

GOVERNMENT COLLEGE OF ENGINEERING
JAMUNALIA, OLD TOWN, KEONJHAR-758 002

No. 1930

Dated 01-12 -2018

TENDER CALL NOTICE

Sealed tenders are invited from reputed original manufacturers up to the date mentioned in the tenders for supply of equipment through speed post/registered post only for Department of Civil Engineering. The date of opening the tender is mentioned in the respective tender document, which will be opened in the office of the Principal, Government College of Engineering, Keonjhar in the presence of bidders and/or their nominees. The tender bid documents with details of terms and conditions are to be downloaded from the College Website: www.gcekr.ac.in.

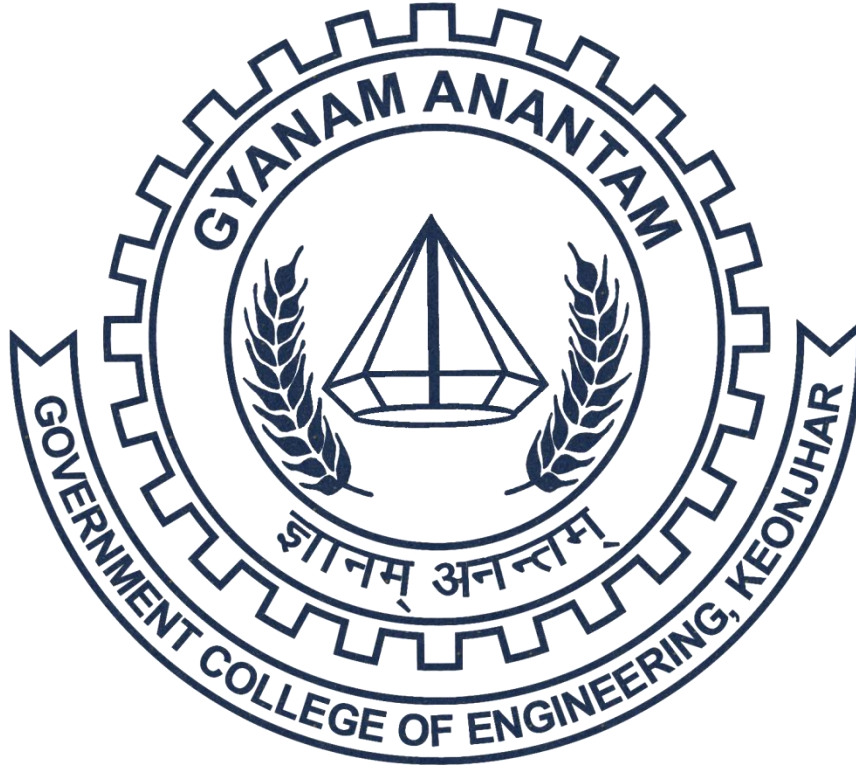
The authority reserves the right to reject/cancel the tenders in whole or in part without assigning any reason thereof. The authority will not be responsible for any postal delay.

Sd/-
Principal

Bid Ref No. 1930

Date: 01.12.2018

**BIDDING DOCUMENTS AND INSTRUCTION TO SUPPLY EQUIPMENT
FOR
ENVIRONMENTAL ENGG. LAB. OF DEPARTMENT OF CIVIL ENGINEERING**



GOVERNMENT COLLEGE OF ENGINEERING, KEONJHAR

[A Constituent College of Biju Patnaik University of Technology]

Jamunalia, Old Town, Keonjhar– 758 002

INVITATION FOR BIDS

Principal, Government College of Engineering, Keonjhar invites sealed bids from eligible bidders for supply of machineries/equipment to Department of Civil Engineering.

Interested eligible Bidders may obtain detail information and list of items with technical specifications from **the website of the College www.gcekjr.ac.in**

Particulars about submission of bidding document are as follows:

- (a) Price of bidding document (non-refundable) : **Rs.1000/**
- (b) First date of availability of Bidding Document in the website : 01.12.2018
- (c) Last date and time for submission of bids : **28.12.2018**
- (d) Time and date of opening technical bids : 03.01.2019, 11.00 AM
- (e) Time and date of opening of financial bid: will be notified in the college website after the scrutiny of the technical committee
- (f) Place of opening of bids : **Principal Office
Government College of Engineering
Jamunalia, Old Town,
Keonjhar-758002**
- (g) Address for communication : **Principal
Government College of Engineering
Jamunalia, Old Town,
Keonjhar-758002**

Sd/
Principal

1. Eligibility of Tenderer and General Instructions:

1.1 Eligibility:

Those who fulfill the following criteria are eligible to participate in the tender.

