

कार्यालय प्राचार्य शासकीय पॉलीटेक्निक, मुंगेली (छ.ग.)

ग्राम व पोस्ट- धरमपुरा, तहसील- जरहागांव, जिला-मुंगेली (छ.ग.) Email:- polymungeli@rediffmail.com

क्रमांक / शापोमुं / भण्डार / 2020-21 / ...20..... /

मुंगेली, दिनांक:- 04/01/2021

निविदा सूचना

प्राचार्य, शासकीय पॉलीटेक्निक मुंगेली की ओर से निर्माताओं तथा उनके अधिकृत विक्रेताओं से विभिन्न विभागों में उपकरण क्रय करने हेतु सीलबंद निविदायें आमंत्रित की जाती है।

स.क्र.	विभाग का नाम	उपकरण क्रय की अनुमानित राशि	धरोहर राशि
1	मेकेनिकल इंजीनियरिंग	1716000 /-	51480 /-
2	इलेक्ट्रीकल इंजीनियरिंग	883600 /-	26508 /-
3	सिविल इंजीनियरिंग	1756900 /-	52707 /-

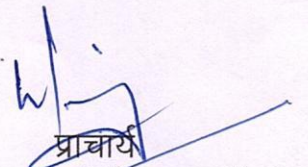
निविदा प्रपत्र कार्यालय प्राचार्य शासकीय पॉलीटेक्निक मुंगेली से आवेदन प्रस्तुत कर प्राप्त कर सकते हैं। निविदा प्रपत्र का मूल्य रुपये 500/- है। निविदा प्रपत्र वेबसाइट www.govtpolymungeli.ac.in तथा www.cgdteraiipur.cgstate.gov.in से प्राप्त किया जा सकता है किन्तु निविदा प्रपत्र हेतु निर्धारित शुल्क रुपये 500/- का डीडी जो प्राचार्य शासकीय पॉलीटेक्निक मुंगेली के नाम देय हो। निविदा प्रपत्र के सुरक्षानिधि लिफाफे में रखें अन्यथा यह माना जावेगा कि उसने निविदा प्रपत्र विधिवत् रूप से क्रय नहीं किया है। निविदा के संबंध में तिथियां निम्नानुसार हैं-

निविदा बिक्री की अंतिम तिथि:- 06.02.2021 समय शाम 05.00 बजे तक

निविदा जमा करने की अंतिम तिथि:- 08.02.2021 समय दोपहर 03.00 बजे तक

निविदा खोलने की तिथि:- 08.02.2021 समय दोपहर 04.00 बजे

बुलाई गई निविदा को किसी भी समय अधोहस्ताक्षरकर्ता द्वारा बिना कारण बताये निरस्त किया जा सकेगा।


प्राचार्य
शासकीय पॉलीटेक्निक मुंगेली
जिला- मुंगेली (छ.ग.)
मोब.- 94791 76258

OFFICE OF THE PRINCIPAL
GOVERNMENT POLYTECHNIC, MUNGELI, DISITT – MUNGELI (C.G.) 495334
 e-mail Address:- polymungeli@rediffmail.com

TENDER - DOCUMENT

FOR

PURCHASE OF EQUIPMENTS

(2020 - 2021)

निविदा सूचना क्रमांक/शार्पोमु/स्टोर/2020-21/200 /मुंगेली, दिनांक 04.01.2021

1. Value of Machine /Equipments

Approx Rs 17.16 Lacs (Rs. Seventeen Lacs Sixteen Thousand only) for Mechanical Engg.
 Approx Rs 8.83 Lacs (Rs. Eight Lacs Eighty Three Thousand only) for Electrical Engg.
 Approx Rs 17.56 Lacs (Rs. Seventeen Lacs Fifty Six Thousand only) for Civill Engg.

2. Tender document issued to

M/s-----

3. Cost of Tender

Rs 500-00 (Rs Five Hundred only)

4. Money receipt & Date

5. Date of issue of tender

Issued by

Principal,

Government Polytechnic Mungeli
 Disitt – Mungeli, CG

Principal

Govt. Polytechnic Mungeli
 District-Mungeli(C.G.)

OFFICE OF THE PRINCIPAL
GOVERNMENT POLYTECHNIC, MUNGELI, DISITT – MUNGELI (C.G.) 495334
 e-mail Address:- polymungeli@rediffmail.com

No./Tech/GPM/Store//2020-21/...../

Mungeli, Dated ...04.01.2021

Sealed Tenders are invited from the intended manufacturer/authorized dealer/distributor for supply of Goods/ Equipments/ Machine to Government Polytechnic Mungeli Disitt. – Mungeli (C.G.). Details are as follows. Suppliers are required to submit separate tender for each part through only registered post. Other form of submission of tender documents are not acceptable.

1.	Last Date and time for Issue of Tender	06/02/2021 (5:00 PM)
2.	Last Date and time for Receiving Sealed Tender	08/02/2021 (3:00 PM)
3.	Date and time of opening the tender	08/02/2021 (4:00 PM)
4.	Tender fee	Rs. 500
5A	EMD for Mechanical Engg.	Rs. 51480=00
5B	EMD for Electrical Engg.	Rs. 26508=00
5C	EMD for Civil Engg.	Rs. 52707=00

TERMS AND CONDITIONS

Terms and conditions for supply of Machines/ Equipments are as per following list:

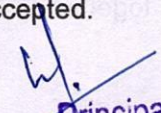
1. For participation in tender process following signed and stamped documents must be furnished in envelope A – super scribed as “Technical Bid envelope A”.
 - a. Income Tax returns of the last three years and Commercial Tax clearance certificate as well as PAN/TAN/TIN/GST registration No. with documental proof.
 - b. Registration of firm/company.
 - c. Sales tax/GST clearing certificate.
 - d. GST certificate from commercial tax department for the related business. GST Registration certificate must be valid and live. In GST Registration certificate the items of tender must be clearly mentioned.
 - e. ISO/BIS certificate for firm/product.
 - f. Manufacturer/dealer/distributor certificate.
 - g. Balance sheet /Turnover of firm/company of last three years duly signed by CA.
 - h. Demand Draft for Tender fee (if downloaded from website) and Demand Draft for EMD.
 - i. Item specifications/Literature /Brochure / leaflet regarding quoted items.
 - j. Acceptance of terms and condition (signed and stamped copy of tender document).

