TENDER NOTICE
NO. MPPCB/PURCHASE/01/2013-14

TENDER DOCUMENT

FOR SUPPLY OF

LABORATORY INSTRUMENTS

Year: 2013 - 14

M. P. Pollution Control Board
E-5 Sector, Paryawaran Parisar,
Arera Colony, Bhopal – 462016

PBX : +91(0755) 2464428 / 2466191
FAX : +91(0755) 2463742
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M. P. POLLUTION CONTROL BOARD

PARYAWARAN PARISAR, E-5, ARERA COLONY, BHOPAL – 16
Phone: [0755] 2466191/2464428 Fax: [0755] 2463742 E-mail: it_mppcb@rediffmail.com

TENDER NOTICE NO. MPPCB/PURCHASE/01/2013-14

Sealed tenders are invited from the reputed manufacturers [approved by BIS/ISO for quality & precision] and / or their authorized dealer / agent /representatives, specially authorized for this tender, for the supply of following laboratory instruments:

Sl. No.	PARTICULARS OF ITEMs	Qty.	EARNEST MONEY [Rs.]
1.	Atomic Absorption Spectrophotometer [GTA /FLAME / VGA]	02	80000.00
2.	BTEX Analyzer/Monitor	02	60000.00
3.	Bacteriological Incubator	02	3200.00
4.	COD Digestion Assembly	03	3600.00
5.	Columns for Gas Chromatograph	02	4000.00
6.	Dissolved Oxygen meter [Handheld Type]	01	2000.00
7.	Desiccators for PM $_{2.5}$ Sampler	11	5500.00
8.	Flue Gas Analyzer	08	48000.00
9.	Orsat Gas Analyzer	01	2000.00
10.	pH Meter [Pen Type]	24	4800.00
11.	PM $_{2.5}$ Sampler	22	132000.00
12.	Stack Monitoring Kit	02	4000.00
13.	Noise Level Meter	08	40000.00
14.	Safety Personal Protective Equipment	02 sets	13000.00
15.	Turbidity Meter	05	5000.00
16.	Water Analyzer	01	2000.00
17	Weather Monitoring Station	04	12000.00

The tender document including technical specifications of equipment shall be issued up to 3.00 PM on dated 08.08.2013 on payment of Rs. 1500.00 [Rupees One Thousand Five Hundred only] by cash or demand draft [Rs. 50.00 extra for supply of documents by post] in favor of Member Secretary, M. P. Pollution Control Board, Bhopal. The application for sending tender document by post shall not be accepted after 07.08.2013. The earnest money of requisite amount shall be submitted in a separate sealed envelop mentioning the details thereof. No tender shall be considered without requisite earnest money. The last date for submission of tender is 12.08.2013 by 1.00 PM and the same shall be opened on the same day at 3.00 PM in the presence of bidders, who wish to participate. The detailed terms

& conditions are available in tender document. This Tender Notification may also be downloaded from Board's Web site www.mppcb.nic.in and www.govtenders.nic.in and the cost of tender document should be submitted in the form of demand draft along with Earnest Money in Envelop "A".

[R. K. Jain]
Member Secretary

M. P. POLLUTION CONTROL BOARD

PARYAWARAN PARISAR, E-5, ARERA COLONY, BHOPAL – 16
Phone: [0755] 2466191/2464428 Fax: [0755] 2463742 E-mail: it_mppcb@rediffmail.com

To,

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……

Sub.: Sealed tenders for purchase of laboratory equipment.

Dear Sir,

M. P. Pollution Control Board desires to procure laboratory equipments and Filter Papers for its laboratories spread over whole of the state. Sealed tenders are invited from the reputed manufacturers [approved by BIS/ISO] or their authorized representatives, specially authorized for this tender, who are capable of supplying laboratory equipment, which are shown on tender notice. The terms and conditions are as follows:

[A] ***SPECIAL CONDITIONS:***

1. All prices quoted should be CIF New Delhi for imported equipment. Other charges like transportation, insurance, F.O.R. destination and installation charges should be quoted separately. For indigenous equipment prices should be F.O.R. destination.

2. Prices should be quoted for complete set of equipment including the cost of installation, minor civil works, electrical fittings and cabling etc.

3. Accessories required [if any] for maintenance for a period of three years should be given separately.

4. Annual Maintenance charges for three years should be quoted separately in Annexure – 2.

5. The technical specifications of the equipment are given on page no.17 to 44. The technical specifications of the offered equipment should be furnished in annexure – 1. Schedule of requirement is annexed as annexure-5. The check list is shown as annexure -6.

5. The equipment offered should necessarily contain a guarantee for its trouble free performance for a period of one year from the date of installation.

6. The offer should clearly mention make, name of the manufacturer, detailed specifications, detailed literature about the equipment/circuit diagram/drawing of the mechanism and any other information relevant to the equipment. For any printing error / mistake in final bid will be the responsibility of the bidder and no correspondence will be entertained by the Board in future.

7. The tenderer should furnish details of supplies made by him to important institutions, along with performance certificate, during last one year [Users' list].

8. The firm / manufacturer submitting the offer shall only quote for one most suitable model of the offered equipment whose specification matches the Board's specifications. No alternate offers shall be considered and, if submitted, the offer shall be rejected.

9. Earnest money be furnished by a demand draft in favor of Member Secretary, M. P. Pollution Control Board, Bhopal in envelop"A". Offers without earnest money shall not be considered and the relevant envelops [B & C] will not be opened and their offer shall be treated as rejected.

10. Bidders suing downloaded tender forms must submit tender fee by demand draft along with Earnest Money in Envelop "A" drawn of Member Secretary, M. P. Pollution Control Board, Bhopal. The tender will not be accepted from the firm to whom the document is not issued by the Board and the bid downloaded from net without tender fee will not be accepted.

11. The bidder shall have to submit the copy of sales tax registration and Income Tax registration [PAN] along with envelop "B" otherwise the offer shall be liable for rejection.

12. An undertaking shall be submitted by the tenderer that they are not black listed in any Govt. organization / institutions along with envelop "B".

13. The bidder shall provide exclusive company profile including necessary certificates / license for manufacture the product from DGTD / SSI/SIA etc.

14. The specifications are clearly mentioned in the document and the Bidder is requested to submit Bid only if their offer strictly comply to these specifications. Please note that no deviation in the required specification will be permitted. The bidding for the instruments having different specification will be on Bidder's risk as the Board will not entertain such Bids.

15. **PROCEDURE FOR SUBMISSION OF TENDERS :**

Each bidders shall submit his offer in three sealed envelops A, B and C. Envelop "A" shall contain earnest money and tender cost, if the tender document is downloaded from the web site. The Envelop "B" should contain technical specification, terms & conditions, company profile, copy of sales tax registration number, PAN number and authorization certificate from manufacturer for submission of offer for this tender, if offer is submitted by authorized representative. In case the manufacturer of any equipment authorizes more than one firm for submitting offer, then such offers shall be treated as rejected. Envelop "C" shall contain financial offer.

[a] Envelop – "A" : Envelop "A" should contain demand draft for the requisite amount of earnest money in favor of Member Secretary, M. P. Pollution Control Board, Bhopal. If the tender document is downloaded from web site, then separate demand draft for tender cost shall be submitted with envelop" A". The name of instrument and the amount of the demand draft should be inscribed on the top of envelop. Envelop "A" shall be opened on 12.08.2013 at 3.00 pm in the presence of the bidders or their authorized representatives. Insufficient amount furnished as earnest money and tender cost shall make the offer liable for rejection.