- a) The tenderer must be a reputed Original Equipment Manufacturer and/or the Authorised agent/ dealer of a reputed manufacturer. Manufacturers must provide all documents relating to their Manufacturing Capabilities.
- b) If the tenderer is an Authorized Dealer/Agent of a reputed manufacturer, necessary certificate to this effect from his manufacturer must be enclosed
- c) The tenderer must be registered with GST.
- d) Annual turn-over of the tenderer must be more than Rs. Two Crores each in last three years. As a letter of support the bidder should submit audited balance sheet of last three financial years.
- e) The tenderer must have cleared GST and Income Tax payment up to date. Attested copies of GST Clearance Certificate or non-assessment certificate from the concerned Sales Tax Authority valid up to date and attested copy of Income Tax Clearance Certificate or non-assessment certificate, as the case may be, from the competent authority, up to date and PAN Number must be enclosed along with the Tender documents.
- f) The tenderer must have the willingness for providing comprehensive maintenance support of the Machine supplied by him for at least two years after expiry of the warranty period.
- g) The tenderer must provide evidence of purchase order and successful execution of supply of orders with installation and successful after sales support in reputed organizations like NITs/IITs/IIESTs/IISERs/NISER/IISc/Central Research Laboratories/ Government Engineering Colleges of Odisha.
- h) The manufacturer should be preferably ISO: 9001-2008.
- i) The manufacturer should have preferably its own NABL (National Accreditation Board for Testing and Calibration Laboratories) accredited laboratory or equipments supplied should have certification from any NABL accredited laboratory in respect of quality and performance.
- j) The manufacturer should be preferably registered with ESI.
- k) The manufacturer should have preferably its own R&D section registered with Government of India.

1.2 General Instructions:

The selection for procurement of equipment will be based on quality and performance along with cost. In this context decision of technical committee is final based on documentary evidence or actual physical verification.

- a) Submission of more than one bid by a particular tenderer under different names is strictly prohibited. In case it is discovered later on that, this condition is violated, all the tenders submitted by such tenderer/s would be rejected or contract cancelled.
- b) The tenderer should mention in the tender paper, the location of its service centre nearest to Keonjhar.
- c) All offers should be in English and the price quoted for each item should be firm.

- d) Warranty period, Delivery period and After-Sale-Service conditions, etc. are also to be clearly indicated.
- e) The rates and the conditions of the offer will remain valid for three months from the date of opening of the tender and no change or alteration of the rate will be acceptable on any account.
- f) Submitted tender forms with overwriting or erased or illegible specifications and rates will be rejected.
- g) Request from tenderer in respect of additions, alterations, modifications, corrections, etc. of either terms & conditions or rate after opening of the bid may not be considered. However, negotiation may be made before finalization.
- h) Tenderers shall carefully examine the bid documents and fully inform themselves of all the conditions, which may in any way affect the work of the cost thereof.
- i) Should a tenderer find discrepancies or omissions from the specification or other documents and any doubt as to their meaning, he should at once notify the purchaser and obtain clarification in writing.
- j) This, however, does not entitle the tenderer to ask for time beyond the due date fixed for receipt of tenders.
- k) The tenderer must also specify minimum time and maximum time to repair/replace in the event of a failure and penalty thereof.
- l) Verbal clarification and/or information given by the purchaser or its employees or representatives shall not be binding on the purchaser.
- m) Submission of sealed bid will carry with the implication that the tenderer agrees to abide by the conditions laid down in the detailed particulars of the bid notice.
- n) Conditional offers and offers qualified by vague and indefinite expression, as 'subject to immediate acceptance' 'subject to prior sale', etc. will not be considered.
- o) While tenders are under consideration, tenderers and their representatives or other interested parties are advised to refrain from contacting by any means, to the purchaser's personnel or representatives on matter relating to the tenders under study.
- p) The purchaser, if necessary, will obtain clarification on tenders by requesting such information from any or all the tenderers either in writing or through personal contact as may be necessary.
- q) The tenderer will not be permitted to change the substance of his offer after the tenders have been opened.
- r) In the event of non-compliance with this provision, the tenderer is liable to be disqualified.

1.3 Procedure for Submission of Tenders:

The Tenderers must submit their bids as required in two parts in separate sealed covers prominently super scribed as Part-I "Technical Bid" and Part-II "Financial Bid" and also indicating on each of the covers the "Tender call Notice Number & Date" and due date and time of submission as mentioned in Tender Call Notice.

Part-I (Technical Bid)

Excepting the price schedule, all other documents as mentioned in para 1.1 i.e details of technical specifications, printed information Catalogue for each instrument, Copy of Firm Registration Certificate from the competent authorities, GST Registration, Income Tax Clearance, PAN Card copy, list of clients, evidence of successful execution with photograph, etc. along with tender document duly signed by the authorized person in each page shall be covered in Part-I (Technical Bid).

Part-II (Financial Bid)

All indications of price shall be given in Part-II (Financial Bid).

a) Both sealed covers Part-I “ **Technical Bid**” and Part-II “Financial Bid” should be placed in a third cover along with requisite **EMD & cost of Tender documents** (separately in the form of DD drawn in favour of **Principal, Government College of Engineering, Keonjhar** at any Nationalized Bank payable at Keonjhar) , others requisite supporting documents etc. and sealed. The sealed cover containing tender documents as per procedure indicated above should be sent to the Office of the Principal, GCE, Keonjhar by Registered Post/Speed Post only addressing to the Principal, Government College of Engineering, Jamunalia, Old Town, Keonjhar-758002 **within the due date and time as stipulated in Tender. The sealed envelope must show the name of the tenderer and his address and should be super scribed as “Tender for supply of Equipment for Environmental Engineering Lab for Civil Engineering Department” on the top of the envelope.**

b) All the documents submitted must be in the papers showing signature of the tenderer and printed office name of the tenderer on official seal.

c) All the documents must be submitted in a sequential manner with separator/flags to help in quick scanning of the topics. Wherever possible, data in tabular form should be given.

2. Requirements by Tenderer before Supply:

2.1 Rating Plate, Name Plate and Labels:

Each of the equipment is to have permanently attached to it, a rating plate of non-corrosive material in a conspicuous position, upon which the total specifications along with the manufacturer’s name, address, etc. are to be engraved.