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 District-Mungeli (C.G.)

- m. The bid shall be accompanied by Proforma for DECLARATION FOR NOT BLACKLISTED in Annexure-III.
- n. The bid shall be accompanied by affidavit in prescribed format as given in Annexure-IV on non judicial stamp paper or Rs 50 certified by Notary.
2. Envelope B should contain Financial bid in Proforma as given in Annexure-II along with taxes and discount if any and super scribed as "Financial Bid envelope B".
 3. Both envelope A & B should be put in a third big envelope and Super scribed as "Tender for supply and installation of machine/equipment" All envelope should be signed and should be sealed on all joints.
 4. Sealed envelope for the tender should be super scribed as tender Notice No....., dated-..... should be addressed to Principal, Government Polytechnic, Mungeli Vill.- Dharampura, District – Mungeli (CG) Pin No. 495334 Tender forbe clearly mentioned on the envelope (at Left- hands side Top Corner).
 5. Envelope-A of Technical bid and documents will be opened first and if it is found worth consideration then only the Financial bid Envelope –B will be opened.
 6. The tender is liable to be rejected if not submitted as per the prescribed conditions and in the prescribed format in envelope A and B .as given in point 1 & 2 .No further clarification will be entertained.
 7. The suppliers should quote their offer/ rate in clear terms without any ambiguity. Discount if any must be clearly specified.
 8. If the same supplier is submitting tender for more than one part then duplicate documents /certificates are not required. Only one set of documents is sufficient.
 9. The tender will be opened on the date and time given above in the presence of tenderer(s) or their representative who desire to be present.
 10. Tender received after due date and time will not be entertained.
 11. Tender form is non transferable.
 12. The tender document is also available on the website <http://govtpolymungeli.ac.in> & cgdteraipur.cgstate.gov.in tenderer can downloads the document from the website, in that case he has to deposit DD of Rs 500-00 in favor of **Principal, Government Polytechnic, Mungeli Distt – Mungeli (C.G.)** at the time of submission of tender. Otherwise his tender will not be entertained.
 13. A soft copy of the tender should be submitted along with the tender document.
 14. Item no. and page no of the tender form should be strictly in chronological order. Make/model, name of the manufacturer with complete address should be mentioned against each item and equipment.
 15. The tender should be sent in firms own letter pad along with terms and conditions. Printed condition on the back of the tender will not be binding unless separately mentioned.
 16. The tenderer must furnish complete and detailed technical specification supported by printed literature/catalogue/leaflet of the equipment offered. Item no. and page no. of the equipment should be mentioned in it. Incomplete specifications/ absence of printed literature support may result in to the rejection of the tender.
 17. The rate should be FOR destination (**Govt. Polytechnic, Mungeli, Village & P.O. – Dharampura Tehsil - Jarhagaon, Distt - Mungeli (C.G.)**) including all taxes, packing forwarding, transportation etc. Warranty/Guarantee installation if any on any item it should also be stated clearly.
 18. Taxes, (whichever is applicable state clearly item wise) if leviabale extra, should be clearly indicated, failing which the rate quoted in the tender will be considered as inclusive of all taxes.
 19. There should be no alterations / corrections made in the Tender. The quoted rate should be in figures and words both. The tenderer may quote the rate of any or all the items listed in the tender form. Rates should be quoted separately for individual item and not in lump-sum for all taken together.

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District-Mungeli(C.G.)

20. The tender should clearly indicate whether the equipment is complete in itself. If in the opinion of the tenderer, certain accessories are necessary with the type of the equipment tendered, the tenderer must quote for aforesaid accessories under the heading "extra but essential".
21. The tenderer are required to deposit EMD separately for each head The EMD should be deposited in the form of Demand Draft drawn in favor of **Principal, Government Polytechnic, Mungeli** payable at **Mungeli Disitt – Mungeli (C.G.)** against tender -----
-----Mungeli Disitt – Mungeli, dated -----. Tenders received without EMD will be rejected. Requests for relaxing EMD will not be entertained. EMD by cheque or MO will not be accepted.
22. In case of non- acceptance of the tender the EMD will be refunded to the tenderer in due course of time without interest. 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. The order shall stand cancelled and security deposit forfeited if.
- (I) Supplier expresses his inability to execute the order for the quoted items within validity period of the tender at the rate quoted in the tender and for makes/ brand quoted in the tender.
 - (II) The complete equipment is not supplied within the delivery period mentioned in the order or within the extended period permitted.
 - (III) The supplier executes only a part of the order.
23. Any Equipment/ Trainers/ Hardware or software breakdown must be attended within 48 hours during the valid warranty period of the equipment/ software, free of cost.
24. Payment shall be released after the successful installation and demonstration/testing of the machine equipment at the institution.
25. The training for at least two persons for handling the machine/equipments shall be testing provided by the supplier at his own cost.
26. The tenderer has to give demonstration/testing of the machine/ equipments software at **Government Polytechnic- Mungeli Disitt – Mungeli (C.G.)** wherever necessary at his own cost.
27. The one time extension in the delivery period may be granted at the discretion of the undersigned. The penalty at a rate of 2% per month of the full cost of the equipment is liable to be charged for the extension of the delivery period.
28. Equipment received after the delivery period or dispatched after the delivery period mentioned in the order will also be subjected to this penalty.
29. In case of any default in execution of the order, the undersigned reserves the right to forfeit the EMD/Security deposit. The undersigned also reserves the right to cancel the order and forfeit the EMD/Security deposit in case the tenderer fails to adheres strictly to all terms and condition of the order/ tender.
30. If defects of any kind or deviations from the specification are detected and reported to the supplier, the supplier should make replacement or rectify the defects free of cost within 10 days from the date of report, failing which the equipment will not be accepted and will be taken back by the supplier at his own cost and risk, and the EMD will be forfeited, In case the equipment is sent for repairs to the firm, it should be repaired within 10 days. From the date of receipt of equipment failing which the same will not be accepted and EMD will be forfeited, however the undersigned may consider the delay in deserving cases at his/her discretion.
31. The undersigned reserves the right to increase/ decrease the quantity of the equipment to be supplied. If equipment supplied are not according to the ordered specifications and are not of proper quality, the same will not be accepted .Similarly second hand, reconditioned, damaged, repaired and substandard equipments and equipment having poor workmanship would not be accepted. Only brand new equipment calibrated in SI unit and with fine workmanship will be accepted.