[b] Envelop – "B": Bidders, who have furnished the desired amount of earnest money and tender cost shall be liable for opening of the Envelop "B" of their offer. The Envelop "B" should contain detailed technical specifications in annexure –1, make & model of the equipment, functioning procedure of the equipment and other literature relevant to the equipment and company profile. If the offer is submitted by authorized representative, he should submit authorization letter in envelop "B" from the manufacturer for submitting offer for this tender, otherwise tender offer of the firm shall not be considered and liable for rejection. The tenderer should furnish users' list and details of supplies made by him to important institutions along with performance certificate. The bidder shall have to submit the copy of sales tax registration and income tax no. [PAN] along with the envelop "B", otherwise the offer

shall be liable for rejection. An undertaking shall be submitted by the tenderer, regarding whether they are not black listed in any Govt. organization / institutions, along with envelop "B". The details of service station in Madhya Pradesh and India should be furnished with other details.

[c] Envelop – "C" : The envelop "C" shall contain financial offer in annexure 3 or 4 [whichever is applicable] of the tender document. Offers received in due time shall be evaluated technically by a committee constituted by the Chairman, M. P. Pollution Control Board and as per the recommendation of committee , depending upon the suitability of equipment with respect to application, performance, after sale service and service centers in Madhya Pradesh or in India etc., the financial offer shall be opened.

[B] <u>OTHER CONDITIONS</u>:

1. The Madhya Pradesh Pollution Control Board reserves its rights to reject any or all the tenders without assigning any reason there for.

2. Tender found incomplete shall be rejected forthwith.

3. The indigenous equipment, for which an order has been placed, after acceptance of the tender, shall have to be delivered, installed & demonstrated to the consignee mentioned in the supply order within 60 days from the date of issue of supply order. In case of late supply of the material, 2% per month penalty shall be charged up to one month, there after supply order shall be treated as cancelled and earnest money shall be forfeited and the supply order shall be issued to the second lowest firm. In case of unavoidable delay in supply a prior permission shall be obtained for extension in delivery period.

4. The time limit for the supply of imported equipment shall be 90 days, which can be relaxed for additional 30 days by the Member Secretary. After scheduled time limit, 2% per month penalty should be levied.

5. If the bidder is not a manufacturer himself, should have a facility for repairing and maintenance of the instrument. The details of service centers in Madhya Pradesh and India should be furnished along with other details.

6. It shall be the responsibility of the bidder to deliver the material to the consignee in sound condition without any damage. Any damage or loss during transit shall be on the account of the bidder.

7. The tenders shall be valid for a period of 180 days from the date of opening of envelop "A". In case the validity is to be extended; the Board may solicit the Bidder's consent to an extension on the period of validity and the bid shall remain valid for the extended period mutually agreed for.

8. The prices should include all taxes like sales tax, excise tax or any other tax.

9. In case of equipments, the approved firm / manufacturer shall have to submit 5% security deposit of the ordered value in the form of Bank Guarantee for a period of 12 months, other wise 5% amount shall be deducted from the bill.

10. In case the approved bidder fails to effect supply, within the specified period as per supply order, the earnest money is liable to be forfeited.

11. The consignee or any other officer authorized by the Board shall have the right to reject any or all the items of the supply, if they do not confirm to specifications mentioned in the supply order. The rejected items shall be lifted by the bidders at their own cost. The consignee will not be responsible for the custody and safety of such items.

12. The Board reserves its rights to effect any reasonable increase or decrease in the quantity or number of items at the time of issue of supply order in the interest of the Board.

13. All the clearance including the obtaining NMI [Not manufactured in India] certificate, custom clearance and custom duty will be the responsibility of the tenderer. This office will open the letter of credit [L/C] as may be required and will only sign the documents wherever required.

14. In case, if any supplier quote their rates in Indian Rupees for imported equipment and do not require custom duty exemption certificate from the Board, then the supplier has to submit import document like bill of entry, custom duty paid and NMI [Not manufactured in India] certificate from the manufacturer.

15. The bidder is expected to examine all instructions, forms, terms and conditions and specifications mentioned in the bid document. Failure to furnish all information required by the bid documents of submission of a bid not substantially irresponsive to the bid document in every respect will be at the bidder's risk and may result in the rejection of it's bid.

16. The terms of payment shall be as under:

[A] Indigenous Items: 75% of the cost of material would be paid after receipt of the material by consignee and balance 25% payment shall be released only after satisfactory installation and demonstration of the equipments / material at site.

[B] Imported equipments: The letter of credit will be opened for total ordered value, but 75% of the cost will be released on shipment of the material and balance 25% payment shall be released only after satisfactory installation and demonstration of the equipments / receipt of material at site.

17. Conditional offers will not be accepted and liable for rejection.

18. In case of human error regarding labeling of envelop, the committee constituted for the opening of envelop shall take appropriate decision.

19. In case of any dispute the decision of Chairman, M. P. Pollution Control Board shall be final & binding.

20. In order to comply the instructions of Department of Commerce & Industries, Govt. of M.P., minimum 30% of the quantity of the items shall be reserved for the manufacturers / entrepreneurs from Scheduled castes/ scheduled tribes based at Madhya Pradesh.

NOTE: The tenders shall be liable for rejection in breach of any of the special or other general conditions of the tender document and no correspondence in this regard shall be entertained in future.

[R. K. Jain]
Member Secretary

MADHYA PRADESH POLLUTION CONTROL BOARD

TENDER AND CONTRACT FOR SUPPLY OF MATERIALS GENERAL RULE AND DIRECTIONS FOR THE GUIDANCE OF SUPPLIERS

(1.) All suppliers proposed to be obtained by contract will be notified in a form of invitation to tender posted in public places/News Paper.

(2.) The tender form will State the supplies to be made, as well as the date for submitting and opening tenders and the time allowed for supply, also the amount of earnest money to be deposited with the tender.

(3.) In the event of tender being submitted by a firm it must be signed separately by each member thereof or in the absence of any partner, it must be signed on its behalf by a person holding a power of attorney authorizing him to do so, such power of attorney should be produces with the tender and it must disclose that the firm is duly registered under the partnership Act.

(4.) Any person who submits a tender shall fill up usual printed form stating at what rate he is willing to undertake supply of each items. Tender which propose any alteration in the work/supply specified in the said form of invitation to tender, or time allowed for carrying out work/supply will be liable for rejection.

(5.) The Member Secretary or his duly authorized assistant will open tenders in the presence of any tenderer who may be present at the time and will enter the amount of several tenders in a comparative statement in a suitable form. Receipts for earnest money will be given to all tenderers except those whose tenders are rejected and whose earnest money is refunded on the day that the tenders are opened.

(6.) The officer competent to dispose of the tenders shall have the right of rejecting all or any of the tenders.

CONDITIONS OF CONTRACT

1. The time allowed for the supply of materials as entered in the tender shall be strictly observed by the supplier and reckoned from the data of which the order to commence supply of materials shall throughout the stipulated period of the contract be proceeded with allude diligence (time being deemed to be the essence of contract) on the part of the supplier and the supplier shall pay

as liquidated damage an amount equal to one percent or such smaller amount as the Member Secretary, M.P. Pollution Control Board, may decide on the amount of estimated cost of the whole of the materials as shown in the estimated cost of the that the supply remains un commenced or unfinished after the proper dates. In the event of the contractor failing to comply with this condition shall be liable to pay as liquidated damage an amount equal to one percent or such smaller amount as the Member Secretary may decide on the said estimated cost of the whole of the materials for every day that the due quantity of supply remains incomplete to, provided that the due quantity of liquidated damage to be paid under the provisions of this clause shall not exceed ten percent on the estimated cost of the supply of materials as shown in the tender.

2. If the Tenderer shall be hindered in the supply of the materials so as to necessitate an extension of the time allowed in this tender he shall apply in writing well in advance or immediately after the cause occur to the Member Secretary, M.P. Pollution Control Board who shall if in his opinion (which shall be final) reasonable grounds be shown therefore authorize such extension for a period not exceeding in 15 days. Any further extension shall be subject to the previous sanction of the Chairman.

3. The supplier shall give notice to the consignee officer of his intention of making delivery of materials and on the materials being approved a receipt shall be granted by him to the Consignee Officer or his assistant, and no material will be considered for payment until so approved.

4. On the completion of the delivery of the materials the supplier shall be furnished with a certificate by the Consignee Officer of M.P. Pollution Control Board.