2.2 Packaging:

All the equipment are to be suitably protected, covered in water -proof packing and crated to prevent damage or deterioration during transit and storage till the time of installation. The supplier shall be responsible for any loss or damage caused during transportation, handling or storage till their successful installation.

2.3. Inspection:

- a) All materials / equipment shall be inspected and tested for completeness, proper assembly, operation, cleanliness and state of physical condition and performance as per quoted specification.
- b) The test shall be conducted, reported and certifications to be provided by the tenderer.
- c) The tenderer shall provide all test and measuring equipment/tools required for inspection / testing.
- d) The cost of all such tests shall be borne by the Tenderer.
- e) GCE reserves the right to reject any equipment if it does not comply with the specifications during site testing, installation and commissioning stage.
- f) Inspection & testing would be conducted, jointly, at various stages as applicable during unpacking, installation and commissioning of respective equipment / components at the manufacturing site.

2.4. Environmental Condition:

All the equipment supplied shall be rugged and should operate without any deviation in quality, or degradation of equipment performance. All the specification/parameters shall be guaranteed over the following environmental conditions:

- * Storage Temperature : 0 to 50⁰ C
- * Operating Temperature : 0 to 50⁰ C
- * Humidity : 95% RH (non-condensing)

All the equipment are intended to operate under 220 V/ 440V, 50 Hz power supply.

3. Requirements by Tender after Supply:

3.1 Supply:

- a) The material would be delivered by the supplier at GCE, Jamunalia, Old Town, Keonjhar – 758002, Odisha.
- b) The items should be supplied directly from the manufacturing terminal having passed all tests successfully with Certifications as required.
- c) The equipment should conform to the latest relevant National/International standards and shall be completed in all respect.
- d) Any component, fitting etc. which may not have been specifically mentioned in the specifications but which are usual and necessary for the equipment, shall be supplied by the tenderer at no extra cost.

- e) In case, articles are found damaged in transit or found short at the time of delivery the full cost of the same will be deducted from the bill of the supplier in case the supplier does not replace the stock within a week from the date of the complain.
- f) The articles ordered must be supplied in one lot within 4 (four) weeks of placing of the order.
- g) In case of delay in delivery or successful installation, a penalty of 1% (one per cent) per week shall be levied.
- h) GCE reserves the right to procure the materials from alternative sources at the risk and cost of the successful tenderer giving 15 days notice.
- i) Any increase in tax and duties after expiry of delivery period will be borne by the supplier.
- j) In case the items supplied by the supplier are found not up to the specification shall be rejected.
- k) The supplier will be intimated to take back the stocks at his own cost within three days from the date of rejection and to replace the same within 7 days, failing which the EMD will be invoked in addition to taking legal actions.
- l) Imported consignment, if any, should be destined to GCE, Jamunalia, Old Town, Keonjhar – 758002, Odisha, India through Bhubaneswar Air Port.
- m) The suppliers shall be responsible for releasing the consignments from the carriers/transporters.
- n) The equipment shall be delivered and installed at site at the cost of the tenderer.
- o) All taxes, levies, surcharges including the customs clearance and handling freight and insurance should be paid and handled by the tenderer.

3.2 Installation and Commissioning:

Installation and Commissioning shall include the following:

- a) Installation and Testing of the Equipment, Machineries etc. must be conducted by the tenderer at GCE.
- b) It will be the responsibility of the tenderer to provide all necessary spares and consumables, which may be required during installation and commissioning, at no extra cost to purchaser.
- c) The tenderer is to bring their own testing and measuring instruments required for installation, testing, commissioning, which can be taken back after completion.
- d) Installation must complete within 15 days after delivery on site.
- e) During installation and commissioning the complete intended experiments is to be conducted with results must be within accepted level of accuracy.
- f) The raw materials and samples required for conducting experiments during installation is to be supplied by the tenderer free of cost.

3.3 Documentation:

- a) Detailed technical manuals, handbooks, drawings, Warranty card and Factory Quality Assurance checklist, test results and any other certifications mentioned in the Technical specifications shall be supplied along with the consignment.
- b) Supplied manuals/handbooks must cover detailed technical specifications and installation, operation, maintenance and System Safety procedures.
- c) For Experimental setups details of theory, procedure and methods of taking measurements etc. should be provided in the form of hand books for each experiment.
- d) The receipts for taxes paid, if any, for the supplied materials should also be submitted.

3.4 Trial Operation and Performance Guarantee Test:

- a) After successful completion of Installation and Commissioning of the equipment, a 7-day continuous trial operation putting those on optimum use shall be conducted by the tenderer at site, during which the performance of the equipment shall be demonstrated for trouble-free continuous operation, meeting the specified standards and proper training shall be imparted to two persons of the purchaser.
- b) During trial operation, tenderer shall do all necessary adjustments required to ensure the performance as per the acceptable level.
- c) In case, guaranteed performance is not established, the tenderer shall be given opportunity to rectify/replace the equipment/components, and restart the 7 days continuous trial operation, at the risk and cost of the tenderer.

