO.<br>To study the changes in carrier center frequency and to study the frequency deviation.<br>To study how the Phase Lock Loop can be used for demodulation and the Audio Signal is demodulated.<br>Built in regulated power supply +5v/150mA, -5V/150mA ,+15V/300mA, 230v Ac / 50 HZ Mains Operated |
| 17 | PHASE MODULATION | To Demonstrate how a carrier's instantaneous phase angle is made to vary in proportion to the modulating signal's amplitude, the effect of frequency deviation when the modulating signal crosses zero axis , how phase change occurs when the modulating wave changes polarity from + to – and from – to +.<br>To demonstrate why phase modulation is some times called as indirect FM. Built in regulated power supply +15V/300mA ,230v Ac / 50 HZ Mains Operated |
| 18 | BALANCED MOIDULATOR (DOUBLE SIDE & SINGLE SIDE BAND) | To construct & properly adjust a balanced modulator, study its operation. To observe that the output is a double side band, with a suppressed-carrier signal. To adjust it for optimum carrier suppression. To verify that the input audio-level directly affects the double side-band output amplitude. To observe that the output is minimum with zero audio input. To measure carrier only output and the peak side-band output, to calculate the carrier suppression. Built in regulated power supply +12V/300mA,230v Ac / 50 HZ Mains |
| 19 | SUPPRESSED CARRIER-DOUBLE SIDE BAND BALANCED MODULATOR (DIODE-BRIDGE TYPE) | To construct a carrier wave generator and the balanced modulator (diode bridge type). To observe that the output is a double side band suppressed carrier signal. To verify that the input audio level directly affects the double side-band output amplitude. Built in regulated power supply +15V/300mA,230v Ac / 50 HZ Mains Operated. |
| 20 | PULSE AMPLITUDE MODULATION & DEMODULATION | To construct a pulse amplitude modulation generator & to observe the characteristics of both single & dual-polarity pulse amplitude modulation. To construct a PAM generator, using an IC – timer as a sampling clock. To observe how its output can control a C-MOS sampling switch. To identify that this output wave is a dual-polarity PAM, To adjust the depth & frequency of modulation, to obtain a Single-polarity PAM from this circuit, by adding a DC reference level to |