5. The material shall be of the best description and in strict accordance with the specification and the supplier shall receive payments for such materials only as are approved and passed by the Member Secretary/Consignee Officer.

6. In the event of materials being considered by the Consignee Officer to be inferior to that described in the specification the supplier shall on demand in writing forth with remove the same at his own charge and cost and in the event of his neglecting to do so within such period as may be named by the Consignee officer that officer may have such rejected material removed at the contractor's risk and expense incurred being liable to be deducted from any sum due or which may become due to the supplier.

7. Receipts for payment made on account of a supply when executed by a firm must also be signed by several partners except where the contractors are described in their as a firm in which case the receipt must be signed in the name of firm by one of the partners are by some other person having authority to give effectual for the firm.

8. Under no circumstances whatever shall the contractor be entitled to any compensation from Board on any account.

9. The supplier shall supply at it own expense all tools, plant & implements required for the due fulfillment of his contract and the materials shall remain at his risk till the date for final delivery, unless it shall have been in the mean time removed for use by the Consignee Officer.

10. No materials shall be brought to site or delivered on Sunday/holiday without the written permission of the Consignee Officer.

11. The supplier shall not sublet this contract without the written permission of the Member Secretary, M.P. Pollution Control Board. In the event of the contractor subletting his contract without such permission, he shall be considered to have thereby committed a breach of the contract, and shall forfeit his earnest money and shall have no claim, for any compensation for any loss that may occur from the materials he may have collected or engagements entered into.

12. The decision of the Chairman, M.P. Pollution Control Board, Bhopal shall be final, conclusive & binding on all parties to the contract upon all questions relating to the meaning of specification and instructions herein before mentioned and as to qualify of materials or as to any way arising out of, or relating to the contract specifications, instruction orders of these conditions or otherwise concerning the supplies whether arising the progress of after the completion or abatement thereof.

13. On the breach of any term of condition of this contract by the supplier, the said Chairman shall be entitled to forfeit the earnest money, security deposit and the balance thereof that may at that time be remaining and to realize and retain the same as damages and compensation for the said breach but without prejudice to the right of the said Board to recover any further sums as damages from any sums due or which may be come due to the contractor by M.P. Pollution Control Board, or otherwise howsoever.

Annexure – 1

TENDER SPECIFICATIONS VS OFFERED SPECIFICATIONS

Sl. No.	Tender Specifications	Offered Specifications

Signature of Bidder ----------
Name ----------
Business Address ----------

Place: ----------
Date : ----------

Annexure – 2

PRICE SCHEDULE FOR ANNUAL MAINTENANCE AND REPAIR CHARGES AFTER WARRANTY PERIOD

Sl. No.	Item Description	Qty.	Annual Maintenance & Repair charges for each unit including supply of spares [Price to be quoted either in Indian Rupees or in Foreign currency] Excluding guarantee period	Maintenance and Repair charges for 3 years, including supply of spares.

Note: In case of any discrepancy between unit price and total price, the unit price shall prevail.

Signature of the Bidder ----------
Name ----------
Business Address ----------

Place ----------
Date ----------

Annexure – 3

PRICE SCHEDULE FOR GOODS IMPORTED

1	2	3	4	5	6	7
Sl. No.	**Description**	**Country of origin**	**Quantity**	**Unit Price CIF New Delhi**	**Total CIF price per item**	**Unit price pf Inland delivery to final destination and unit price of other incidental services.**

Note: In case of discrepancy between unit and total price, the unit price shall prevail.

Signature of the Bidder……..
Name ……..
Business Address ……..
…….

Place: ……
Date: ……

Annexure – 4

PRICE SCHEDULE FOR GOODS INDIGENOUS

Sl. No.	Name of equipment with make & model	Unit Price in Rupees	VAT/CST or any other Tax/duty	Unit price including all taxes up to final destination

Note: In case of discrepancy between unit and total price, the unit price shall prevail.

Signature of the Bidder……
Name ……..
Business Address ……
…….

Place: ……
Date: ……

TECHNICAL SPECIFICATIONS

Item Sl. No. 1

ATOMIC ABSORPTION SPECTROPHOTMETER [GTA /FLAME / VGA]

S. No.	Specification	Requirement
1.0	INSTRUMENT COMPOSITION	Atomic Absorption Spectrophotometer (GTA/FLAME/VGA), Unit for Flame (Air Acetylene and nitrous oxide- acetylene), Graphite Tube Atomizer (GTA), Chiller / Water circulating unit, Auto samplers for GTA and flame
2.0	TECHNICAL SPECIFICATION	
	Atomic Absorption Spectrophotometer	Computer Controlled with built-in flame emission mode
	Wave length range	190 – 800 nm wave length
	Sensitivity	Sensitivity at least 0.35 abs for 5µg/ml aqueous copper standard solution with air – acetylene flame
2.1	Optics	Double Beam dual blazed / holographic Monochromator
	Focal length	At least 250 mm focal length
	Resolution	1800 lines / mm
	Width	Automatic bandwidth of 0.2 to 2.0 nm
2.2	Flame Atomizer	All titanium or equivalent burner with impact bead / Flow spoiler, premix Design
	Movement	Automatic movement into the sample compartment
	Affect from Acids /Organic solvent	Unaffected from attacks by acid solution or organic solvents (e.g. Methyl isobutyl Ketone i.e. MIBK
	Flame Alignment in liquid beam	Fully automatic, optimized with motorized burner mount for vertical and horizontal burner adjustment
	Nebulizer	High precision able to provide manually adjustable uptake rates material of the nebulizer and related Venturi should be inert to acid solutions and organic solvents such as MIBK
2.3	Flame Control	Computer controlled ignition
2.4	Gas Control	Computer controlled with oxidant and fuel gases monitoring to monitor constant fuel / oxidant ration ignition

2.5	Safety Function	Interlocking system to prevent ignition
2.6	Essential Interlock Monitor	Burner type as well as its presence in position, air selector, flame sensor, liquid trap level, gas supply pressure and air supply anywhere in the network of gas tubings in the system
2.7	Automatic Lamp Selection Function	Computer controlled Hollow Cathode Lamp selection and alignment
	Lamp Holder	At least 8 lamp holder with built in power supplies for hollow cathode lamps and electrode – less discharge lamps or equivalent
	Operating Parameter setting	Automatic Setting
2.8	Read Out /Display	Display facility for absorbance as well as concentration, Display of errors or error codes, absorbance range at least up to 2.0 Abs.
	Scale Expansion	Scale expansion at least up to 100x
	Integration time	Integration time should cover at least 0.2 to 50 seconds range
	Measurement	Measurements of mean, RSD and CV, Background only mode, Integration of peak height and peak areas.
2.9	Accessories / Spares with Flame AA System	
2.9.1	Vapour Generation Assembly	Should be continuous flow based hydride / mercury vapour generator with option of using with or without a programmable auto sampler
	Precision	Precision of better than or at least 1% at ppb levels of mercury, arsenic etc.
	Absorption Cell	The absorption cell's material should have no effect of the high heat of the flame and the cell for the analysis of mercury should be of a closed cell design
	Flame Arrester	Flame arrester should be provided in the tube which connects the assembly to the absorption cell
	Cell Design holder	The design of the cell holder should give a firm and easily adjustable (for alignment) mounting on the burner head.
	System accessories	Complete with necessary reagent bottles, connectors etc.
2.9.2	Hollow Cathode lamps	16 hollow cathode lamps. One lamp each for the elements: Arsenic, Antimony, Boron, Calcium, Chromium, Cobalt, Copper, Iron,