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32. The submission of the tender will be deemed to be the acceptance of all the terms and condition of the tender as stated herein and/ or elsewhere in the tender document.
33. Tenders should be valid upto 31th March. The prices should be firm without variations of any kind.
34. The undersigned reserves the right to accept the lowest or any tender and also of rejecting whole (all) or any part of tender without assigning any reasons for the same or to split up the tender as he/she may deem fit.
35. Exact and earliest possible time of delivery should be indicated in the tender against each item. 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.
36. No advance payment will be made. The successful tenderer will have to execute in the form as approved by Government of Chhattisgarh.
37. If tenderer has supplied these items to any PSU/ Government/reputed Private firm/deptt. Then submit last three years PSU/ Government/ Private Supply record as far as possible.
38. The minimum guarantee/warranty period for the equipment supplied by the supplier should be mentioned clearly and should not be less than one year from the date of installation. The tenderer will be required to undertake repair/ replacement of defective parts free of cost at the institution during the guarantee period.
39. All the disputes with regard to the contract of purchase of equipment etc. is subjected to **Mungeli Chhattisgarh** Jurisdiction only.
40. In the event of the order, supplier who is the manufacturer of the equipment will be required to furnish a certificate to the effect that they are manufacturers of such and such make whereas the authorized dealer/distributor will have to furnish certificate issued by the manufacturer certifying that tenderer is their authorized dealer/distributor of that product/item. Without this certificate tender will not be accepted.
41. The tenderer shall guarantee that after sales services will be provided as and when required. Replacement or repair of part should be done and delivered free of cost at this institution within guarantee/warranty period.
42. The supplier will render necessary assistances, if required, in the installation of the equipment/ machinery in the institute/ site free of charge.
43. No. offer should be made for imported item for which import license has to be arranged by the Tenderer. The entire imported item will have to be delivered in the institute and payment will be made in rupees.
44. The payments shall be released only after satisfactory and successful commissioning and installation of the equipment/ machinery at the designated site/ institute and on submission of bill by the firm.
45. The rate quoted should preferably be net, inclusive of all taxes and duties, packing forwarding, freight, insurance and other incidental charges. In case these charges quoted extra in addition to the quoted rates, the amount there of must be specified.
46. In the event of any dispute arising out of the tender or from the resultant contract, the decision of the Principal, **Government Polytechnic, Mungeli Disitt – Mungeli (C.G.)** will be final.
47. The Tender document/ resultants contract will be interpreted under Indian laws.
48. If the successful tenderer, on receipt of the order fails to execute the order within the stipulated period, in full or part it will be open to the **Principal, Government Polytechnic, Mungeli Disitt – Mungeli (C.G.)** to recover liquidated damage from the firm at the rate of 2% of the value of undelivered goods per month or part thereof, subject to a maximum of 5% of the value of undelivered goods. Alternatively, it will also be open to the Principal, Government Polytechnic Mungeli Disitt – Mungeli (CG) to arrange procurement of the required goods from any other source at the risk and expenses of the tenderer.
49. The undersigned is not responsible for any loss or damage to the equipments during transit irrespective of the fact that they are insured or not insured or delivery is ex- go down or factory station.


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50. No claim shall be entertained in respect of interest on Earnest Money/Security deposit/ Tender Deposit.
51. Inspection of the equipment will be carried out at the institution after receipt of the equipments. Any request for the inspection of the same at the firm's factory/ go down/ showroom etc. will not be accepted.
52. Illustrated operation manuals, pamphlets/catalogue/literature/working instructions, trainers, software and hardware, erection/ wiring details as the case may be of the ordered equipments must be supplied in suitable damp proof cover. Without operational/ instruction manual no equipment/machinery will be accepted.
53. If there is any variation of specification of any machine /equipment from tendered specification, it should be clearly mentioned. Specification nearest can also be considered if it is as per technical norms for the given equipment/machinery.
54. Tenderer should mention list of spares, tools and accessories provided along with equipment without any extra cost.
55. Only actual manufacturer or their authorized dealer/distributor may submit the tender .It is mandatory to have ISO/BIS certification for supply/manufacture of the item/equipments/ machineries. Only BIS/ISO /ISI certified item has to be quoted.
56. The bidder shall submit a signed and stamped (on each page) copy of tender document as testimony of acceptance of T&C of tender document.
57. No octroi/excise duty shall be paid by the institution.
58. All prices quoted and other information in this regard having a bearing on the price shall be written both in figures and words in the prescribed offer form. If there is a discrepancy between words and figures, the amount mentioned in words will prevail. All prices should be in Indian National Rupees (INR).
59. Tenderer shall be entirely responsible to pay all Government. (Central and State) GST Taxes & DUTIES, custom duties and levies, sales tax, payable on components, raw materials any other items used for their consumption or dispatched directly to respective location of **Government Polytechnic, Mungeli Disitt – Mungeli (C.G.)**.
60. All provisions of Chhattisgarh Store Purchase Rules 2002, with all amendments upto the date of publication of this tender, shall be applicable.

Principal,
Government Polytechnic Mungeli
Disitt – Mungeli (C.G.)

Govt. Polytechnic, Mungeli
District - Mungeli (C.G.)