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| | | the input sine wave. To observe that the output waveform is a single Polarity PAM. To observe the demodulated waveform using detector. Built in regulated power supply +12V/300mA<br>230v Ac / 50 HZ Mains Operated |
| 21 | PULSE POSITION MODULATION & PULSE WIDTH MODULATION | To construct a pulse position carrier generator, To show how this pulse position modulation (PPM) is modulated by any external AF modulating frequency. To observe that the position/width of the pulses are altered although the amplitude of the modulating frequency is varied. To establish the relationship between the pulse position/width variation and amplitude of the modulating frequency, To observe that the pulse height is constant although the amplitude of modulating frequency is varied. Built in regulated power supply +5V/300mA,230v Ac / 50 HZ Mains Operated |
| 22 | PULSE POSITION & PULSE WIDTH DEMODULATION | To construct the pulse-position and pulse width demodulation training board. To show the pulse width and pulse position modulation signal is demodulated. To show that the P.W.M. demodulated output is nearly the same as the modulating frequency by using phase locked loop demodulator. Built in regulated power supply +9V/150mA, -9V/150 mA.,230v Ac / 50 HZ Mains Operated |
| 23 | TIME DIVISION MULTIPLEXER | To construct a pulse duration modulator, to construct 3 – channel time division multiplex generator, which uses pulse duration modulation (PDM)? To measure the characteristics of Time Division Multiplex generator and verify its operation. Built in regulated power supply +5V/300mA,230v Ac / 50 HZ Mains Operated |
| 24 | FSK TRANSMITTER | To construct an FSK transmitter, similar to those used in data communications systems and simplex made of operation, To measure its “LOW” output frequency (900 Hz to 1000 Hz) when its data input terminal is grounded and “HIGH” output frequency (1100 Hz to 1200 Hz) when its data input terminal is connected to Vcc . To connect the data input terminal to the square-wave signal that simulates a data pulse train that changes the output signal’s frequency shift in response to the square-wave input. Built in regulated power supply +15V/300mA ,230v Ac / 50 HZ Mains Operated |
| 25 | FSK RECEIVER | To construct an FSK receiver, using a phase-locked loop and an operational amplifier to demodulate the FSK signal, by adjusting the PLL to the centre of the FSK signal. To prove this fact by comparing the steady state 8 input and output levels (i.e.) the PLL output followed the input level exactly. Built in regulated power supply +/- 5V/300mA,230v Ac / 50 HZ Mains Operated |
| 26 | PULSE CODED MODULATION & DEMODULATION | It should consist of the main pulse coder & decoder. The frequency & amplitude of the required clock generator, pulse generator and the audio generator should be adjusted. In PCM the message signal is sampled and the amplitude of each sample is rounded off to the nearest one of a finite set of allowable values, so that both time and amplitude are in discrete form. This should allow the message to be transmitted by means of coded electrical signals. It should consist of built in Pulse generator (sync pulse) of frequency up to 1.5 MHz., Clock generator of frequency (Clock pulse ) up to 9 KHz,, Audio generator (Sine wave ) of frequency up to 4 KHz. Built in regulated power supply +/-5V/150mA, +/-15V/150mA, +5V/1 A<br>230v Ac / 50 HZ Mains Operated |
| 27 | AM/FM SIGNAL GENERATOR | 230v Ac / 50 HZ Mains Operated |
| 28 | DEMODULATOR CIRCUITS USING DIODE & TRANSISTOR | 230v Ac / 50 HZ Mains Operated |
| 29 | PHASE SHIFT KEYING MODULATOR/ DEMODULATOR | It should consist of the following features Data Input, Carrier generator, Phase shift keying Modulator & PSK Demodulator.<br>Frequency selector:- X1 – 1KHz to 10KHz(Approximately), X10 – 5KHz to 100 KHz Amplitude: (0-10)V (p-p)<br>230v Ac / 50 HZ Mains Operated |
| 30 | QUADRATURE PHASE SHIFT KEYING MODULATOR/ DEMODULATOR | It should have the following features :- Programmable gain, 3-wire transmission bus , PLL controlled carrier frequency, 5V supply voltage. It should consist Two PLLs are incorporated, the first PLL includes: - A fixed main divider, A crystal oscillator and its programmable reference divider, A phase/frequency detector ,combined with a fixed charge pump. The second PLL includes: - A divide-by-four preamplifier, A 12-bit programmable divider, A crystal oscillator and its programmable reference divider, A phase/frequency detector, combined with a programmable charge pump which drives the tuning amplifier, including 30 V output,<br>230v Ac / 50 HZ Mains Operated |
| 31 | FREQUENCY DIVISION MULTIPLEXING & DEMULTIPLEXING | To study a frequency division Multiplexer and De multiplexer which works by dividing the incoming frequency by a fixed factor. To study DC coupled AC comparator, Amplitude Retaining circuit, Chopping, Sine wave approximation, Frequency division by multiplexing.<br>230v Ac / 50 HZ Mains Operated |
| 32 | TRANSISTOR RADIO RECEIVER | 230v Ac / 50 HZ Mains Operated |

