Pt.Ravishankar Shukla University, Raipur-492010 (C.G)
(School of Studies in Chemistry)

Tender Notice

No. 1034/chem/2019 Raipur, Date 10 /01/2019

Sealed tenders are invited from reputed firms/manufacturers/ authorized dealers for Ion Chromatograph, CHNSO, Analyzer, Automated Solvent Extraction System and Stability & Size Measurement Instrument along with accessories. Details of the tender and specification of equipment is available in the University website www.prsu.ac.in. tender should accompany two separate DDs for document cost Rs.2500/- and EMD@3% of the quoted amount.

Last date of Purchase of tender form	:	30 /01/2019, 05:00 pm
Last date of receipt of tender	:	31/01/2019, 03:00 pm by Registered post/Speed post only.
Opening of Tender	:	31/01/2019, 04:00 p.m.
Place of Opening Tender	:	SoS in Chemistry, Pt.RSU, Raipur (C.G.)

Registrar

Prof. M. K. Deb
Head
S O S in Chemistry
Pt. Ravishankar Shukla University
RAIPUR (C.G.)

ANNEXURE-I

TENDER FORM PART -I (TECHNICAL BID)

Part -I (Technical Bid) of Tender No	
Last Date for receipt :	
Due date for opening part -1 (Technical Bid)	
Bidders offer No	
Date :	
From :	
M/s:	
To	

Dear sir ,

I/we have gone through the tendering conditions to the tender and General Condition of Contract and Special Condition of Contracts contained herein with this tender documents. I/We herby agree to supply the stores confirming to the tender specification incorporated in ANNEXURE IV of the tender document and also agree to abide by your general condition of contract and special condition of contract contained in the tender document.

You will be at library to accept the items of stores offered by us and I/We shall be bound to supply you the stores as may be specified in the purchase order/contract.

I/We hereby to keep the price valid for your acceptance for a period of .....
From the date of opening of Part II (Financial bid) of the tender

I/We are also enclosing herewith all the leaflets catalogue etc. pertaining to the stores offered

Your faithfully

Stamp and Signature of bidder

ANNEXURE-II

TENDER FORM PART -II (FINANCIAL BID)

Part -II (Financial Bid) of Tender No	
Last Date for receipt :	
Due date for opening part -II (Financial Bid)	
Bidders offer No	
Date	
From	
M/s	
To	

Dear sir ,

In response to your invitation and as per your tendering and contracting condition, the prices applicable for the scope of supply contained in part-I (Technical bid) of our tender indicated in the format to this tender

I/We hereby to keep the price valid for your acceptance for a period of .....From the date of opening of Part II (Financial bid) of the tender

Your faithfully

Stamp and Signature of bidder

ANNEXURE-III

CERTIFICATE FROM THE VENDOR STATING THAT THE COMPANY HAS NOT BEEN BLACKLISTED BY ANY GOVERNMENT ORGANIZATION

To:

The Registrar

Pt. RavishankarShukla University

Raipur -492010

Chhattisgarh

Dear Sir,

This is to certify that M/s .....has not been blacklisted by any Government Organization at the time of submission of the tender document or before.

Yours Faithfully,

Authorized Signatories

(Name & Designation)

Date:

For and on behalf of M/s.....

Nate: This letter of authority should be on the Letter-Head of the manufacturing concern and should be signed by a component person of the manufacture.

ANNEXURE-IV

MANUFACTURER S AUTHORIZATION FORM (MAF)

To:

The Registrar

Pt. RavishankarShukla University

Raipur -492 010

Chhattisgarh

Tender Reference: .....

Dear Sir,

We ....., who are stabilized and reputed manufacturers of ....., do herby authorize M/s .....(Name and address of the agent/Dealer) to offer their quotation, negotiate and conclude the contract with you against the above invitation for tender offer.

We herby extend our full guarantee and warranty as per terms and condition of the tender and contract for the equipment and services offered this invitation for tender offered by the above firm.

Yours faithfully,

.....Authorized Signatories

.....(Name and Designation)

Date:

For and behalf of M/s .....(Name of Manufacturers)

Nate: This letter of authority should be on the Letter-Head of the manufacturing concern and should be signed by a component person of the manufacture.