		Nickel, Lead, Manganese, Mercury, Selenium, Tin, Vanadium and Zinc. Equivalent coded lamps will also be acceptable.
2.9.3	Air Compressor with Air Filter or equivalent Air Service Unit	Complete with pressure regulator quite in operation, necessary tubing and connectors and should meet the air supply requirements of AAS operation.
	Oil Free Pump	Oil- free pump and moisture trap
	Corrosion Resistant	Resistant to acidic vapour and the drain value (if any) should be made of stainless steel of equivalent corrosion resistant material
2.9.4	Gas Regulators	
	Nitrous – oxide gas regulator	Nitrous Oxide Gas regulator (two stage) with heater, with necessary tubings and connectors. Necessary transformer should be provided to transform this supply to the requirements of the heater. The heater should work on 230±10volts 50 Hz AC power supply.
	Acetylene Gas regulator	Acetylene gas regulator (two stage) with necessary tubing and connectors.
	Nitrogen Gas regulator	Nitrogen regulator (two stage) with necessary tunings and connectors.
2.10	Graphite Furnace System	
	Graphite Tube Atomizer	Should be computer controlled fully enclosed graphite tube system consisting of stabilized temperature / total pyrolytic graphite plate form.
	Gas Supplies	Provision of two gas supplies (programme selectable) with independent control over the gas supply through the furnace.
	Heating Rate	Heating rate of at least 2000°C per second
	Cooling Time	Cooling time 20 seconds
	Temperature Range	Temperature range ambient to 2600°C or more in 1°C increments
	Feed back system	Feed back system for furnace temperature control, interlocks for water, gas, temperature, furnace door, graphite tube damage and mains power.
	Temp. Programming	At least eight steps temperature programming facility with flexibility of programme selection, ramp time, gases, gas flow and read trigger for

		each temperature step.
	Control	Computer controlled with appropriate provision for print out of the furnace and sample parameters
	Display	Calibration data / graphs, temperature profiles, signal graphics and the instrument status.
	Memory	Memory should be able to store at least ten non volatile programmes
	Ciller / Cooling Water Re-circulation Unit	Refrigerating water circulation unit of appropriate capacity. No discharge of water from this water circulation unit.
3.0	DATA WORK STATION	
3.1	Application Software	Programme facility with multitasking software
		Should provide complete control of instrument with instrument status display and its various accessories.
		Provide accurate and reproducible time averaged, integration, non – averaged integration, multi level calibration.
		Software should handle instrument linear absorbance reading, concentration, or emission intensity, integration time, built-in statistics, calibration equation control, slope of analytical curve using operator selective calibration standard
		Built-in interface for computer connection and use of optional accessories.
		Comprehensive quality control protocols facility including blank, multiple quality control standards, QA/QC audit trail and calibration failure.
3.2	Computer System	
	Make	Reputed brand such as HP/Compaq/IBM/ Dell
	Processor	Intel core 2 duo processor 3.00 GHz or above
	RAM	4 GB (upgradable up to 8 GB)
	HDD	500 GB ultra DMA or higher HDD (7200 RMP)
	Monitor	21" TFT – LCD Flat Colour
	CD ROM	52X CD- ROM
	DVD-CDRW	32X DVD-ROM and CDRW – combo Drive Max speed 48x24x48

	Ports	2 serial, 1 parallel and 2 USB front 6 rear USB2 PS/2 Port, 1 VGA integrated Port 1line in/out port
	Key Board	104 keys
	Mouse	Optical mouse with pad
	Ethernet	32 bit auto selectable 10/100 MBPS
	Graphics	Internet ready with integrated graphics
	Sound	Integrated sound card and inbuilt stereo speakers
	Printer	HP Laserjet Printer 1200 x 1200 dpi 12 PPM black
3.3	Operation Software	Preloaded Windows XP Professional operating system with Licensed CD
		MS Office 2000 Standard with media, manual and Licensed CD
		Preloaded Antivirus with latest version along with Licensed CD
4.0	ADDITIONAL ITEMS	Following items to be supplied
	Operation Kit	Manufacturers Standard Operation Kit including all required items, tubings, fittings for start up / regular operation of instrument.
	Operation / maintenance Manual	Operation / maintenance Manual for each unit
	Analytical manual	Analytical manual including applications for flame, VGA and graphite system
	Service Manual	Service manual with one set of required tools for each system / unit
	Trouble Shooting Charts	Trouble Shooting Charts
	Spare parts Catalogue	Spare parts Catalogue
	Application Notes	Application Notes for trace metal analysis in environmental, biological, geological, metallurgical and industrial samples
	Dust Cover	One for each unit
	Consumables	For three years operation for each of the following units: Flame AAS (basic unit, burner system) Vapour generation assembly Graphite Furnace Atomizer Auto sampler
5.0	Operation and Maintenance Training	Two weeks training to be provided to two scientist on software training, operation,

		maintenance and troubleshooting aspects of instrument.
6.0	General Conditions of Supply	The instrument and all its units should operate on 230 ±10 volts 50Hz power supply All the operation and maintenance manuals, circuit diagrams, application notes and application softwares to be supplied should be in English Language. The supplier / manufacturer should have Indian Agent to provide after sales service. The main unit and all the sub units of the instrument should be serviced by the Indian representative of supplier. The Bidder should be a manufacturer / authorized representative of a manufacturer, who must have designed, manufactured, tested and supplied two numbers of such equipment similar to the type specified in the past five years, which shall be in successful operation for at least 2 years as on the date of bid opening. The bidder should furnish the information on past supplies and their satisfactory performance. Bidders shall invariably furnish documentary evidence (client's certificate – at least two) in support of the satisfactory operation of the equipment as specified above. Notwithstanding anything stated above the purchaser reserves the right to assess the capability and capacity of the bidder to perform the contract, should the circumstances warrant such an assessment in the overall interest of the purchaser. Comprehensive warranty with spares for three years from the date of installation of the instrument should be covered.

Remarks: Buy-back price for old Atomic Absorption Spectrophotometer [Make: GBC Scientific Equipments, Australia, Model: Avanta PM, Year of Installation: 2000] may also be quoted.

Item Sl. No. 2

BTEX MONITOR / ANALYZER

GENERAL

GENERAL	A complete monitor / analyzer system including automatic sampling (pump etc), detector, calibrator, computer hard ware and software for data display, acquisition (in excel format), data processing and instrument control for selective determination of volatile compounds in ambient air optimized for Benzene, Toluene, Ethyl benzene and o,m,p – Xylenes. Compatible to power supply (voltage 230 volts ±10 volts AC and 50 Hz ±3%). Continuous un attended measurement of individual BTX samples. Software should have inbuilt facility for customized averaging period (1hr/4 hr/8 hr/ 12hr/ 24 hr/ monthly/annual mean values). System should work without cryogenic cooling. System should have protocol compatible to communicate & transfer data to main computer / website through modem. Raw data storage capacity without erase minimum for three months or more.

2.0 TECHNICAL SPECIFICATIONS

2.1 Automatic Sampling (Monitor)	Analytical instrument / pump (single stage membrane) monitoring or automatic sampling, concentration of the organic compounds on an adsorption trap. Subsequent sample injections by thermal desorption and separation by wide bore capillary gas chromatography. Sample volume controlled by thermal mass flow controller (dust protected). The sampled volumes of air should be controlled by a calibrated sampling loop. Sample flow range may be 20 - 100 ml / min or more (adjustable). Sample volume should be between 400 ml – one litre or more of ambient air over a 10 -15 min sampling cycle and about equal time for analysis. All sample transfer tubing's should be in stainless steel. The flow / pressure sensor to be preferred with digital display.
2.2 Sampling Trap	Light weight stainless steel mini trap containing selective adsorbents (active charcoal or carbotrap or tenax G.R. or chromosorb 106), integrated heating element and temperature sensing by thermocouple, operating temperature range 40 – 200 ^{o}C or so.