3.5 On-Site Warranty:

- a) The entire materials may be used continuously. The reliability and safety of the total installed system and trouble-free operation are, therefore, of prime importance. The supplied devices/equipment and components shall be covered under **Two-years or more** comprehensive on-site warranty from the date of issue of successful completion of Performance Guarantee Report.
- b) During the period of warranty, it shall be the responsibility of the tenderer to provide all essential spares and consumables, which may be required for maintenance and trouble-free operation of the devices / components at the tenderer's cost.
- c) Software, if any, has to be tested with at least one-year warranty for trouble free operation.

3.6 Comprehensive Maintenance Contract:

- a) The tenderer shall be under the obligation of entering into a Comprehensive Maintenance Contract (CMC) with GCE for a minimum period of two years, renewable if felt necessary, on mutually acceptable rates, terms and conditions. CMC shall start after the completion of Warranty.

- b) The scope of CMC shall cover maintenance and supply/replacement of materials and components, for smooth and reliable operation of the systems without trouble.
- c) Accordingly, the tenderer has to offer rates for the CMC structure per equipment along with the price for the Systems and other associated Equipment supplied.

3.7 After Sales Service:

- a) During the warranty period and subsequently, after signing of Agreement for CMC the tenderer shall attend to the problems reported by the users of GCE on a priority basis.
- b) For any problem reported the tenderer shall attend and rectify the problem within 7 (seven) days or provide a standby system of the similar configuration.
- c) The report on any problem will be informed through phone or fax number of which shall be given by the tenderer.
- d) The branch office of the concerned manufacturing firm will be fully responsible to provide maintenance service, in case of any negligence, in providing the service by the tenderer.
- e) On failure to comply with those instructions, the Bank Guarantee provided for the warranty period shall be invoked.

4. Financial Terms:

4.1 EMD

- a) The tenderer has to submit a Demand Draft / Banker's Cheque / Pay order of Rs.20000/- **in favour of Principal, Government College of Engineering, Keonjhar** payable at Keonjhar in any Nationalized Bank towards EMD.
- b) There will be no interest paid to the tenderer towards EMD money.
- c) In no case, the EMD Money in cash or other forms will be accepted at the time of opening of the bid.
- d) No request for adjustment of claims, if any, will be accepted.
- e) The EMD of unsuccessful tenderers will be refunded as soon as possible after the tenders are finalized.

4.2 Performance Security Deposit

In case of successful Bidder EMD will be kept as Performance Security Deposit and will be refunded after expiry of stipulated warranty periods from the completion date of installation and commissioning on satisfactory performance of the equipment.

4.3 PRICES:

Price quoted should be **FOR Government College of Engineering, Keonjhar only. Tax components as applicable should be mentioned clearly in the financial bid.**

- a) Price should be quoted for unit item.
- b) Purchase order will be placed as a single lot for each type of item or for all the items together, as the case may be.
- c) In case of items of import, the tenderer should take full responsibility for customs clearance, handling, tax payment, etc. and specify the charge for the same in the price bid.

4.4 Sales Tax Concession:

Central Sales Tax Concession is to be availed on production of the required certificates applicable to Educational Institution.

4.5 Discount:

- a) Our Institute is a pioneer Institution in the field of Teaching and Research in Engineering and allied disciplines and do not run with profit motive.
- b) As such we are availing price discount for purchase of equipment/instruments.
- c) The rate of discount or any other Institutional benefit arising out of Govt. Policy etc., on each item may also be indicated in the bid specifically.

4.6 Payments:

- a) In case of imported items, payment will be made by opening LC in the name of the manufacturer subject to the condition that a Bank Guaranty for an equal amount will be submitted by the selected tenderer to GCE for the period of completion of installation and commissioning.
- b) In case of purchase in Indian Rupees, payment of 90 percent of the ordered value will be made after successful installation and commissioning of the equipment subject to submission of satisfactory performance report by the concerned Head of Department. The rest 10 percent of the payment will be made after one year of successful installation of the equipment.

4.7 Rate Contract with DGS&D or any other Government Organisation:

In case the tenderer has entered into a Rate Contract with DGS & D or any other Government Organization such as EPM, rate contract preference, number & copy of rate contract have to be submitted along with tender.

5. Instruction to the Tenderer:

- a) Some of the minimum specifications specified may be redundant, obsolete or incompatible and in these cases, quote the particulars of correct specification of latest trend and technology.
- b) Higher specifications instead of minimum specifications are allowed if a minimum specification is not available, obsolete or incompatible.
- c) Otherwise, model with higher specification should be in addition to the model with minimum specifications.
- d) Specify brand name and full model name and number for each offer.
- e) Include the printed catalogue and pricelist if any for each of the equipment quoted.
- f) Specify the list of Accessories required along with each of the equipment.
- g) Quote the additional price of the accessories; only those, which are fully compatible with the quoted model, should be furnished.
- h) Specify the list of Accessories to be given free of cost, along with the equipment as “**Free Accessories**”; these should be fully compatible with the quoted models.

5.1 Solving Disputes:

- a) GCE, the tenderer and the manufacturer shall make all efforts to resolve amicably by direct informal negotiation on any disagreement or dispute arising between them under or in connection with this contract.
- b) All disputes arising out of the contract shall be referred to courts under the jurisdiction of the Keonjhar court only.
- c) **The above terms and conditions except those otherwise agreed upon, shall form a part of the Purchase Order.**
- d) **Sign on each page of this tender document and Return it along with the offer enclosing this part together with the Technical Offer.**
- e) **The GCE authority has all rights to accept / reject any tender without assigning any reasons thereof.**

6. Technical Specifications:

Following are the minimum specifications of the equipment.