GOVERNMENT POLYTECHNIC, MUNGELI, DISITT – MUNGELI (C.G.) 495334**ANNEXURE - I****Format for Technical Bid to be put in envelope A only****(Please provide hard copy as well as soft copy (CD) in MS. Words/M.S. Excel Format in the envelope)**

S. No.	Name of Items along with Make and model	Specifications given in the Tender	Technical Specification the bidder wants to supply as per catalogue/ brochure	Brochure/ literature/ catalogue attached Yes/No	Remark
1	2	3	4	5	6

Signature:

(Name & stamp of the Firm/tenderer)

GOVERNMENT POLYTECHNIC, MUNGELI, DISITT* – MUNGELI (C.G.) 495334**ANNEXURE - II****The Price offer should be submitted in the following format envelope B only****(Please provide hard copy as well as soft copy (CD) in MS. Words/M.S. Excel Format in the envelope)**

Sl. No.	Name of Items along with Make/ Model	Specifications given in the Tenders	Technical Specification which the bidder wants to supply as per Catalogue/ Brochure	Price of the Equipment excluding (GST) In Rs.	(GST) %	GST In Rs.	Cost of the Equipment Inclusive of all taxes & charges sum of column 5&6	Remark
1	2	3	4	5	6	7	8	

Signature:

(Name & stamp of the Firm/tenderer)

4/

Principal
Govt. Polytechnic, Mungeli
District-Mungeli (C.G.)

ANNEXURE - III

DECLARATION FOR NOT BLACK LISTED

Date.....

To,

The Principal,
Government Polytechnic Mungeli,
Disitt – Mungeli,(C.G.).

Dear Sir,

Ref.:- Tender No.

I/We hereby confirm that our firm has not been banned or blacklisted by any Government organization/Financial Institution/Court/Public sector Unit/ Central Government.

Place

Signature of Bidder

Date

Name

Designation

Seal

Sl. No.	Name of items along with Make and Model	Specifications given in the Tender	Technical Specification which the bidder wants to supply as per Catalogue	Price of the Equipment excluding GST in Rs.	GST in %	GST in Rs.	Cost of this Equipment inclusive of all taxes & charges sum of column 5&6	Remark
1								
2								
3								
4								
5								
6								
7								
8								

Principal
Govt.Polytechnic,Mungeli
District-Mungeli(C.G.)

Signature
(Name & stamp of the Firm/Bidder)

ANNEXURE-IV

(On Non Judicial Stamp Paper of Rs. 50/-)

निविदाकर्ता Bid के साथ दिए 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 लिए वचनबद्ध है।
2. मेरे/हमारे द्वारा संलग्न किए गए 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 सामग्रीयों के लिए जो स्पेशिफिकेशन दिया गया है। और उनके सपोर्ट में जो भी संबंधित दस्तावेज, कैंटलॉग/ब्रोशर्स आदि संलग्न किए गए हैं उनमें लिखा विवरण निर्माता द्वारा जारी किया गया है एवं मूल रूप में है, और उनमें कोई फेरबदल या कांट-छांट नहीं किया गया है।
4. मेरे/हमारे द्वारा निर्माता से मुझे/हमें जारी अथॉराइजेशन प्रमाण-पत्र जो कि बिड के साथ संलग्न किया गए हैं। वे सही एवं मूल रूप में हैं और उनमें कोई फेरबदल नहीं किया गया है।
5. मैं/हम दिए गए क्रयादेशानुसार सामग्रीयों को निर्धारित समय सीमा में स्पेशिफिकेशन के अनुसार सप्लाई करने के लिए बाध्य है। देर होने या सामग्रीयों के स्पेशिफिकेशन में अन्तर होने पर मुझे/हमें दिए गए क्रयादेश को निरस्त किया जा सकता है, एवं शासन को होने वाले नुकसान की भरपाई मेरे/हमारे द्वारा की जावेगी।
6. टेण्डर के तहत प्राप्त क्रयादेश द्वारा प्रदाय की जाने वाली सामग्रीयों में लगने वाले सभी शासकीय (केन्द्र व राज्य) GST Taxes & DUTIES, custom duties and levies, sales tax इत्यादि का भुगतान करने की सम्पूर्ण जिम्मेदारी मेरी/हमारी होगी।
7. मेरे/हमारे द्वारा दी गई जानकारी असत्य पाए जाने पर मुझे/हमें एवं हमारी फर्म को निविदा में भाग लेने से वंचित किया जा सकता है।
8. उपरोक्त बिन्दुओं की जानकारी गलत पाये जाने अथवा टेण्डर के नियमों का पालन नहीं करने पर हमारी फर्म को **BLACK LIST** किया जा सकता है। जिसकी सम्पूर्ण जिम्मेदारी मेरी/हमारी होगी।

दिनांक

हस्ताक्षर
 नाम
 धारित पद
 फर्म का नाम
 (सील सहित)


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List and Specification of Equipments for Mechanical Engineering

Branch: - Mechanical Engineering

Name of the Laboratory:- Strength of Materials Lab

S. No.	Name of the Equipment to be procured	Specification
1	Rockwell hardness testing machine	<ul style="list-style-type: none"> → 1. Hardness scale <ul style="list-style-type: none"> • HRA,HRB,HRC,HRO,HRF,HRG (With standard indenters) • HRE,HRH,HRK (With optional indenters) → 2. 98 N Preliminary test course with manual test force stage elevation 588 N ,980 N,1471N → 3. Manual load control with 0.1 HR resolution output wireless and USB → 4. Maximum work piece height 170MM → 5. Maximum work piece depth 165MM from the center of indenter. → 6. Built in rechargeable battery <p>with all standard accessories, tools and spares to perform all basic operations</p>
2	Izod Charpy impact testing Machine	<ul style="list-style-type: none"> → Pendulum drop angle of 140 degrees for charpy test and 90 degrees for Izod test → Striking velocity of the pendulum is 3.857 m/s for izod test and 2.45 m/s for charpy test. → Maximum permissible loss by friction 0.50 % of impact energy → Pendulum effective weight of 21.300 kg for izod test and 21.400 kg for charpy test <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>

Branch: - Mechanical Engineering

Name of the Laboratory:- Thermal Engg. Lab

S. No.	Name of the Equipment to be procured	Specification
1	Model of Carburetor	<ul style="list-style-type: none"> → Made of Steel → All the parts are clearly visible and labeled with suitable platform
2	Model of fuel injector	<ul style="list-style-type: none"> → made of stainless steel → All the parts are clearly visible and labeled with suitable platform
3	Model of fuel pump	<ul style="list-style-type: none"> → made of stainless steel → All the parts are clearly visible and labeled with suitable platform


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Branch: - Mechanical Engineering