2.3 Heating Oven	Metal oven having space for installation of wide bore capillary column, precolumn and temperature sensor. Operating temperature 40 – 100 ^{o}C or so that high resolution, stability and reproducibility is obtained for analyte of interest (BTEX)
2.4 Columns	Approx. 5 m pre column (for back flushing) followed by an approx. 10m – 50m length analytical column (higher length to be preferred). Both columns capillary (0.22 mm – 0.32 mm i.d. or / and wide bore i.e. 0.53 mm i.d.) coated with suitable column packing capable of separating all analyte of interest (i.e. 94-95% dimethylpolysiloxane & 5-6% cyanopropyphenyl or CP WAX 52 /DB5/624 or equivalent), film thickness between 1 and 2 µm. Should guarantee high resolution, stability and reproducibility.
2.5 Detector	Type : Photo Ionization Detector [PID] PID Lamp eV : 10.6 eV Lowest detector limit : 0.1 µg/m^3 (0.03 ppb) for Benzene Detector Diagnostics : PID sensitivity sensor / check facility
2.6 Operating Conditions	Temperature range : 5 – 35 °C or ore Concentration Range : 1 – 1000 µg/m^3 (0.3 ppb to 270 ppb) Repeatability : Retention time - < 0.1 % RSD Amount - < 1.0 % RSD Typical Cycle Time : Total Cycle time – 15/30 min. Approx Sample collection Time - 15 min. approx. Analytical Time – 15 min. approx.
2.7 Calibration Unit with Span Gas / Permeation Tubes and gas mixing / Dilution Facility	The certified permeation tubes, span or calibration gas mixture (low conc. range) with S.S. container / cylinder, regulators & filters. With calibration unit having gas flow (approx): 10 ml / min (calibration gas) ; 1.4 – 2.0 lit/min (dilution gas). Auto gas selection option for automatic calibration for ppb level calibration gas (10 – 30 ppb of individual compound of interest). Dilution device for calibration gases. Manual and software selectable valves for sample, calibration span and blank zero air gases. Dilution factor between 1:50 to 150.
2.8 Gas Supply & Control	Mass Flow controller and pressure regulators with pressure gauge for carrier gas. Inlet pressure regulator with pressure limit switches for all necessary gases. Needle valve with quick shut off valves for zero air.
2.9 Memory and Control Facilities	Method auto load and system restart after power failure. Methods storage capacity with timed events programmes

	for control of system parameters and valves in permanent memory. Busy (operational) status; calibration / sample gas selection. Fault status: gas supply (low press). Detector signal (low) and communication errors. Status indicated on monitor by LED's & controlled from computer. Output signals: Analog 0 – 1 mV, Serial RS 232 for data intermission and CP – BUS for monitor control from remote. Both digital & analog outputs should be available.
3.0 SOFTWARE	Window based latest software's (English version) consisting instrumental control features as well as data acquisition, processing and handling in desired format including sorting of data (1/4/8/12/24 hourly, days wise / date wise reporting as micro gram /m^3) or ppb (selectable) & averaging etc.). Software should have following features: In-built facility for customized averaging period (1hr/4hr/8hr/12hr/24hr/monthly/annual mean values), Data presentation / graphical & statistical processing & data transfer & storage facility to Excel / access. Communication software with protocol compatible to communicate & transfer data from BTX monitor to central computer / website through modem (preferably including sample chromatogram). System should have remote access to BTX monitor. Resident program as well BTX control / monitor user programme with monitor start up / off/status, blank / calibration and sample gas measured, fault status, carrier gas and communication errors indication. Updation of response factors automatically after calibration run. Updation of retention times after every sample analysis. Auto tune facility. Raw data storage capacity without erase minimum for three months or more.
4.0 Spares for 3 years	One set of each including columns, filters / traps for removal of dust & unwanted impurities (moisture / hydrocarbon); spare parts / electronic cards and sufficient septas, ferrules, dust filters, Teflon tubing etc & other consumables usually get exhausted during first 3 years of operation apart from one set as essential part with main instrument.
5.0 Installation & training	Free of cost installation & one week Training to concerned staff at MPPCB Laboratory.

Item Sl. No. 3

Bacteriological Incubator

Size (Inner chamber)	:	605x605x910mm (approx)
Temperature Range	:	Ambient to 70°C
Accuracy	:	±0.2°C
Timer	:	99hrs/cotinuous
Chamber/Body	:	Tripple wall construction. Inner Chamber made of stainless steel SS-304 grade & middle wall made of G.I. sheet. Outer body made of M.S. painted in epoxy powder with perforated adjustable SS shelve 03No.
Power Supply 50Hz/AC	:	220/230Volt Single phase,

- Air Circulatory fan should be provided for circulation of hot air in between inner chamber.
- Digital Temperature Controller cum Indicator
- Display: up to one decimal point
- Door with glass window should be provided.
- Wheel base should be provided.

Item Sl. No.4

COD Digestion Assembly

Specification:

Heating Block	Solid Metal block with 15 holes
Glassware	15 Reaction Vessels (Dia. 40mm approx.) and compatible Air Condensers
Temperature	150°C ±1% (uniform heating)
Capacity	15 samples at a time
Vessel Capacity	200 ml (without neck) for sample size 20 ml
Display	Graphic LCD Module 128 X 64 dots with large font
Key Board	Soft Touch membrane key board
Timer	Programmable Timer with Buzzer
Power requirement	230 V/50Hz, Single phase

Accessories to be supplied with the digestion assembly:

1. SS Holder for glass holding
2. Aluminium / Steel Stand for reaction vessel
3. Reaction Vessel [Borosilicate glass]
4. Aluminum /steel stand for Condenser
5. FRP Water Tank
6. Separately quote for compatible reaction vessel & condenser

Item Sl. No. 5

Columns for Gas Chromatograph [GC]

MS-5

Phase:		MS-5 (DB/ELIT/BP/RESTEK)
Dimensions:	L	30 meters
		ID 0.25 mm
		Film 0.25 mm
Temperature Range:		-60°C – 330°C/350°C

608

Phase:		608 (DB/ELIT/BP/RESTEK)
Dimensions:	L	30 meters
		ID 0.32 mm
		Film 0. 5 mm
Temperature Range:		40°C – 280°C/300°C

Item Sl. No. 6

DISSOLVED OXYGEN METR [HANDHELD TYPE]

Features	Water tight, impact resistant and corrosion resistant housing. Mains (230 ±10 volts/ 50Hz AC) through charging transformer and battery (rechargeable) operated, Built-in storage pocket for Dissolved Oxygen cell, Stand / carrying handle and shoulder strap.
Control	Microprocessor with functions automatically controlled
Modes	Mg/l, % - °C
Display	Mg/l, %: LCD 3½ digit; °C: 3½ digit, both at least 10 mm high.
Measuring Range	0.0 to 50 mg/litre; % saturation 0 to 600%
Accuracy	0.5% ± 2 digit of measuring value (0.01 level)
Temperature compensation	0 to 50 °C
Atmospheric Correction Pressure	Automatically by integrated pressure sensor
Salinity Correction	0 to 49% salinity
Temperature measurement range	0 to at least 50°C
Accuracy	0.2K ± 2 digit
Ambient Temperature	Up to 50 °C
Calibration	Should be automatic and precise in water vapour saturated air / in water, saturated with oxygen
Oxygen Electrode	Should be a membrane covered amperometric oxygen electrode, suitable for the measurement of DO up to 2 m depths, should be zero current free and pressure resistant. Should be provided with calibration and maintenance kit and storage holder.
Additional Items	System should be complete in all respect for D.O. measurement and should be provided with Funnel set, stirring accessory, Fixing ring, operational manual, dust cover, power cable, 2 meter electrode cord, charger for battery (230 ±10) V/ 50Hz and plug with spare and maintenance parts for 2 years of continuous operation

Item Sl. No. 7

Desiccator for PM $_{2.5}$ Sampler

Desiccator Cabinets for protecting humidity sensitive items specifically for filter papers of PM $_{2.5}$ Sampler. The cabinets are moulded of co-polyester plastic, resistant to staining, crazing and chemical attack. All the contents kept inside should be easily viewed through a large clear door that seals with positive latches and can be securely closed with seals. A dial hygrometer in the door allows for easy monitoring of relative humidity. Should work on 230±10VAC, 50Hz power supply.