- a) The minimum specifications are indicative and not exhaustive.
- b) The models with higher specifications may be quoted.
- c) The quoted materials should be of latest trend and technology.
- d) Each equipment should be complete in itself without needing any extra requirements except the requirement of general test and measuring instruments.

List of equipment with technical specifications required for Civil Engineering Department:

Sl No.	Equipment	Specification
A1	Turbidity Meter IS 3025 (Part- 10)	It Should have the provisions to check last calibration points, time and date. Up to 200 measuring data can be stored and can be transferred to a pc via USB. It should have up to four-point calibration, a battery % indicator on startup and user friendly backlit display. It must be supplied with sample cuvettes and caps (5), calibration cuvettes, silicone oil, cuvette wiping cloth, batteries and AC adapter.
1	Range	0.00 to 1000NTU
2	Resolution	0.01 (0.00 to 9.99 NTU); 0.1 (10.0 to 9.99 NTU); 1 (100 to 1000 NTU)
3	Accuracy	±2% of reading + 0.02 NTU
4	Repeatability	±1 % of reading or 0.02 NTU, whichever is greater
5	Stray Light	<0.02 NTU
6	Light Detector	Silicon photocell
7	Light Source	Tungsten filament lamp
8	Lamp life	Greater than 100,000 reading
9	Measuring mode	Normal, average, continuous
10	Turbidity standards	< 0.1, 15, 100 and 750 NTU
11	Power supply	1.5V AA alkaline batteries (4) or AC adapter; auto-off after 15 minutes of non-use
12	Reagents	Reagents must be provided for 100 experiments.
B1	TDS Meter IS 3025 (Part 16 & 17)	Water proof, one point calibration, must be designed for drinking water and waste water application. All three ranges of measurements can be executed at the touch of a button, without having to change the conductivity probe. Potentiometric probe must be made of rugged PVC.
1	Range	0.0 to 199.9 mg/L (ppm); 0 to 1999mg/L (ppm); 0.00 to 19.99 g/L (ppt)
2	Solution	0.1 mg/L (ppm); 1 mg/L (ppm); 0.01g/L (ppt)
3	Accuracy	± 1 % F.S. (excluding probe error)
4	Calibration	Manual. one point through TDS knob
5	Temperature Compensation	Manual from 0 to 50 ⁰ C with $\beta = 2\% / ^{0}$ C
6	TDS Factor	0.5

7	Probe	Four ring conductivity probe with DIN connector and 1m cable.
8	Battery Type/Life	9W approximately 100 hours of continuous use
9	Environment	0 to 50 ⁰ C ; RH max 100%
10	Calibration Solution	Calibration solution must be provided for 100 experiments.
C1	COD Meter and Multipara meter Photometer	In addition to COD, this meter can be used to measures following listed water quality parameters using liquid or powder reagents. Can be connected to a PC via USB cable, must have compatible Software for managing experimental data. Must be supplied with glass cuvettes with caps (40), cell protective cap, batteries, 12V DC adapter, Sample preparation kit, cloth for wiping cuvettes, 60 ml glass bottle for DO analysis, scissors.
1	Light Source	Tungsten lamps with narrow band interference filters
2	Light Detector	Silicon photocell
3	Environment	0 to 50 ⁰ C ; RH max 90% non- condensing
4	Power supply	External 12V DC power adapter or built in rechargeable battery
a	COD test IS 3025 (Part 58)	
	Range	0 to 15000mg/L
	Reagent	Required reagent must be suppliedfor CODLR, CODMR and COD HR tests and for 100 lab experiments.
b	Alkalinity test	
	Range	0 to 500 mg/L (ppm) as CaCO ₃
	Reagent	Required reagent must be supplied for 100 lab experiments.
c	Iron test	
	Range	0.00 to 5.00 mg/L
	Reagent	Required reagent must be supplied for Iron LR and IronHR tests and for 100 lab experiments.
d	Fluoride test	
	Range	0.00 to 2.00 mg/L
	Reagent	Required reagent must be supplied for 100 lab experiments.
e	Sulphate test IS 3025 (Part 24)	
	Range	0 to 150 mg/L
	Reagent	Required reagent must be supplied for 100 lab

		experiments.
f	Ammonia	
	Range	0.00 to 10.00 mg/L
	Reagent	Required reagent must be supplied for AmmoniaLR and Ammonia MR tests and for 100 lab experiments.
g	Chlorides	
	Range	0.00 to 3.50 mg/L
	Reagents	Required reagent must be supplied for Chlorine Dioxide, Free Chlorine and Total Chlorine tests and for 100 lab experiments.
h	Hardness IS 3025 (Part-21)	
	Range	0.00 to 2.70 mg/L
	Reagents	Required reagent must be supplied for Calcium Hardness and Magnesium Hardness tests and for 100 lab experiments.
i	Nitrates	
	Range	0.0 to 30.0 mg/L
	Reagents	Required reagent must be supplied for 100 lab experiments.
j	Residual Chlorine	
	Range	0.01 to 1 mg/L
	Reagents	Required reagent must be supplied for 100 lab experiments.
k	Nitrogen	
	Range	0.00 to 50 mg/L
	Reagen	Required reagent must be supplied for 100 lab experiments.
D1	Hardness test Photometer IS 3025 (Part-21)	It must enables users to check validity of calibration, alerts the user of low battery power,can measure total hardness in drinking, surface and wastewater, should have an exclusive positive locking system to ensure that the cuvette is in thew same position every time it is placed into the measurement cell, must fit cuvettes with a larger neck. It should be supplied with sample cuvettes (4) with caps, 9V battery, instrument quality certificate and instruction manual.
1	Light source	Light emitting diod
2	Light detector	Silicon photocell with narrow band width interference filter
3	Power supply	9V battery
4	Auto- off	After ten minutes of non-use in measurement