Name of the Laboratory:- Workshop Practice Lab

S. No.	Name of the Equipment to be procured	Specification
1	Shaper Machine	→ Shaping Machine 450 MM stroke (Motorized) with all attachments, tools and testing broacher
2	Shaper Machine	→ Shaping Machine 350 MM Stroke (Hydraulic) with all attachments, tools and testing broacher
3	Milling Machine	→ Milling Machine Universal horizontal table lenght X width 1350X310MM Motorized with all attachments as - → Universal head → vertical head → Slotting attachment → Rack cutting attachment → rotary table → Dividing head → Adapter, arbors and collects etc. for straight shank and mill from 3MM to 30MM with all standard accessories, tools to perform all basic operations and testing broacher
4	Machine Shop Heavy Duty Lathe Machine (Gear drive head stock)	→ Width: 510mm → Centre Height: 450mm → Admit between Centers: 1000mm → Main Drive Motor: 7.5 HP → Volt.: 110-440V → Lathe Machine Type: Horizontal Lathe → Variable speed ranges Drive → Coolant tank with complete pump capacity - 10-14 Ltrs → Normal Chuck diameter - 160mm → Drive plate as per spindle dia 160mm -1no. → Four Jaw independent chuck with marking block dia 160mm -1no. → Three Jaw self-centering chuck dia 160mm - 1no. → Revolving Centre - 1 no. → Quick-change tool post - 2nos. → Machine Lamp - 1no. → Tools sets - 1 set → Tools Kit- 1 set with all standard accessories, tools to perform all basic operations and testing broacher


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List and specification of Equipments for Electrical Engineering

Branch: - Electrical Engineering

Name of the Laboratory:- Basic electronics

S. No.	Name of the Equipment to be procured	Specification
1	Discrete Component Trainer Kit for - PNP & NPN Transistor, Rectifiers and Filters Trainer, Thevenins And Nortan Theorem Trainer.	<p>For PNP & NPN Transistor,</p> <ul style="list-style-type: none"> → Complete Kit with the following built-in components. → Built-in two Digital Meters to read Voltage & Current (i.e 2V, 20V, 200mA & 200mA). → Built-in variable stabilized power supplies 0-1V & 0-10V → Banana sockets are provided for students to make connections themselves. → Supplied with 10nos. safety leads with banana plugs → Stability $\pm 5\%$ <p>→ For Rectifiers and Filters Trainer,</p> <p>Consist of</p> <ul style="list-style-type: none"> → half wave rectifier → full wave rectifier <ol style="list-style-type: none"> 1. centre tapped rectifier 2. bridge rectifier <p>Features:</p> <ul style="list-style-type: none"> → Easy to operate → Longer serving life → Robust construction <p>Other Details:</p> <ul style="list-style-type: none"> → Completely self contained stand-alone unit. → Demonstrates the principle and working of different rectifier circuits such as half wave, full wave, and bridge and effect of different filter circuits on its output. → Supply required 230v, 50hz ac. → Built-in step down centre tapped transformer. → Built-in bank of rectifying diodes, capacitors, resistors and coils. → Demonstrates the different characteristics of various rectifying circuits with and without filters. → Determination of ripple factor for all filters circuits. → Multi-coloured test points at various stages in the circuit to observe the waveforms and voltages. → Set of patch cords. → Housed in an elegant metal cabinet with a well spread intelligently designed circuit layout on the front panel. → Strongly supported by a comprehensive instruction manual complete with theory and operation details. → Different filter circuits like capacitors filter, inductance filter, I section filter and pi filter. <p>For Thevenins And Nortan Theorem Trainer Hardware specifications:</p> <ul style="list-style-type: none"> → dc variable power supply 2 to 12 v/350 mA resistor networks. → variable current sour load resistor → set of patch chords (including stackable) & manual <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>


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Branch: - Electrical Engineering

Name of the Laboratory:- Digital electronics

S. No.	Name of the Equipment to be procured	Specification
1	Digital IC trainer kit (for laboratory)	Usage -laboratory . → input-230 v → frequency-50Hz → fixed DC power+ \pm 5v/500mA supply → for performing all basic gates NOT, AND, OR, NAND, NOR, EX-OR, EX-NOR gates etc. with all standard accessories, tools to perform all basic operations and testing broacher

Branch: - Electrical Engineering

Name of the Laboratory:- Electrical circuit

S. No.	Name of the Equipment to be procured	Specification
1	CRO	cathode ray oscilloscope → dual channel → usage – laboratory → ac power supply 230 \pm 10V → high performance\ price ratio → band with DC20Mhz(-3db), y deflection :- 5mv/div-10v/div, → rise time :-<18ns, mag-70ns::17.5ns → sweep mode :-auto , trig, lock signal sweep rate :_0.1micro sec/div-0.2s/div. with all standard accessories, tools to perform all basic operations and testing broacher
2	Series and parallel RLC trainer kit	→ variable R,L,C → resonances condition would possible → usage laboratory experiment → consist of voltmeter-0-230V → ammeter(0-30A) → should show power factor → digital display with all standard accessories, tools to perform all basic operations and testing broacher
3	Thevenins And Nortan Theorem Trainer Kit	Hardware specifications: → dc variable power supply 2 to 12 v/350 mA resistor networks. → variable current sour load resistor → set of patch chords (including stackable) & manual with all standard accessories, tools to perform all basic operations and testing broacher

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Branch: - Electrical Engineering

Name of the Laboratory:- Electrical installation maintenance and testing

S. No.	Name of the Equipment to be procured	Specification
1	Insulation oil testing kit	<ul style="list-style-type: none"> → oil BDV test set → oil test set is ideal for speedy and accurate testing of breakdown /withstand test of transformer and CB oil in accordance with ISI6792:1992 for oil testing → input 230V +\ -10V → 50Hz ,1 phase → Output -continuously variable for 0 to 50KV AC with center point of HV winding is grounded. → Duty intermittent with oil sample <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>
2	Earth resistance testing kit	<ul style="list-style-type: none"> → AET dual Range (0-10-100ohms analogues display, hand driven , metal ,body, four terminal earth resistance tester) with all arrangement <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>