Height	:	Approx 51cm
Width	:	Approx. 34 cm
Depth	:	Approx. 41cm
Internal Volume	:	Approx. 1.9 cu.ft

Item Sl. No. 8

Flue Gas Analyzer

Portable and advance type combustion [Flue] gas analyzer comprising of sensor, pumps, supply unit, electronics and key controlling panel. It should be handy and mobile for easy operation and record the measurement as CO_2, O_2, CO, SO_2, Temp., NO_2, NO, NOx, HC, Combustion efficiency, Excess air and other supporting parameter. The detail specification as below:

1.	Gases to be measured	CO, O_2, CO_2, SO_2, NO, NOx, HC and combustion efficiency
2.	Sensors	IR or Electro – chemical Sensors with high accuracy and life span of 3 to 5 years
3.	Gas Flow	1 to 2.5 Liter / min.
4.	Temperature Measurable	600˚C
5.	Operating Temperature	0 to 50 ˚C
6.	Power Supply	Battery [Long Life] operated along with in charger on mains 230V± 10VAC, 50Hz ± 3%
7.	Flue Gas Probe	Stainless Steel Shaft with rubber handle, length initially 01 meter and expandable up to 2 meters. The probe should withstand high temperature of the order of 600˚C
8.	Pre Programming	For Natural Gas, Light Oil, Heavy Oil, LPGs, Propane, Butane, Coke, Coal etc.
9.	Parameter wise specifications	Please see annexure- "A"
10.	Software/ operator	Easy to handle Key Board operated and user friendly, Data Format transferable to user software and print out facility
11.	Weight	Light weight /Portable with Qualitative Carrying Case,
12.	Certificate	Calibration and certificate of approval from recognized agency like EPA, TUV, NPL, NTSE be provided
13.	Documents	Instrument manual for operation, Circuit details for each electrode card for repair and maintenance.
14.	Calibration	Automatic

Annexure-"A"

Parameter	Sensor	Range	Resolution	Accuracy
O_2	Electro	0 to 25%	0.1%	±1% vol

	Chemical			
CO	Electro chemical	0 to 8000 ppm	1 ppm	<300 ppm = ± 10ppm Up to 2000ppm = = ± 4% <2000 ppm = +10%
CO%	Electro chemical	10%	0.01%	±100 ppm < 0.02% ± 5% rdg. Or 10%
NO	Electro chemical	0 to 4000ppm	1 ppm	<100 ppm = ± 5 ppm up to 3000 ppm = ± 4%
NO_2	Electrochemical	0 to 1000 ppm	1ppm	<100 ppm = ± 5 ppm up to 800 ppm = ± 4%
SO_2	Electrochemical	0 to 4000 ppm	1 ppm	> 100ppm = ± 5 ppm up to 2000 ppm = ± 4%
CO_2	Calculated	0 – 99.9%	0.1%	
CO_2	NDIR	0 – 200%	0.01%	± 3% rdg. Or ± 0.3 %
C_{XHY}	Pellistor	0 – 5.00%	0.01%	+ 5% F.S.
C_{XHY}	NDIR	0 – 50000 ppm	1ppm	± 3% rdg. Or ± 10 %
H_2S	Electrochemical	0 – 1000 ppm	1 ppm	
T-air	Pt-100	-10 to 99.9°C 14.0 – 212.0°F	0.1°C	± (0.2% rdg. + 0.15 °C)
T-Gas	TcK	0 to 999.9°C 32.0 – 1830°F	0.2°F	± (0.3% rdg. + 0.3 °C)
Δ T	Calculated	0 to 999.9°C 32.0 – 1830°F	0.1°C	(0.2% rdg. + 0.15 °C)
T_{flow}/T_{return}	TcK	-10 – 99.9 °C	0.2 °F	± (0.3% rdg. + 0.3 °C)
Pressure / Draft	Bridge	± 100h Pa	0.01h Pa	± 3 Pa <300 Pa , ± 1% rdg. >300 Pa
Excess air	Calculated	1.00 – infinity	0.01	--
Gas Velocity	Calculated	0 – 99.9 m/s	0.1 m/s	--
Efficiency	Calculated	1 – 99.9 %	0.1%	--
Auxiliary Inputs	2 channels	4 – 20 mA		--

Item Sl. No. 9

Orsat Gas Apparatus:

Technical Specification:

Orsat apparatus consists of a burette with 3 absorption pipettes.
Each pipette is controlled by separate glass stopcocks and all together with one.
In a hardwood carrying case with removable front and back panels.
One sample collecting bottle connected with Silicon Tubing.
Provision of opening from both sides.
Weight – 3.5 Kg approx.

Size (App.)	Length (In mm)	Breadth (In mm)	Height (In mm)
	300	120	500

Item Sl. No. 10

pH Meter [Pen Type]

General Characteristics:	Water tight, impact resistant corrosion resistant, housing, battery operated, pen or stick type
Calibration	Automatic with buffers
Modes	pH, Temperature
Display	LCD, 3 ½ digits
Measuring Range	0.00 to 14.00
Accuracy	± 0.1 pH
Temperature Compensation	Automatic for entire range
Measuring Electrodes	Combination electrode [built –in]

Item Sl. No. 11

PM $_{2.5}$ Sampler

The instrument should be tested with any accredited laboratories like CPCB, NEERI, IIT etc. Towards its compliance for USEPA norms. The instruments should possess following specifications.

Flow Rate	Fixed, 1M^3/hour [16.7 lpm] controlled by Mass Flow Controller
Elapsed time indicator	Up to 9999 hours with two decimals
Vacuum Pump	Diaphragm type, brush less motor
Flow Recorder	Chart type / Memory based downloadable to computer and/or manually displayed on screen.
Dry Gas Meter [Volume totalizer]	For measuring total volume of air sampled.
Volumetric Flow rate compensation	Ambient temperature and pressure sensors to control volumetric flow rate
Power requirement	230 ± 10 VAC, 50 Hz ± 3%
Size Selective inlets	Opposed jet impaction for PM10 cut and Cyclonic /WINS impactor for PM2.5 Cut off
Special Features	The system should have an option to be used for PM10 sampling
Calibration Unit	Calibration unit to calibrate the flow rate of the instrument
Additional supply	Manufacturers standard operation kit including all required items, fittings for start up / regular operation of instrument. Operation and maintenance manual for each unit. Spares and consumables for three year operation.
Optional Accessories	Pure Nylon membrane [1µm, 47mm] developed specially for acidic dry deposition measurements PTFE membrane filter with PMP [poly methyl pentene] support ring [1µm, 47mm] Pure Quartz filter [max. operating temp.> 1000^{o}C] 47mm

Item Sl. No. 12

STACK MONITORING KIT

General:

Stack Velocity	:	3 to 60 m / sec.
Stack Temperature Range	:	Ambient to 600 deg.C
Particulate Sampling	:	At 6 to 60 lpm
Filter Paper [Thimble]	:	Collection of Particulate down to 0.3 micron
Gaseous Sampling	:	At 1 to 2 lpm collection on a set of impingers containing selective reagents.
Pitot Tube	:	System should have facilities to connect accessories like heated probe system, cyclone separator.

Modified S- type pitot shall be fabricated from SS 304 or equivalent. The construction features should be as CPCB Doc. No. Emission Regulation [Dec. 1985] Part - II Calibration certificate from repute CSIR or IIT labs /Culcutta Test House should be provided for each pitot tube.

Sampling Probe: Fabricated from SS 304 tube of suitable diameter [not less than 15mm ID]. The lengths of the pitot tube and the sampling probes shall be decided between the users and the manufacturer.

Nozzles: A set of nozzles fabricated from SS 304 or equivalent material with internal diameter suitable to cover the full range of stack velocities. The leading edge of the nozzle should be sharp and tapered. The minimum internal diameter of the nozzle should not be less than 6mm

Thimble Holder: Filter holders fabricated from SS 304 suitable to hold cellulose/ glass fibre thimble.
Thermocouple: Thermocouple sensor with analog or digital dial gauge capable of measuring temperature from 0 to 600 ^{o}C covered with stainless steel or mils steel casing with acid resistant treatment.