		mode; after one hour of non- use in calibration mode; with last reading reminder
5	Environment	0 to 50 ⁰ C ; Relative humidity max 95% non-condensing
6	Method	Should follow corresponding Indian standards.
a	Hardness LR	
1	Range	0 to 250 mg/L (ppm)
2	Resolution	1 mg/L from 0 to 100 mg/L, 5 mg/L from 100 to 250 mg/L
3	Accuracy	± 5 mg/L ±4% of reading
4	Reagents / Solution	Required reagents must be supplied for 100 tests.
b	Hardness MR	
1	Range	200 to 500 mg/L (ppm)
2	Resolution	1mg/L from 0-100, 5 mg/L from 100-750
3	Accuracy	±7 mg/L, ±3% of reading
4	Reagents/ solution	Required reagents must be supplied for 100 experiments
c	Hardness HR	
1	Range	400 to 750 mg/L (ppm)
2	Resolution	5 mg/L
3	Accuracy	±10 mg/L, ±2% of reading
4	Reagents/Solution	Required reagents must be supplied for 100 experiments.
E1	Chlorine portable photometer IS 3025 (Part-26)	It should enable users to check validity of calibration, alerts the user of low battery power that could adversely affect reading,must have an exclusive positive-locking system to ensure that the cuvette is in the same place every time it is placed into measurement cell. Must be supplied with Photometer, check standards, sample cuvettes (4), with caps, 9V battery, scissors, cuvette cleaning cloth, instrument quality certificate, instruction manual and rigid carrying case.
1	Range	0.00 to 5.00 mg/L (ppm)
2	Resolution	0.01 mg/L from 0.00 to 3.50 mg/l (ppm); 0.10 mg/L above 3.50 mg/L (ppm)
3	Accuracy @ 25 ⁰ C	±0.03 mg/L ±3% of reading
4	Light source	Tungsten lamp
5	Light Decteor	Silicon photocell with narrow band interference filter @525nm
6	Power supply	9V battery
7	Auto-off	After ten minutes of non use in measurement mode3;after one hour of non- use in calibration

		mode ; with last reading reminder
8	Environment	0 to 50 ⁰ C ; RH max 95% non- condensing
9	Reagents	Reagents must be supplied for test of Chlorides and residual chlorine of water and for 100 tests.
F1	Dissolved Oxygen and temperature measurement meter IS 3025 (Part-38)	It must alerts the users for low battery power, must have one point or two point calibration, on screen tutorial messages, water resistant. It must allow users for altitude compensation and compensatyes for changes in solubility of oxygen in water and for permeability of the membrane from the effects of temperature, and must have removable protective membrane cover.Must be supplied with suitable probe with 4m. Cable, suitable membranes (2) , required electrolyte solution (100 ml), batteries, instructions and rugged carrying case.
a	Temperature measurement	
1	Range	0.0 to 150 ⁰ C
2	Resolution	0.1 ⁰ C ; 0.1 ⁰ F
3	Accuracy (@25 ⁰ C)	± 0.2 ⁰ C; ± 0.4 ⁰ F (excluding probe error)
b	Dissolved Oxygen measurement	
1	Range	0.00 to 45.00 mg/L (ppm); 0.0 to 300.0 % saturation
2	Resolution	0.01 mg/L (ppm); 0.1% saturation
3	Accuracy	± 1.5 % F.S.
4	Dissolved Oxygen calibration	One or two points at 0% and 100% in air
5	Temperature compensation	Automatic from 0 to 50 ⁰ C
6	Altitude compensation	0 to 4000 m (resolution 100 m.)
7	Salinity Compensation	0 to 80 g/L (ppt) (resolution 1g/L)
8	Probe	Polarographic DO probe, internal temperature sensor, DIN connector and 2m. Cable (included)
9	Battery type/ Life	1.5V (3) /approximately 200 hours of continuous use without backlight (50 hours with backlight on)
10	Reagents/ Solutions	Required reagents or solutions must be supplied for 100 lab test.
11	Environment	0 to 50 ⁰ C ; Relative humidity max 95%.
G1	Nitrate Potable photometer	It should enable users to check validity of calibratiobn, alerts the user of low battery power that could adversely affect reading, must have an