Branch: - Electrical Engineering

Name of the Laboratory:- Electrical Machine Lab

S. No.	Name of the Equipment to be procured	Specification
1	Dc series motor experimental setup	<ul style="list-style-type: none"> → 2.3KW → with loading arrangement → with all its accessories → with its starting arrangement 2 point starter <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>
2	Ac to DC MG set	<ul style="list-style-type: none"> → Frequency 50Hz → Frame material – mild steel → Voltage 220V → Automation grade – semi automatic → 4 pol SPDP Machine <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>
3	Dc separately excited generator/motor experimental setup	<ul style="list-style-type: none"> → 1.6kw → easy to study the characteristics → to study the performance of machine with all its accessories and starting arrangement. <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>
4	Single Phase and Three Phase Transformer Trainer	<p>Usage laboratory</p> <p>Specifications:</p> <p>Single Phase Transformer - 2 Nos.</p> <ul style="list-style-type: none"> → Construction: Double wound iron core EI step down transformer → Primary: 0 - 115 - 200 - 230 V AC, 1.3 A, 50 Hz, brought out on 2 x 2 sockets

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		<ul style="list-style-type: none"> → Construction: Iron core strip lamination type step down → Primary: 3 Nos. isolated primaries, 0 - 415 V, 0.24 A, 50 Hz, brought out on 3 x 3 sockets → Secondary: 3 Nos. isolated winding groups, main 110 V, 0.5 A, zigzag 110 V, 0.5 A, tertiary 220 V, 0.25 A <p>List of panels:</p> <ul style="list-style-type: none"> → Input Three Phase DOL Starter Panel → Digital Multi Function Measurement Panel - Three Phase → Digital Multi Function Measurement Panel - Single Phase → FWD-OFF-REV Switch Panel → Single Phase Input MCB Panel → Secondary Side AC Voltmeter Panel → Dual Range Secondary Side AC Ammeter Panel → Milliohmmeter (V-I Method) → Resistive Load Panel → Lamp Load <p>Three Phase Dimmer - 1 No.</p> <ul style="list-style-type: none"> → Experiments: More than 25 experiments including → Finding transformer equivalent circuit → Study of transformer regulation → Measurement of winding temperature → Effect of type of load on transformer output waveform → Three phase transformer connections → Equivalent circuit of 3 winding transformer → Scott connection: Using 2 nos. of 1 phase transformer 3 phase to 2 phase conversion → Parallel operation of 1 phase transformer → Effect of variety of 3 phase connections on regulation and current carrying capacity of transformers → Harmonic cancellation and shift in phaser diagram due to different connections → Working of Teaser transformer → Back to back (Sumpner Test) on two identical 1 phase transformers <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>
5	Dc Shunt Motor Experimenta I Setup	<p>Experiments with Setup:</p> <ul style="list-style-type: none"> → Study of Operational Working and Principle of DC Shunt Motor → Study of running and reversing phenomenon of DC Shunt Motor → Study of No Load Characteristic of DC Shunt Motor → Study of Load Characteristic of DC Shunt Motor → Study of speed control of DC Shunt Motor using armature voltage control and flux field control method → Study and Determine the losses of DC Machine and correspondingly calculate the efficiency of DC Machine by Swinburn's Test Method <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>
6	Motor generator set (DC to AC)	<p>Technical Specification:</p> <p>MOTOR</p> <ul style="list-style-type: none"> → 5 H.P., 440 Volts → 4 Poles 1500 R.P.M., → S.P.D.P. 1 Type → Continuous Rating Class of Insulation 'F'. Horizontal Foot Mounted, Dynamically Balanced → All The Terminals Are Brought Out To Terminal Box. → Confirming To Provide Lifting Bolt & Earthling Terminal <p>ALTERNATOR :</p> <ul style="list-style-type: none"> → K.V.A.,415/240 Volts, 50Hz, 3 Phase 4 Wires 0.8 P.F.1500 R.P.M.,S.P.D.P. → Type Continuous Rating with Self Static Field Exciter, Self-Regulation, and Insulation Class 'H'Frame Size 160, Horizontal Foot Mounting Confirming To Alternator Is Provided Lifting Bolt &Earthling Terminal. <p>CONTROL PANEL:</p> <ul style="list-style-type: none"> → The Box type Instrument Panel above the working area and of size W = 900 mm ; D = 250 mm ; H= 750 mm & Front side of 6mm thick bakelite sheet of brown colour and fitted at inside of the tube structure. → All other sides made of MS sheet, two sides of the panel are to be perforated for air ventilation. → Back side in the form of hinged door with suitable locking arrangement → Educational type back elite insulated banana terminals provided for supply and motor generator connection. → Circuit diagram of panel provided inside the panel.


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		<p>→ All accessories connected with internal wiring ferrules etc.</p> <p>D.C. SIDE</p> <p>→ Voltmeter M.C, Type 0-500 volts,96 x 96mm :</p> <p>→ Ammeter M.C.Type 0-15 Amp.96 x 96 mm Make Make :</p> <p>→ Field regulator 500 ohm,1.5 Amp. :</p> <p>→ Indicating lamp LED type Red, colour 12mm size.</p> <p>→ D.P.S.T. 20 Amp Knife Switch : 1 no.6) Three Point D.C. Motor Starter Suitable</p> <p>AC. SIDE.</p> <p>→ Voltmeter M.I, Type 0-500 volts,96 x 96 mm Make Make :</p> <p>→ Ammeter M.I.Type 0-15 Amp.96 x 96 mm Make Make :</p> <p>→ Ammeter M.C.Type 0-1.5 Amp.96 x 96 mm Make Make :</p> <p>→ Frequency meter 45-50-55 Hz. 96 x 96 mm Make Make</p> <p>→ : Rotary Switch for voltmeter select for OFF/R/Y/B/BR 16 Amp.,440 v :</p> <p>→ MCB 20 Amp, 3 Ph.440 volts7) Indicating lamp LED type R.Y.B .colour, 12mm size : 1 each8)</p> <p>→ Field regulator disc type suitable to decrease field current up to min.Amps :</p> <p>→ Field control separately excited unit suitable for above alternator should be mounted inside the panel board</p> <p>→ Ammeter Selector Switch, Rotary type, Off/R/Y/B, 16 A. 440 V. :</p> <p>→ 3 ph. Power Factor Meter, 5 Amp.,440V, 96x96mm : 1 no.All meters 96 x 96 mm size pannel mounted type maximum in accuracy</p> <p>→ BASE PLATE : Motor and Generator will be mounted on fabricated base plate of M.S.'C' channel size 75 x 40 x 6mm thick.</p> <p>→ COUPLING: Motor and Generator are coupled with a flexible coupling & mounted on a common base plate.Coupling guard & anti vibration mounts are also provided.</p> <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>
7	Single phase transformer trainer	<p>→ Basic concepts and functioning of a Single Phase Transformer.</p> <p>→ The Lab practically expertise you in exercises like Polarity, Turns Ratio, Transformation Ratio, Iron Loss, Copper Loss, Efficiency etc.</p> <p>→ The varied scope of learning makes the subject understanding complete. The setup is complete in all respect and requires no other apparatus</p> <p>→ Practical experience on this setup carries a great educative value for Science and Engineering students.</p> <p>→ Study of Open Circuit Test in a Single Phase Transformer</p> <p>→ Study of Short Circuit Test in a Single Phase Transformer</p> <p>→ Study of Load Test and correspondingly determine the Efficiency and Voltage Regulation in a Single Phase Transformer</p> <p>→ voltage ration and current ratio</p> <p>→ 1KVA 50HZ 230V Single Phase supply</p> <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>