ANNEXURE-V

FINANCIAL OFFER (PRICE BID FORM)

To,

The Registrar

Pt. Ravishankar Shukla University

Raipur (C.G.) 492010

Dear Sir,

1. I/We .....submitted the bid for Tender No .....Dated.....for "Supply of Instruments "at Pt.Ravishankar Shukla University Raipur (C.G.)

2. I/We thoroughly examined and understood instructions to tenders, scope of work, terms & conditions of contract given in the tender document and those contained appendix of Terms & Conditions of contract and agree to abide by them.

3.I/We hereby offer to supply of Equipment's at the following rates. I/We undertake that I/We are not entitled to claim any enhancement of rates on any account during the tenure of the contract.

Description of item: -

S.No.	Description Item Specification of & (Model if any)	Qty. in Units	Unit Price in Rs.	Discount (%)	Excise Duty/ Custom Duty(%)	GST (%)	Octroi (%)	Total Price in Rs.

- **Delivery Mode:** Delivery at Pt.Ravishankar Shukla University, Raipur, at site only
- Total bid price should be inclusive of all taxes and levies, transport, loading, unloading etc.
- Warranty Period: .....
- Delivery Period: .....days.
- Quotation Validity Date: - Minimum 120 Days from the date of Submission of quotation/tender.

• Payment Term: Payment within 30 working days from the date of submission clearof bill with acceptance certificate from the concerned dept./Sect./MMD.

Sign of bidder: -_____

Date: - _____

Name of the bidder:-_____

Firm's Name:-_____

ANNEXURE-VI

BID/TENDER PARTICULARS

Name of the Supplier:

2 Complete address of the Supplier:

3 Availability of demonstration of equipment at PRSU,Raipur: Yes / No

4. Cost of the Tender enclosed: Yes/No [Please √] If yes,

a.) Name of the Bank_____

b.) Amount in (`)_____

c.) Demand Draft No. _____

5. Earnest Money Deposit enclosed: Yes / No [Please √] if Yes,

a.) Name of the Bank_____

b.) Amount in (`) _____

c.) Demand Draft No. _____

d.) Last Validity date of the enclosed DD _____

6. Communication details of the concerned contact person to whom all references shall be made regarding this tender enquiry. [NOTE: Any changes after submission of Tender documentskindly update PRSU,Raipur]

a.) Full Name:

b.) Complete Postal Address:

c.) Telephone No.:

d.) Fax No.:

e.) Mobile No.:

f.) E-mail:

g.) Website Address:

Note: - Demand Drafts must be complied with CTS 2010 standards prescribed by Reserve Bank ofIndia.

Annexure-VII

TENDER FORM

1) **Addressed to:**

Name of the Tendering Authority	Registrar
Address	PtRavishankarShukla University(PRSU) Raipur (Chhattisgarh)– 492010
Telephone	
Tele Fax	
Email	

2) **Firm Details:**

Name of Firm				
Name of Contact Person with Designation				
Registered Office Address				
Address of the Firm				
Year of Establishment				
Type of Firm **Put Tick( ) mark**	Public Limited	PrivateLimited	Partnership	Proprietary
Telephone Number(s)				
Email Address/ Web Site	Email:		Web-Site:	
Fax No.				
Mobile Number	Mobile:			
Certification/Accreditation/Affiliation, if Any				

3) The requisite tender fee amounting to Rs. _____/- (Rupees <in words>) has been deposited videDD/BC/receipt no. _____ dated _____.

4) The requisite EMD amounting to Rs. _____/- (Rupees <in words>) has been depositedVideBanker'sCheque/ DD No. _____ dated _____.

5) We agree to abide by all the terms and conditions mentioned in this form issued by the Empanelment Authority and also the further conditions of the said notice given in the attached sheets (all the pages of which have been signed by us in token of acceptance of the terms mentioned therein along with stamp of the firm).

Date:

Name & Seal of the firm: _____

Authorized Signatory: _____

General Terms and Conditions

1. The tender should be submitted in prescribed form downloaded from the university website **www.prsu.ac.in**. The cost of the tender forms will not be refunded in any circumstance.
2. The tenders for equipments mentioned above should be submitted in the form of t/c bids.
   a. Technical bid
   b. Financial bid

   The interested agencies/firms are advised to submit two separate sealed envelopes superscripted "Technical bid" and "Financial bid" both sealed envelopes should be kept in a third sealed envelope superscripted "Tender No..... TENDER FOR SUPPLY/INSTALLATION OF .....(ENTER NAME OF THE EQUIPMENT with serial number)" last date of submission, date of opening of technical Bid and Financial Bid as indicated above and should be addressed to the Registrar, Pt. RavishankarShukla University, Raipur, Chhattisgarh.