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| 33 | TONE CONTROL (BASS & TREBLE) | To study the low frequency nd high frequency characteristics using Tone control circuit. Built in regulated power supply +15V/150mA<br>230v Ac / 50 HZ Mains Operated |
| 34 | RATIO DETECTOR | It should use a double-tuned transformer to convert the instantaneous frequency various of the FM input signal to instantaneous amplitude variations. The trainer should have the features:- In built audio oscillator, in built carrier generator. Built in regulated power supply +15V/300mA<br>230v Ac / 50 HZ Mains Operated |
| 35 | PHASE DISCRIMINATOR | To study of Phase Discriminator using Flip-Flop edge triggered phase detector. Built in regulated power supply +5V/300mA<br>230v Ac / 50 HZ Mains Operated |
| 36 | SSB TRANSMITTER / RECEIVER TRAINER (2UNITS) X-23(1&2) | SSB Transmission system trainer should have the following stages:- Buffer amplifier section, Balanced Modulator section, Filter Network section, Driver amplifier (Linear amplifier) section, Linear power amplifier section, Crystal oscillator section, Base band amplifier section.The section should be printed with multi coloured front panel . 230v Ac / 50 HZ Mains Operated & inbuilt DC Regulated power supply.<br>SSB Detection system should use product detection method, which includes JFET, which operates on the depletion mode, that has the IF signal applied to the gate through an IC tuned circuit formed by L1 and C3, C4. The carrier signal is generated by a Beat Frequency Oscillator and inserted on the source through the LC tuned circuit of L2 and C1, C2. The circuit operates similar to mixer and is biased to provide the peak value composite signal required to detect & recover the base band signal. 230V AC / 50 HZ Mains Operated. |
| 37 | BINARY PHASE SHIFT KEYING MODULATOR & DEMODULATOR | Binary phase-keying (BPSK) has only two phases, 0 and 1. It is therefore a type of ASK with f(t) taking the values -1 or 1 and its bandwidth is the same as that of ASK. Phase-shift-keying offers a simple way of increasing the number of levels in the transmission without increasing the bandwidth by introducing smaller phase shifts. It should consists of the following features. Clock Generator: Output Wave form – Square, Frequency-100 KHz, Amplitude -10V (P-P) fixed.<br>Audio Oscillator:<br>Frequency- Sine, Frequency – 200 Hz-2KHz, Amplitude – 0-10V(P-P). Regulated Power supply +5V/500mA, -5V/500mA.<br>230V AC / 50 HZ Mains Operated |
| 38 | AMPLITUDE SHIFT KEYING MODULATOR/ DEMODULATOR | To study the technique that the carrier wave is multiplied by the digital signal f(t) . It should consists of the following features. Clock Generator: Output Wave form – Square, Frequency-10KHz - 100 KHz, Amplitude -10V (P-P).<br>Audio Oscillator:<br>Frequency- Sine, Frequency – 200 Hz-2KHz, Amplitude – 0-10V(P-P). Regulated Power supply +5V/500mA, -5V/500mA.<br>230V AC / 50 HZ Mains Operated |
| 39 | ANALOG SIGNAL SAMPLING | To demonstrate how analog signals are sampled and how different sampling rates affect the output. Built in regulated power supply +5VDC/300mA, +(0-9)V-VAR. 230V AC / 50 HZ Mains Operated |
| 40 | AM/FM RADIO RECEIVER DYNAMIC DEMONSTRATOR | To study of AM/FM Radio receiver.<br>The AM Circuit should incorporate:<br>A double balanced mixer, 'One pin' oscillator with amplititude control operating in the 0.9 to 30 MHz frequency range, Split-up IF amplifier, A detector, An AGC circuit which controls the IF amplifier and mixer, Trainer is single glass-epoxy printed circuit board , the trainer is mounted on a strong fibre cabinet.<br>The FM Circuit should incorporate:<br>An RF input amplifier, A double balanced mixer , A 'one-pin' oscillator, Two IF amplifiers(for distributed selectivity), A quadrature demodulator for a ceramic filter, Internal AFC.<br>Power supply- +9V/500 mA.230v Ac / 50 HZ Mains Operated |
| 41 | CRO DYNAMIC DEMONSTRATOR | Comprehensive trainer to teach about working of single beam Oscilloscope to study the power supply, vertical amplifier, horizontal amplifier, vertical deflection plate, horizontal deflection plate, focus, intensity, astigmatism and CRT circuit.<br>Trainer is to be designed in a single PCB with each section printed in multi-colour for easy identification. All test points are drawn from Oscilloscope & can be connected to the trainer with the help of 15 pin connector.<br>Power 230V AC / 50 HZ Mains operated. |
| 42 | EPABX DYNAMIC DEMONSTRATOR | It should be packed with various features to understand the complete working of communication through electronic Exchange.<br>It should be provided with various fault inducing switches and test points are to be derived from important sections like microcontroller, opto isolator, matrix switch and programmable array logic.<br>The schematic block diagram of EPABX Exchange is to be screen printed on the front panel. The trainer should be provided with four extensions to study |