Branch: - Electrical Engineering

Name of the Laboratory:- Electrical workshop

S. No.	Name of the Equipment to be procured	Specification
1	Panel board	<p>→ 3 phase supply</p> <p>→ phase changing device</p> <p>→ manually operated</p> <p>→ current 32 amp</p> <p>→ with mcbs</p> <p>→ elcbs</p> <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>
2	¼ Hp induction motor	<p>→ 1 phase ac supply</p> <p>→ 1000 rpm</p> <p>→ 230V AC</p> <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>
3	Room heater	<p>→ 1000W</p> <p>→ 230V AC</p> <p>→ 50Hz</p> <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>

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4	Food processor	<ul style="list-style-type: none"> → 1000W → 750V AC → 50Hz with all standard accessories, tools to perform all basic operations and testing broacher
5	Electric toaster	<ul style="list-style-type: none"> → 1000W → 850V AC → 50-60Hz with all standard accessories, tools to perform all basic operations and testing broacher

Branch: - Electrical Engineering

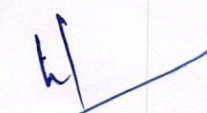
Name of the Laboratory:- Elements of Electrical Engg.

S. No.	Name of the Equipment to be procured	Specification
1	Demonstration trainer kit	<ul style="list-style-type: none"> → Demonstration of force experienced by a current carrying conductor placed in magnetic field . with all standard accessories, tools to perform all basic operations and testing broacher
2	¼ Hp induction motor	<ul style="list-style-type: none"> → single phase ac supply → 1000 rpm → 230V AC with all standard accessories, tools to perform all basic operations and testing broacher
3	Room heater	<ul style="list-style-type: none"> → 1000W → 230V AC → 50Hz with all standard accessories, tools to perform all basic operations and testing broacher
4	Food processor	<ul style="list-style-type: none"> → 1000W → 750V AC → 50Hz with all standard accessories, tools to perform all basic operations and testing broacher
5	Electric toaster	<ul style="list-style-type: none"> → 1000W → 850V AC → 50-60Hz with all standard accessories, tools to perform all basic operations and testing broacher

Branch: - Electrical Engineering

Name of the Laboratory:- Instrumentation & Control Lab.

S. No.	Name of the Equipment to be procured	Specification
1	Measurement of temperature using optical/radiation pyrometer optical/radiation pyrometer	<ul style="list-style-type: none"> → Accuracy +/- 0.3% to 2 % of measured value → range 0-3000° degree Celsius → detector type thermopile → response time 2 m sec -10 sec → power supply 24V DC → O/P- 4-50mA or USB /RS232/RS485 → features- Digital pyrometer with laser targeting with all standard accessories, tools to perform all basic operations and testing broacher


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Branch: - Electrical Engineering

Name of the Laboratory:- Power Electronics

S. No.	Name of the Equipment to be procured	Specification
1	Three Phase Fully Controlled Thyristorized Bridge Converter With Triggering Circuit.	<p>Object:</p> <ul style="list-style-type: none"> → To study the nature and generation of Control Signal for 3 phase Full-wave Controlled Rectifier. → To study the operation of a 3 phase Full-wave Controlled Bridge Rectifier with R load. → To study the operation of a 3 phase Full-wave Controlled Bridge Rectifier with R-L load. <p>Features:</p> <p>The board consists of the following built-in parts:</p> <ol style="list-style-type: none"> 01.) Three Phase line commutated fully-controlled thyristorized bridge converter. 02.) Three pole power contractor with AC coil complete with Push-to-ON switch. 03.) Four pole Miniature Circuit Breaker (MCB). <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>
2	Series Voltage & Shunt Voltage Regulator Trainer	<p>On panel 3 combinations of C, & R</p> <ul style="list-style-type: none"> → On panel circuit diagram for charging & discharging → SPDT switch for charge & discharge operation → Fixed power supply 9 V @ 500 mA → On panel 10 V digital meter → Required numbers of patch cords and operating manual. <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>
3	Speed control of 1 phase induction motor using triac trainer kit	<ul style="list-style-type: none"> → speed control of ac motor kit → isolation step down transformer 230/ 110V control circuit using triac BT137F → firing ckt using pulse transformer. → Universal motor <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>
4	Single phase servo stabilizer 5KVA	<p>single phase</p> <ul style="list-style-type: none"> → input voltage 155v-270V → freq 50Hz → control type micro controller → type digital → with surge protection → power 5 kva <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>
5	Traic characteristic apparatus	<p>For laboratory usage</p> <ul style="list-style-type: none"> → Frequency 50Hz → Frame material – mild steel → Voltage 220V → Automation grade – semi automatic → Instrument type– analog <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>

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Branch: - Electrical Engineering