3. Envelope-I (Technical Bid) The vendor must submit the following documents in Envelope
   a. Detailed response to required technical/scientific specifications of demanded instrumental configuration along with literature/manuals of the goods/services to be supplied.
   b. Technical compliance statement with deviation, if any.
   c. Authorized partner/dealer/distributor certificate from the original manufacturer.
   d. Documentary proof in support of PAN, TIN,GST No. and Service Tax No.
4. Envelope-II (Financial Bid) The vendor must submit the price Bid information mentioning all taxes/duties, For university campus, Raipur in the prescribed proforma Annexure-II. The price should be quoted in words and figures, without any errors or alterations.
5. Each tender should be accompanied by two separate demand draft
   a. Tender Document cost
   b. EMD @3% of the Quoted amount

   Drawn in the favour of Registrar, Pt. RavishankarShukla University, Raipur, payable at State Bank of India, RSU branch.

6. Late and Incomplete tenders and tenders without EMD, tender fee will not be accepted.
7. Firms which are exempted from the payment of EMD should furnish attested copy of the currently valid certificate to that effect issued by the competent authority.
8. Firm should submit minimum three supply references supplied to other Universities/ Institutes/ Govt. organization/ R&D Labs. Should provide supplied equipment details/ Name of the Organization, contact person name and mailed and contact numbers.
9. Firms having local sales and service support with trained service engineers to offer both emergency &warranty service support within short notice time.
10. All items should have original Test Certificate & warranty certificates with clear mention of item Serial No., Model No., Year of manufacturing etc. from original manufacturing company.
11. You are requested to confirm that in the event of firm is selected for placement of order; your firm will provide warranty from OEM (Original Equipment Manufacturer) of all components/ sub-systems and certificates of materials from supplier that will be used in the equipment.
12. Bidders response (in YES or NO) to each and every point of demanded configuration is must.

13. The cost of the equipment and all associated accessories of demanded configuration should be inclusive of all taxes, statutory levels, labour/ installation charges, packing, insurance, freight etc. All firms should quote FOR Pt. Ravishankar Shukla University, Raipur. Maximum educational discount for University as could be offered should also be mentioned.
14. The warranty period for the equipment should be for a minimum period of **Three Years** from the date of installation.
15. The exact specification, details of make, model, name of manufacturer, warranty details etc. of the item must be clearly specified. Original broachers with detailed technical literature and illustrations of the units quoted are to be attached with the offer. Details of trainings offered, warranty, maintenance service contact offered after expiry of normal warranty, spare parts availability and after-sales-service facilities available should be indicated. Offers without these are liable to be rejected.
16. For those bidders submitting tenders for more than one instrument, must submit Technical Bid and Financial Bid separately for each instrument and must be placed in individual sealed envelopes and these envelopes must be placed inside a bigger envelope. Only one model can be quoted in a tender.
17. The quoted rate should be valid for a period of 90 days.
18. The article to be delivered & installed within 30 days from the issue of P.O.
19. Successful bidder on confirmation of the tender will have to furnish a performance security of 10% of the total cost of the equipment and execute an agreement in Chhattisgarh stamp worth Rs. 100/-
20. Any delay in supplying the article from the stipulate date of delivery, will attract LD, Liquidated Damage will be applicable at the rate of 0.5% per week and limited to 10% maximum. The authority reserves the right to cancel the purchase order when LD accumulates to 10%.
21. GST will be paid extra, only if the specified taxes do not fall in the academic institution/universities certain tax exemption provisions released from time to time by central government funding agencies.
22. Unsealed quotation will be rejected and quotation must be reached on or before the due date through Speed post/Registered Post only.
23. University reserves the right to accept or reject any quotation without assigning any reason thereof.
24. All disputes will be subjected to Raipur jurisdiction.