Mounting Flange: A pair of male / female flanges fabricated out of mild steel with proper hole for mounting thermocouple sensor, sampling tube and pitot tube.

Panel Bos Sides: Backed stve - enamel finish. It should have suitable arrangement or housing stopwatch, manometer, rotameter, dry gas meter, etc.

Back panel: Hinged door panel of mild steel to contain cold box with 5 impingers or cold box can be provided separately.

Inclined - cum - vertical Manometer: Fabricated out of solid acrylic sheets/ blown glass. Inlet and out let provided at the end for filling in gauge fluid. Sprit level attached for leveling. Velocity range: 0 - 30 m /second.

Rota meter: 0 to 60 lpm for particulate monitoring and 0 to 6 lpm for gaseous monitoring.

Stop - Watch: 0 to 60 minutes, one second readout with hold facility.

Impingers: Four numbers of 120 ml and two numbers of 250 ml capacity. facility be there for keeping ice at the botton of impinger box.

Vacuum pump: Rotary design, with a capacity up to 120 lpm gas flow with single phase motor, 230 ± 10V. The pump will also have a moisture trap, air inlet valve and mounted inside a pump housing and should be portable.

Dry Gas Meter: The sampling train shall have a dry gas meter with the facility for measuring temperature and static pressure. The capacity of the meter should be adequate to record up to 100 lpm of air flow and a minimum readout of 0.001 cubic meters. Dry Gas Meter shall be suited for gaseous sampling rate also.

Pump Housing: Mild steel case with over-backed stove enamel finish and ON/OFF switch with indicator lights.

Tools: A kit containing the essential tools required for connecting various components shall be provided with the equipments.

Item Sl. No. 13

NOISE LEVEL METER

Measurement Range	should cover 20 – 140 dBA
Frequency weighting	Switchable to A, Linear, Octave and 1/3rd Octave
Accuracy	Min. IEC 804 (BS 6698) Grade I or ANSI Type I
Resolution	0.1 dB over full range
Display	Digital [Leq, SPL, Lmax and Lmin]
Time Weighting	Switchable to different time intervals i.e ⅛ Sec., 1 Sec., 10 Sec. etc. or slow, fast, max.
Power supply	Battery system
Computer Interface	Data Logging system with RS 232 interface
Calibration	Automatic Calibration
Temperature	0°C to 50°C
Memory	Sufficient memory to store at least 8 hrs. data for all parameters given in modes and octave band analysis.
Accessories Required	Calibrator [see specification], Microphone [spare, see specification], Tripod Stand, Wind screen, Batteries, Carrying Case or kit, Extension cable with pre amplifier

Specifications:

Calibrator:

Level (dB)	Two – one each in lower and higher range
Frequency	1khz.
Accuracy	± 0.3 dB at 25°C
Adaptors	25mm, 12.5mm, 6.25mm

Microphone:

Type	Premacharge air –condenser unit
Polarization Voltage	Not required
Response Type	Free Field 'O' degree incidence
Response Accuracy	min. IEC 651 type I
Operating Temperature	0 to 55°C
Range	20 – 140 dB(A)

1. Data Logger:

Communications with data logger should be possible using a standard RS 232 cable along with compatible modems in order to provide

communications facilities (Radio / Telephone). A Compatible software supplied with the data logger shall be able to handle all communication requirement.

2. **Further details / information required:**
   - Leq in bytes
   - Built in memory in bytes
   - Whether data logger in built in the unit or is a separate system
   - Details of software, in built/ spread sheet

3. **Whether the system is compatible for measurement of other parameters like meteorology.**

4. **Whether octave provided or not.**
   a) if yes; its range

5. **Whether the software has facility for :**
   - Retrieval of short (1sec.) leq elements
   - Post processing to produce Leq and Ln measurements over any period automatic event detection etc.

Item Sl. No. 14

SAFETY & PERSONAL PROTECTIVE EQUIPMENTS

1. **Self Contained Breathing Apparatus [SCBA]:** Carbon composite fiber cylinder, 7 liter 300 Bar for 45-60 minutes duration. Digital Pressure gauge, back light illumination, distress signal alarm, low pressure warning signal. Chemical resistant and height adjustable back plate. Weight of complete BA, face mask and back plate should be 10-12 Kgs.
2. **Chemical Resistant Hand Gloves:** Nitrile glove with tight grip in wet and oily environment, absorption resistant, blade cut resistant, tear resistant, puncture resistant. Butyl gloves, highly chemical resistant, protection against mustard agents, nerve gases, acids, alkalis, dioxins etc. Resistant to oxygenated solvents and most oxidizing chemicals, highest permeation resistance to gases and vapours.
3. **Chemical Boot:** Water Proof, built-in sponge insole, heavy canvas lining, steel toe cap, steel mid sole, heel tendon protection, electric shock resistant, heat and oil resistant sole, ozone and UV resistant.
4. **Chemical Protection Clothing:** Soft, light weight, suitable for working in static charge and explosive environment, liquid tight with ultrasonically welded seams, chemical resistant, flexible and abrasion resistant, Hood with acrylic visor, Colour – Yellow.
5. **Chemical Suit (level A & B):** Fully encapsulated Suit, Single piece, air and liquid-tight designed to work with SCBA, fully sealed hood with visor and exhalation valve, attached booties, chemical resistant. Colour – Green
6. **Chemical Agent Mask:** Made of high filtering efficiency, provided with exhalation valve, Aluminium adjustable clip and foam for increased comfort, elastic head band. Colour – White
7. **Full Face Mask with magic Canister:** Made of neoprene rubber, speech diaphragm, self demisting facility, inhalation and exhalation valve, provision for all types of canisters / multi range canisters for all toxic gases and chemicals.
8. **Safety Goggles:** Full vision goggle, can be worn over most prescription spectacles, wide and fully adjustable headband, optical polycarbonates lens, easy lens replacement, foam surround, flame retardant PVC, maximum IV protection, resistant to chemical splash, dust particles, molten metals and solids.
9. **Full Face Piece Respirator:** Gas mask with three filter ports, sufficient number of adjustable straps, heat and chemical resistant, polycarbonate visor.
10. Toxic Gas Filters
11. Safe Escape Hood
12. Chemical Agent Detection Paper
13. Emergency Blankets
14. Eye Wear and Ear muffs combo

Item Sl. No. 15

Turbidity Meter

The instrument should be micro processor based, Laboratory and portable, suitable for measurement even for coloured samples and with the following specification:

Display	2 Lines 16 characters LCD
Detector	Photodiode
Ranges	0 to 1000 NTU in four ranges [automatic] (a) 0-1 NTU (b) 0-10 NTU © 0-100 NTU (d) 0-1000 NTU
Accuracy	± 1.5% of FSD in 0 to 500NTU ± 2% of FSD in 500 to 1000 NTU
Repeatability	± 1% of F.S. [Std]
Calibration	Formazine Standard Solution
Data Storage	Calibration & Data stored in memory
Power Requirement	230 Volts ± 10 %, 50 Hz.
Accessories:	All necessary accessories to make instrument functional such as Epoxy – coated steel case, instruction manual, power cable and plug, dust cover, light shield, test tubes [25 mm diameter] [04 nos.] and stand.