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| | | various programming techniques .<br>Features: Extension to extension call , trunk camp on, conference, call pick up. Dynamic locking, simultaneous ringing, direct out ward dialing, call consult, call forwarding, call waiting, last extension recall, pulsing on trunk, auto call back, call split, follow me, delayed hot line, dial hunting.<br>Power 230V AC / 50 HZ Mains operated |
| 43 | RADIO DYNAMIC DEMONSTRATOR | Versatile super heterodyne receiver designed to understand all the functions of single band transistor receiver.<br>Single PCB & all necessary components are mounted inside the PCB and the circuit diagram is printed on the PCB.<br>It should have antenna coils, Local Oscillator, RF amplifier, IF amplifier, Diode detector, Audio amplifier and power amplifier with volume control.<br>Built in power supply +5V /500mA & 230V AC / 50 HZ Mains operated |
| 44 | FACSIMILE DYNAMIC DEMONSTRATOR | A complete educational system designed to give a clear, accurate and realistic insight into the working of the FAX trainer.<br>Designed on CAD system and the specifications as follows<br>Type: Desk top transceiver,<br>Applicable line: Public switched telephone network<br>Compatibility: CCITT Group 3<br>Scan method: Horizontal contact image sensor, Vertical intermittent scanning by stepper motor.<br>Print method: Thermal Printing<br>Recording Paper Size: 216mm x 15 M, outer diameter= 40mm.<br>Recording width= 216mm.<br>Resolution: Horizontal- 8 dots/mm and Vertical- Standard model-3.85 lines/mm, fine mode- 7.7lines/mm<br>Coding Scheme: MH<br>Modem: V.29, V.27 ter with fallback function.<br>Modem Speed: 9600/7200/4800/2400 bps ( Automatically fallback)<br>Power supply: Single Phase 220V /50 HZ ac mains operated.. |
| 45 | OPTO ELECTRONIC TRAINER | To Study The Characteristics Of Opto Electronic Components.<br>Trainer Should Have The Following Components:<br>Photo Cell,Photo Diode,Photo Transister, Opto Coupler,Light Emitting Diodes (Various Colours),Seven Segment Display (Common Cathode & Common Anode),5x7 Dot Matrix Display, Solar Cell, Resistors (47E,180E,1K,4K7,1M,100K,10K),Capacitor(100MF,1MF,0.1MF,0.022MF,0.001 MF,100PF),Diodes(1N4148,1N4001),Potentiometers(1K,100K,1M) & OUTPUT DEVICES(6V BULB,12V RELAY,BUZZER) & Clock Generator: 555 Timer, 230V AC / 50 HZ Mains operated. |
| 46 | ANALOG MULTIMETER DEMONSTRATOR (BASIC METER, EXTENSION OF CURRENT & RESISTANCE RANGES, AC/DC VOLTAGE RANGES) | To study the working of an Analog Multimeter.Selection of ranges should be made by patching waves . Built in power supply +15V /300mA, +1.5V /300mA & 230V AC / 50 HZ Mains operated |
| 48 | Microwave Test Bench & Power Meter (Klystron / Gunn based)<br>A. Microwave Test Bench | Microwave test bench consisting of power supply, Microwave Source with Detector and Monitor and Microwave components, Isolator ,Wave Meter, Matched Termination, Detector Mount, Waveguide Short, Variable Attenuator, Digital SWR Meter, Slide screw Tuner, BNC to BNC Cable, BNC to Open Cable, Waveguide Stand including all accessories for conducting various experiments on Microwave with working instruction manual and circuit layout. |
| | B. Microwave Power Meter | Microwave power meter should measure signal frequency within the wide frequency range of 50MHZ to 12.4GHZ Microwave power meter should measure power levels from 1uW up to 100mW with complete accessories including working instruction manual & circuit layout. |

## CHECK LIST:

### DOCUMENTS TO BE SUBMITTED IN

**Technical Bid**

| | | |
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| 1. | Accepted Terms and Conditions. | YES / NO |
| 2. | .EMD amount | YES / NO |
| 3. | .Detail Specifications alongwith leaflet, literature. | YES / NO |
| 4. | Performance statements as per annexure-VI | YES / NO |
| 5. | Authorisation from manufacturer. as per annexure- IV | YES / NO |
| 6. | VAT clearance certificate. | YES / NO |
| 7. | Delivery period of supply. | YES / NO |
| 8. | Demand draft/Money Receipt towards purchase of tender Papers package wise. | YES / NO |

***Annexure - VIII***

# CONTRACT FORM

**THIS AGREEMENT** made the .....day of....., 20….. Between ..... ……..... *(Name of purchaser)* ……..... *(Country of Purchaser)* (hereinafter called "the Purchaser") of the one part and ..... ……. *(Name of Supplier)* of ..... *(City and Country of Supplier)* (hereinafter called "the Supplier") of the other part :

**WHEREAS** the Purchaser is desirous that certain Goods and ancillary services viz., ..... *(Brief Description of Goods and Services)* and has accepted a bid by the Supplier for the supply of those goods and services in the sum of ..... *(Contract Price in Words and Figures)* (hereinafter called "the Contract Price").

**NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:**

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.

2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz.:
   (a) the Bid Form and the Price Schedule submitted by the Bidder;
   (b) the Schedule of Requirements;
   (c) the Technical Specifications;
   (d) the General Conditions of Contract;
   (e) the Special Conditions of Contract; and
   (f) the Purchaser's Notification of Award.

3. In consideration of the payments to be made by the Purchaser to the Supplier as hereinafter mentioned, the Supplier hereby covenants with the Purchaser to provide the goods and services and to remedy defects therein in conformity in all respects with the provisions of the Contract.

4. The Purchaser hereby covenants to pay the Supplier in consideration of the provision of the goods and services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

   Brief particulars of the goods and services which shall be supplied / provided by the Supplier are as under:

| Sl. No. | Brief Description of goods & services | Quantity to be supplied | Unit price | Total price | Delivery terms as per contract. |
|---|---|---|---|---|---|
| | | | | | |

**As mentioned in Schedule of requirement of Goods**

**Total Value :** Rs. inclusive of taxes and duties

(Rupees ) only

**Delivery Schedule :** On or before

In WITNESS where of the parties hereto have caused this Agreement to be executed in accordance with their respective laws the day and year first above written.

Signed, Sealed and Delivered by the

Said…… (For the Supplier)

In presence of ……..

Signed, Sealed and Delivered by the

Said…….. (For the Purchaser)

In presence of ……..