HOD

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TECHNICAL SPECIFICATIONS

AUTOMATED SOLVENT EXTRACTION SYSTEM (ASE)

Accelerated solvent extraction for extraction of organic compounds from solid and semisolid samples with liquid solvents by using conventional liquid solvents at elevated temperatures and pressures to increase the efficiency of the extraction process. It should be applicable for air particulate samples collected on glass fiber filter papers & PUF, soil/ sediment / sludge samples for analysis of volatiles & semi volatiles.

Increased temperature to accelerate the extraction kinetics, and elevated pressure to keep the solvent below its boiling point, enabling safe, rapid extractions. In addition, the pH- hardened pathway to allow the extraction of pretreated matrices.

Temperature/Pressure Range- temperatures (40–200 °C) and pressures (1500 psi or better). (medium size wide mouth containers/vessels to contain samples

ASE systems to meet the requirements for extraction under U.S. EPA SW-846 Method 3545A for Pressurized Fluid Extraction of base/neutrals and acids, (BNA), organophosphorus pesticides (OPP), chlorinated pesticides and herbicides, polychlorinated biphenyls (PCB), polychlorinated dibenzo dioxins (PCDD) polychlorinated dibenzofurans (PCDF), and diesel range organics (DRO).

The System should have the following built-in functions:

1. The extractor should use a combination of solvent(s) under set temperature and pressure conditions to perform rapid and efficient extractions.

2. Organic solvents as well as other polar or non-polar liquids to be used for extraction. Water should also be usable in the extractor and the extractor should be operated under various temperatures.

3. The extractor must be able to meet the specifications outlined in US EPA Method 3545A.

4. Extractor shall be capable of oven temperature control of up to 200° C and cell pressure control of 1500 psi or better. Extractor must have controls to prevent operation at excessive temperatures and pressures.

5. Oven: Auto-seal actuator places cell into oven and returns cell to tray after extraction. Temperature control: up to 200 °C. Vertical cell orientation with flow from top to bottom.

6. Specialized oven design ensures uniform heating and control of temperature for the extraction cell. This ensures uniform extraction from cell-to-cell and batch-to- batch.

7. Integrated solvent controller allows mixing and delivery of up to three solvents: Extractor must be able to extract one single cell and/or one rinse cell. In-line filtration and in-cell clean-up: Flow-through technology allows in-line filtration and in-cell clean-up.

8. Pump: Fluid delivery pressure: 10 MPa (1500 psi). Pump flow: 70 mL minute, Automatic pressure sensor and pressure relief during heat-up.

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9. Extractor shall have the ability to use 1mL, 5mL, 10mL, 22mL, 34mL, 66mL, and 100mL extraction cells.

10. Cells must be of hand closure type where no wrenches and mechanical tightening are required.

11. Extraction Fluid /Sensor: Compatible with a wide range of organic and aqueous solvents .IR sensors detect fluid level during extract collection.

12. Pneumatic Requirement: Air at 400–827 kPa (60–100 psi or better); N2 at 1034x–1340 kPa (150–200 psi)

13. Extractor shall have automatic pressure sensor and pressure relief during extraction cell heat up.

14. Extractor shall have built in fluid sensors that detect the fluid levels during the extract collection.

15. Extractor shall have automatic shut-off in the event of sensor failure.

16. Extractor shall have front panel control method editor, and method storage.

17. Extractor shall be able to house one solvent bottle.

18. Extractor shall allow extracts to be automatically filtered prior to collection in the vial.

19. The extract in the collection vial shall be cool enough for a technician to immediately take from the extractor and move to the next step in the process.

20. The extractor shall be able to accommodate either 60mL or 250mL collection bottles.

21. The extractor shall be capable of extracting acidified or basic samples with the use of a pH hardened pathway and pH resistant extraction cells.

22. The solvent pump should pump at least 70mL/minute.

23. LOCAL SUPPLY : N2 Cylinder with high pressure Regulator .

24. 25. Installation & Hands on Training: Installation & Hand on training should be arranged by the supplier on free of cost.