		exclusive positive-locking system to ensure that the cuvette is in the same place every time it is placed into measurement cell. Must be supplied with Photometer, check standards, sample cuvettes (4), with caps, 9V battery, scissors, cuvette cleaning cloth, instrument quality certificate, instruction manual and rigid carrying case.
1	Range	0 to 100 mg/L (ppm)
2	Resolution	1 mg/L
3	Accuracy @ 25 ⁰ C	±5 mg/L ±5% of reading
4	Light source	Tungsten lamp
5	Light Dector	Silicon photocell with narrow band interference filter @525nm
6	Power supply	9V battery
7	Auto-off	After ten minutes of non use in measurement mode3;after one hour of non- use in calibration mode ; with last reading reminder
8	Environment	0 to 50 ⁰ C ; RH max 95% non- condensing
9	Reagents	Reagents must be supplied for test of Chlorides and residual chlorine of water and for 100 tests.
10	methods	Adaption of cadmium reaction method causes amber tint in sample.
H1	PH, Electric conductivity IS 10500: 1991	It must stores up to 1000 records: 200 records (log-on-demand and stability logging); 600 records interval logging, must have 1 USB port for storage; 1 micro USB port for charging and PC connectivity, glass body pH electrode with 1/8”(3.5mm) connector and 1 m (3.3’) cable, 5 VDC adapter. It should enable users to check validity of calibratiobn, alerts the user of low battery power that could adversely affect reading.
a	PH Meter	pH 4 buffer solution, pH 7 buffer solutions, pH 10 buffer solutions, Electrode cleaning solutions for 100 experiments and Quality certificate must be supplied with it.
i	Range	basic mode: -2.00 to 16.00 pH, -2.000 to 16.000 pH; standard mode: ±1000.0 mV for pH.
ii	Resolution	0.01 pH; 0.001 pH; 0.1 mV
iii	Accuracy @ 25 ⁰ C	±0.01 pH; ±0.002 pH; ±0.2 mV
iv	Calibration Points	5 in standard mode; 3 in basic mode
v	Calibration Buffers	standard mode: 1.68, 4.01, 6.86, 7.01, 9.18, 10.01, 12.45 and two custom buffers. Basic mode: 4.01, 6.86, 7.01, 9.18, 10.01
vi	Temperature Compensation	ATC (-20 ⁰ Cto 120.0 ⁰ C; -4.0 to 248.0°F)

vii	Electrode Diagnostics	Standard mode: probe condition, response time and out of calibration range.
b	Electric Conductivity Meter	1413 $\mu\text{S}/\text{cm}$ conductivity standard, 12880 $\mu\text{S}/\text{cm}$ conductivity standard and Quality certificate must be provided with it.
i	Range	0.00 to 29.99 $\mu\text{S}/\text{cm}$; 30.0 to 299.9 $\mu\text{S}/\text{cm}$; 300 to 2999 $\mu\text{S}/\text{cm}$; 30.0 to 200.0 mS/cm; up to 500.0 mS/cm (absolute EC).
ii	Resolution	0.01 $\mu\text{S}/\text{cm}$; 0.1 $\mu\text{S}/\text{cm}$; 1 $\mu\text{S}/\text{cm}$;0.01 mS/cm; 0.1 mS/cm
iii	Accuracy @ 25 ⁰ C	$\pm 1\%$ of reading , \pm (0.5 μS or 1 digit, whichever is greater)
iv	Calibration	1 point offset calibration (0.00 $\mu\text{S}/\text{cm}$ in air); 1 point slope calibration in EC standard 84 $\mu\text{S}/\text{cm}$, 1413 $\mu\text{S}/\text{cm}$, 5.00 mS/cm, 12.88 mS/cm, 80.0 mS/cm and 118.8 mS/cm.
v	Temperature Compensation (TC)	No TC, ATC (-20.0 to 120.0oC; 32.0 to 122.0 °F)
vi	TDS Factor	0.40 to 0.80
I1	BOD Sensor IS 3025(Part-44)	<p>The BOD Sensor must be mercury-free and reliable for BOD determination, Easy to handle, quick and easy to read, must have microprocessor-controlled pressure transducer to transfers the BOD value directly to the display, results must be displayed directly in mg/l . Must store 5 BOD measurements at 24-hour intervals and the BOD value can also be obtained directly from the display at any time, even after five days. Measurement must be available on 4 different scales - 90, 250, 600 and 999 ppm BOD. It must have BOD Sensor, a dark glass bottle, an alkali holder to absorb the carbon dioxide and a stirring bar. The dark glass bottle can take sample quantities of from 100 to 400 ml.</p> <p>The BOD Sensor Set must be designed for use with the VELP MST magnetic stirrer. The MST magnetic stirrer with ABS structure must be small, simple and efficient stirrer. The MST stirrer must remain cold even after several days of continuous use.</p>
1	Construction material	Technopolymer
2	Power	2W
3	Power supply	230 V / 50-60 Hz

4	Bottle total capacity	500 ml
5	Stored data:	5 BOD values at 24h intervals
6	BOD values:	directly on the display at any time also after the standard 5 days period
7	BOD last determination:	possible
8	Scales:	90, 250, 600, 999 ppm BOD. Higher values after dilution
9	Display	digits 3 LED
10	Safety class:	3 IEC 1010
11	Electronic protection degree	IP 54
12	Number of specimen to be supplied	3
J1	Cooled Incubator	A+ class cooling system and conserve energy with VELP units, Wireless Connection system, dedicated software for temperature regulation, Temperature Regulation from +3 to +50 °C , Auto-Tuning thermoregulation system for optimum thermal homogeneity and stability at any temperature, set point, minimum and maximum temperature alarm thresholds, Instantly view the trend of the internal temperature on a graph, Automatically record the temperature trend on a spreadsheet.
1	Display	3-digit LCD display
2	Total volume	120 liters
3	Settable Temperature	from 3 to 50 °C
4	Temperature stability and homogeneity	± 0.5 C°
5	Electronic thermoregulation system:	Auto-Tuning
6	Shelves (supplied; maximum)	2
7	Internal plugs	2
8	Capacity	3x BOD Sensor System 6 or 2x BOD Sensor System 10
9	Power supply	230V-50/60Hz
10	power	120W