Name of the Laboratory:- Switchgear And Protection Lab

S. No.	Name of the Equipment to be procured	Specification
1	Buchholz Relay Testing Kit	<p>→ Usage Laboratory, → Buchholz Relay Testing Kit Is Very Use Full For Training Purpose.</p> <p>Objective:</p> <p>→ For Studying Functional Performance of Buchholz Relay* For Graphical Plotting Characteristics of the relay.</p> <p>Technical Specification:•</p> <p>→ Nominal Pipe Bore : 25 mm• → Porosity Test : Withstood 3 Kg/cm² for 30 minutes. → High Voltage Test :Withstood 2000 V @ 50 Hz for 1 Minutes• → Element Test : Withstood 1.75 Kg/cm² for 15 Minute• → Gas Volume Test : Alarm operated at 160cc• → Trip operated at a steady Flow : 100 cm/ angle of mounting• → Loss of Oil Test :Trip operated when oil level is dropped to bottom of the inlet port.• → Surge Test : The Trip operated satisfaction on the application of a sudden pressure of 1.5 Kg./cm²• → Contact Rating : 230 V-5A, AC : 220 V-2A DC• → Insulation Resistance at Test Bed Temperature : Not less than 10 Mega ohm → Control Unit: Consisting of MCB DP Input Protection, Indicators for Alarm, Trip Mains. → Transformer Tank → Conservator Tank → Reservoir Tank → Valves Foot Pump. → Complete Experimental Setup will be mounted on heavy duty M.S Angle Iron frame. → Accessories: Instructional Manual, Patch Cords etc</p> <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>
2	Demo Kit of bimetallic overload relay:	<p>→ Consists of MCB contactor & bimetallic over load relay Mounted on powder coated metal Panel with all the connection are terminated on the top of the panel with BT115 Connectors. → The components can be viewed on the Panel and connector for motor connection.</p> <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>
3	ETAP SOFTWARE FOR ELECTRICAL POWER SYSTEM	<p>→ version -19.5 → Developer - Power system software and power management</p> <p>with all standard accessories, tools to perform all basic operations and testing broacher</p>


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List and specification of Equipments for Civil Engineering

Branch:- Civil Engineering

Name of the Laboratory :- Concrete Technology Lab

S. No.	Name of the Equipment to be procured	Specification
1	Sieve Sets fine & coarse aggregate	→ Conforming to IS:450:1962 of specification of 80mm, 40mm, 20mm, 10mm, 4.75mm, 12.5mm, 2.36mm, 1.18mm, 600micron, 300micron, 150micron, 75micron with all standard accessories, tools to perform all basic operations and testing broacher
2	Crushing value test mould for aggregate	→ Cast iron mould, temping rods → 160mmØ, 60cm long → Is sieve 12.5mm, 10mm, 2.36mm, → CI mould 11.5cmØ, 18cm height → plunger - 110mm dia and 100mm height → Base plate 200-220mm SQR X 7mm thick with all standard accessories, tools to perform all basic operations and testing broacher
3	Flakiness & elongation index gauge	→ material- stainless steel with all standard accessories, tools to perform all basic operations and testing broacher
4	Los angles	→ power source electronic → supply - AC → Drive power -415V → CI/steel ball - 48mmØ, 390 to 445g weight balance → Motor -3/4 HP with all standard accessories, tools to perform all basic operations and testing broacher
5	Fineness test of cement by sieving	→ IS sieving 90micron/sieve no.9 → standard balance weight machine with gauging trowe with all standard accessories, tools to perform all basic operations and testing broacher
6	compressive strength test mould of cement	→ mould size - 7.06cm -6nos vibration machine with all standard accessories, tools to perform all basic operations and testing broacher

Branch:- Civil Engineering

Name of the Laboratory :- Soil Mechanics Lab

S. No.	Name of the Equipment to be procured	Specification
1	Electric oven	→ Stainless steel hot air → Digital display → power supply 380 V → with Aluminum container and tray → Temperature change 50-250 Degree C → Capacity 25-50Kgs with all standard accessories, tools to perform all basic operations and testing broacher
2	Box shear test with dial gauge	→ shear box assembly test 60X60X25 mm thick loading unit with capacity of 8kg/cm2 → set of weight to give normal stress of 3kg/cm2 → Single phase AC supply → Least count 0.002mm

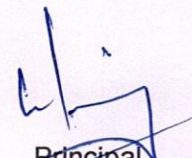
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		with all standard accessories, tools to perform all basic operations and testing broacher
3	Triaxial Test Vertical Clearance	<ul style="list-style-type: none"> → Capacity 50 KH → Dimension 1140x275x1260mm → Horizontal clearance 364mm X 910MM → power 320V → Specimen dia 38MM → weight 85 kg → Dial gauge 0.01mm X 25 mm for strain
		with all standard accessories, tools to perform all basic operations and testing broacher

Branch:- Civil Engineering

Name of the Laboratory :- Surveying Lab

S. No.	Name of the Equipment to be procured	Specification
1	Cross staff	<ul style="list-style-type: none"> → with stand rod → 4" 6" Brass
2	Peg	<ul style="list-style-type: none"> → 2.5cmSqr Height 30cm → Material wooden
3	Plumb Bob	<ul style="list-style-type: none"> → Material mild steel → thread - Cotton → Weight - 425-500g
4	Pentagraph	<ul style="list-style-type: none"> → 15.4x14.4 inch → material -Metal → foldable
5	Ghat Tracer	<ul style="list-style-type: none"> → Frequency 50HZ → Material- Steel → AC 220V power supply
6	Abney Level	<ul style="list-style-type: none"> → Radius 0-90 degree → Material- Aluminum and brass → circle Dia. 30MM
7	Climo meter	<ul style="list-style-type: none"> → Display type analog → Material - Brass → Size 3 inch
8	Digital Theodolite	<ul style="list-style-type: none"> → with stand and prism → Length of Telescope 156mm → Objective lance aperture 45mm → material- ABS → weight 5 KG → Battery type
9	Total Station	<ul style="list-style-type: none"> → magnification 30X → objective lens diameter-45Mm(EDM 50Mm) → resolving power 3" → minimum focusing distance P1.3m,1.3M → battery life -9 hrs → Telescope length 152mm → Disc dia. 79mm, image type Erect
with all standard accessories, tools to perform all basic operations and testing broacher		


 Principal,
 Government Polytechnic Mungeli
 Disitt - Mungeli, CG
 Govt. Polytechnic, Mungeli
 District-Mungeli, C.G.

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