Item Sl. No. 16

WATER ANALYZER

pH	Range	0 to 14 pH
	Resolution	0.01 pH
	Accuracy	± 0.01 pH
	Temperature Compensation	Auto with PT 100 sensor and manual
mV/ORP	Range	0 to ± 1999 mV
	Resolution	1 mV
	Accuracy	± 1.0 mV ± 1 digit
	Sensor	Combination electrodes
Conductivity /TDS	Range	0 to 100 mS, 5 ranges
		0 to 100 ppt 5 ranges at TDS factor 0.5 (approx)
	Accuracy	± 1% of FS ± 1 digit
	Sensor	Glass cell
	Temp. Compensation	Auto / Manual
Salinity	Range	0 to 40 ppt
	Resolution	0.1 ppt
	Accuracy	± 2% of FS ± 1 digit
	Sensor	Glass cells
Dissolved Oxygen	Range	0 to 20 ppm
	Resolution	0.1 ppm
	Accuracy	± 1% of FS ± 1 digit ± 0.1
	Sensor	Au/Ag Probe
	Temp. compensation	Auto / manual
Temperature	Range	0 to 100 deg.C.
	Resolution	0.1 deg.C.
	Accuracy	± 0.5 deg.C. ± 1 digit
	Sensor	PT 100
	Temp. compensation	Auto / manual
Colorimeter	Range	± 2.00 Abs., 0 to 100% T, Conc to 1999
	Resolution	0.001 Abs , 0.1 %T
	Accuracy	± 0.05 Abs
	Sensor	Photodiode
	Source	Tungston lamp
	Filters	Blue-440nm, Green- 540nm, Red- 660nm
Turbidity	Range	0 to 1NTU, 0 to 10 NTU, 0 to 100 NTU
	Accuracy	± 2% of F.S.
	Sensor	Photodiode
	Source	Tungsten Lamp

Accessories: All necessary accessories to make the equipment functional such as fiber briefcase, instruction manual, power cable and plug, test tubes, electrodes and stand etc. Power: 230 Volts, 50 Hz, ± 10% or internal battery with charger.

Item Sl. No. 17

Weather Monitoring Station

WIND DIRECTION	The sensor to provide low starting threshold, fast response and accuracy over a wide operating range in adverse environmental conditions. Specifications are as follows: Accuracy : ± 4% Wind Direction Operating Range : 0 – 360 Starting Threshold : 0.5 m/s Distance Constant : 1.1 m or air maximum Damping Ratio :0.4 at 10 initial angle of attack Temperature operating range : - 10°C to 60°C
WIND SPEED	The anemometer to provide a low starting, wide dynamic response and high accuracy over a wide range of wind speeds and a variety of environmental conditions. Specifications are as follows: Maximum Operating range : 0 – 50 m/s Distance constant : Vinyl : 1.5 m of air maximum Stainless Steel : 2.4 m of air maximum Heavy duty : 3.0 m of air maximum Temperature Range : - 10°C to 60°C Accuracy :0.2 m/s or 1%, which ever is greater Impedance : 4.7 k ohm Power Requirement : 12VDC, 4.5 mA or 6VCD at less than 1 mA
AMBIENT TEMPERATURE	Temperature measurement system specifications are as follows: Calibrated temperature range : - 10°C to 60°C Response : 10 seconds in still air Linearity : ± 0.1°C Accuracy : 0.15°C
RELATIVE HUMIDITY	Specifications are as follows: Measuring range : 0 to 100% RH Accuracy : ± 1.0 % [5 – 95% RH] Response Time :< 2 minutes for RH 10% to 90% < 5 minutes for RH 40 To 90% Typically 10 seconds Linearity : Better than ± 2% Reproducibility : 0.5% Temperature Range : - 10°C to 60°C

SOLAR RADIATION	The detector should be able to measure short – wave radiation which comprises the direct component of sunlight and the diffuse component of skylight. Specifications are as follows: Sensitivity : 80 micro amps per 1000 W m^2 Temperature dependence : 0.15 % per °C Max. Response Time : 10 microseconds Linearity : 1% from 0 to 3000 watts m^2 Cosine Response : Corrected up to 80 angle of incidence Orientation : No effect on instrument performance Calibration : Calibrated against an Eppley Precision,Spectral Pyranometer [PSP] under natural day light conditions. Absolute error under these conditions is 5% maximum, typically – 3%
RAIN FALL	Measuring Range : 0.2 mm to 100 mm/hr Accuracy : ≤ 0.2mm or 1% for ≤ 50 mm /hr, 2% for > 17.50 mm/hr Temperature Operating Range : -10°C to 60°C

SPECIFICATION OF DATA LOGGER: Data Logger with 8 analog and 24 digital inputs. Ability to log channels at different intervals and should have capability of averaging and displaying real time data and averaged data over a period of 1 min., 10 min., ½ hr, 1 hr, 4hrs, 8 hrs, 24 hrs, 1 month and year. Communication between data logger and computer using standard multi drop RS 232 Connector. The data logger should have internal battery with charger. The data logger should support PSTN line or GSM modem for data transfer.

SOFTWARE FOR DATA ANALYSIS: Software should be compatible to Window XP. For analysis like averaging for different timings including daily and monthly averages, plotting diurnal variation and daily variation, making wind rose.

Annexure : 5

LOCATION WISE DISTRIBUTION [LABORATORY EQUIPMENTS]

Sl. No.	Name of Equipment	Shahdol	Gwalior	Rew	Ind.	Bpl.	Amlai	Katni	Chhindwara	Pithampur	ERC, Bpl	Ujj.	Jbp.	Satna	Dhar	Cen. Lab., Bpl	Guna	Sagar	Singrauli	Tot. Qty.
1.	Atomic Absorption Spectrophotometer[GTA /FLAME / VGA]	--	--	--	--	--	--	--	--	--	--	01	01	--	--	--	--	--	--	02
2.	BTEX Analyzer	--	--	--	--	--	--	--	--	--	--	01	--	--	--	--	--	--	01	02
3.	Bacteriological Incubator	01	01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		02
4.	COD Digestion Assembly	--	01	--	01	--	--	--	--	--	--	--	--	01	--	--	--	--	--	03
5.	Columns for Gas Chromatograph	--	--	--	--	--	--	--	--	--	--	--	--	--	--	02	--	--	--	02
6.	Dissolved Oxygen Meter [Hand held]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	01	--	--	--	01
7.	Desiccator for $PM_{2.5}$ Sampler	01	01	01	01	--	--	--	--	--	--	01	01	01	--	01	01	01	01	11
8.	Flue Gas Analyzer	--	01	01	01	01	--	--	--	--	--	01	01	--	--	01	--	--	01	08
9.	Orsat Gas Apparatus	--	--	--	--	--	--	--	--	--	--	01	--	--	--	--	--	--	--	01
10.	pH Meter [Pen type]	02	02	02	02	02	--	--	--	--	--	02	02	02	--	02	02	02	02	24
11.	$PM_{2.5}$ Sampler	02	02	02	02	--	--	--	--	--	--	02	02	02	--	02	02	02	02	22
12.	Stack Monitoring Kit	--	--	--	01	01	--	--	--	--	--	--	--	--	--	--	--	--	--	02
13.	Noise Level Meter	--	01	--	01	01	--	--	--	--	--	01	01	--	--	01	--	01	01	08
14.	Safety Personnel Protective Equipment	--	--	--	--	--	--	--	--	--	01 set	--	--	--	--	01	--	--	--	02
15	Turbidity Meter	01	01	--	01	--	--	--	--	--	--	--	--	01	--	--	01	--	--	05
16	Water Analyzer	--	--	--	--	--	--	--	--	--	--	--	--	01	--	--	--	--	--	01
17	Weather Monitoring Station	--	--	--	--	--	01	01	01	01	--	--	--	--	--	--	--	--	--	04

Annexure – 6

CHECK LIST

ENVELOP "A"	Earnest Money of requisite amount and tender cost in case of tender document is downloaded from web site.
ENVELOP "B"	• Technical compliance details in Annexure "1" • Company Profile. • Leaf let / brochure of the applied item. • Copy of sales tax registration number. • Copy of PAN No. • Undertaking regarding not being blacklisted. • User's List & Performance reports etc. • Manufacturer's authorization certificate, in case the offer is not submitted by Manufacturer. • Commercial Terms & conditions
ENVELOP "C"	• Price schedule for Indigenous items in annexure "4" • Price schedule for Imported items in annexure "3" • Price schedule for AMC in annexure "2"