K1	JAR TEST APPARATUS:	Designed for floc formation test in water treatment plant. Uniform stirring of up to 4 samples simultaneously. Variable speed 20-100RPM. Heavy duty 1/20HP motor with gear train mounted on a mild steel housing. Supported by four rods on a bench. Stainless steel stirring paddlers with adjustable height. Locking collars or stirring rods permit adjustment height of paddle height. Spacing of 6' (150mm) between rod permit use up to 1000ml beaker.
1	Housing Material	CRC / MS sheet duly powder coated.
2	Power Consumption	220/230V AC supply 50HZ single phase
3	Motor	1/ 20HP Motor good quality
4	Illumination	By Tubes Light (With choke + Stirrer) Duly covered by Perspex sheet having control switch fitted on the control panel
L1	Colony Counter	A 100 mm dia lens covers the entire illumination field. Automatic 4 digits LED digital display. Each touch of Marking pencil on the petridish increments the colony count by '1'. Maximum colony count possible up to 9999 . 220V 50 Hz single phase AC supply
M1	Thermo reactor COD Analysis	16 position thermo reactor for Chemical Oxygen Demand (COD) with settable temperature (up to 160°C) and operating time (up to 199 minutes). Electronic temperature control Temperature regulation from ambient to 200 °C . Analysis time can be set from 1 to 199 minutes or continuous. Processes up to 14 x Ø 16 mm ml test tubes. Plus 2 x Ø 22 mm test tubes simultaneously. LCD countdown display shows the temperature and remaining time. COD analysis in only 30 minutes at 160 °C. 16 mm diameter tubes minimize reagent consumption.
N1	Total solids, Settlable solids, Dissolved Solids, Suspended Solids, Volatile solids	
a	Muffle furnace	It must be supplied with Data logger, safety

		switch on door, temperature chart recorder, extra port for gas – Extra heating element and rod with clips, extra thermocouple, tongs, gloves, must have provision for connecting printer.
1	Max. Temperature	900 ⁰ C
2	Working temperature	800 ⁰ C
3	Heating element	Kanthal A-1
4	Temperature Accuracy	+/- 1 ⁰ C (+/- 1.8 ⁰ F)
5	Temperature Controller	PID Controller
6	Display	LED/LCD Display
7	External Chamber Construction	Msw Powder coating/ 304 grade stainless steel
8	Internal Chamber construction	Ceramic board and grooved refractory chamber as per temp. Requirement
9	Insulation	Ceramic wool insulation
10	Alarm	Audible and visual type
11	Power supply	220 / 440 Volts
12	Certification	ISO, CE & GMP
13	Stabilizer	As standard
14	Volume of inner chamber	13 liter
b	Vacuum pump	Provision of inlet and outlet mist filter must be there. Blade kit and Spare kit for major service requirement, Anti vibration mounting pads for mounting the pump, Tool kit for servicing of pump, Ten meter flexible vacuum pipe (ID -1 inch) must be supplied.
1	Type	Two stage rotary vacuum pump (oil type)
2	Drive	Direct drive with 10-15 HP motor having ip55 protection
3	Displacement	250 m ³ h ⁻¹ at 50 Hz (minimum)
4	Power requirements	440V, 3 Phase, 50 Hz AC
5	Ultimate vacuum	1.0 x 10 ⁻³ mbar / 7.7 x 10 ⁻⁴ Torr (without gas ballast) or better
6	Noise Level	≤ 75 dB
7	Outlet connection	ISO40 flange centre tapped
8	Inlet connection	ISO63 blank flange with seal
9	Cooling	Water cooled with inlet and outlet water connection
c	Water bath	Must have corrosion resistance provision. Double walled chamber, inner made of thick

		stainless steel Sheets and outer made of mild steel sheets duly finished in powder coating. Glass Window provided on the front side for an easy inside view. Inner space in between the walls tightly packed with special grade glass wool.
1	Temperature range	0 ⁰ -120 ⁰ C
2	capacity	40 liter
3	IP rating	31
4	Temperature stability	+/- 0.5 ⁰ C
d	Porcelain Evapourating disk	50 ml (3 no),75 ml (3 no.s), 100 ml (3 no.s)
e	Desiccator	It must stand high temperature up to 350 ⁰ C. The body of the mantle must spun one piece from non-rusting Aluminum (up to 5.0 liters Capacity) duly stoving painted. All heating mantles must be lagged with special grade mineral wool. It must hold vaccum upto 740 mm of Hg for 24 hrs without any greasing. The top dome must be moulded in rigid and transparent Polycarbonate to give a crystal clear view of the desiccant placed inside. There must be Knurled knob on the top to provide easy handling of the dome. The lower part must be made of Polypropylene. An internal groove must be provided on the flange to hold a silicon rubber O-Ring. The Polypropylene stopcock must be fitted with a self lubricating PTFE plug. This plug must work in three way i.e. vaccum creation, shutting off & vaccum releasing.
f	Gooch Crucibles	100 ml capacity
g	Graduated Cylinders	25 ml. (3 nos) , 50 ml. (3 nos), 100 ml (3 nos), 250 ml (3nos), 500 ml (3 nos)
h	Filter papers	10 no.s
i	Dish Tongs	3 no.s
j	Crucible tongs	3 no.s
k	Forceps	3 nos