Training	Vendor has to give minimum of two week on-site training after the installation. One week offsite hands-on training to two Scientists/faculties/technicians/research scholars on various aspects like, operation & maintenance, software, calibration, analysis of anions, cations & other species, interpretation of results, etc. at manufacturers application

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	Laboratory in India.
Warranty & AMC	Three years Warranty to be offered from the date of fully installation and operations start. 7 years AMC to be quoted optionally, that starts after three years warranty period.
General Condition	1. The instrument and all its sub units should operate on 230 ± 10 volts 50 Hz power supply. The supply and installation UPS with compatible capacity along with all fittings should be included in the package. 2. All other local requirements including all required ultra-pure gases, gas cylinders, regulators, fittings, installation should be done by vendor 3. Branded Desktop computer with compatible to the instrumental software and printer should be supplied and installed by vendor 4. All other fittings, requirements and accessories to reach at the operating condition of the said instrument with real samples, and were missed in this specification sheet will be included in the package and will be supplied and installed by the vendor. 5. All the operation and maintenance manuals, circuit diagrams, application notes and application soft-wares to be supplied should be in English language. 6. The supplier / manufacturer should have Indian agent to provide after sales service. 7. The main unit and all the sub units of the instrument should be serviced by the Indian representative of supplier. 8. 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. 9. Comprehensive warranty with spares for 3 years from the date of installation of the instrument should be covered
Important	The successful bidder shall give an undertaking that the spares must be made available for 10 years from the date of installation. Compliance of specifications shall be authenticated by the manufacturer point by point.

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TECHNICAL SPECIFICATIONS FOR CHNS/O ANALYZER

Fully automated computer controlled element analyzer capable of rapid quantitative determination of elements viz. Carbon (C), Hydrogen (H), Nitrogen (N) and Sulfur (S) in wide array of organic matrices, soils, feed, plant samples etc. applications (Both Macro & Micro analysis with an option **of Multi-Mode Valve Control in the same system) and it should allow to reduce helium gas consumption by switching from helium to nitrogen or argon gas, when the instrument is in Stand-By Mode**. Option to add external software controlled functions for automated valve for gas sampling. The system should be upgradable to a FPD detector for trace sulfur analysis and options for coupling of Isotope Ratio Mass Spectrometer (IRMS) system (Preferably from the same make)

The instrument should have following features:

1. Handle variety of sample types like solid, liquid, volatile and Gas samples

2. It should be Built-in helium and oxygen pressure reducers and gauges preventing air diffusion into the pneumatic circuit, Combustion/reduction furnaces with electronic temperature control offering full compliance with the most demanding safety regulations. Oxygen determination in the same furnace is used in pyrolysis condition. Electronic Flow Control of helium or argon carrier/reference gas and oxygen gas.

3. Measuring Range: 0.01% (100 ppm) - 100% for solid samples & 1-10 ppm (low level) for liquid samples (using TCD Detector).

4. Sample size: 0.01 mg to 100 mg or more

5. Furnaces: Maximum temperature of 1100 °C with **15-years warranty** under standard operational conditions (It should be available in the Specification sheet)

6. Detector: Maintenance free Thermal Conductivity Detector (TCD) with **15-years warranty** under standard operational conditions (It should be available in the Specification sheet)

7. Analysis time: Less than 7 min for CHN and Less than 10 min for CHNS.

8. Auto sampler: Automatic loading of samples with 30 or more positions in a single tray

9. Software: Window based operating software controlling the instrument operations, recording data, performing calculations, diagnostic recording like leak testing and condition monitoring, and manage calibration procedures

10. Sample Analysis Kit **:** CHNS kits for 1000 samples analysis should be quoted

11. Gas requirements**:** Ultra high purity He and O_2 Gas cylinders- three each, Nitrogen/Argon Gas cylinder -two nos. And Regulator for one each (He, O2 &Ar). Gas Purification Panel with Filters for all the gases

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12. Branded PC with Laser Jet Printer (B/W) – 01 Set

13. Branded 5 KVA on line UPS with 30 Battery back-up– 01 Set

14. Consumables & Chemicals:

COPPER OXIDE -50 g, QUARTZ WOOL - 5 g, ELECTROLYTIC COPPER -80 g, VANADIUM PENTOXIDE - 1 g, Knurled Screws kit – 3, Universal Tin Containers (set of 100) – 01, Universal Tin Container mega box (set of 1000) – 01, Universal "soft" Silver Containers (set of 100) – 01, Forceps – 01, Spatula for Container Filling, Cleaning Device for Quartz Reactor – 01, Empty Quartz Reactor (set of 2) – 02 Nos.

15. Warranty: Three Year

16. Weighing requirement: **Micro analytical balance** (Metler /Sartorius) to be offered along with the system
17. Additional Requirements to be included in the package:
    a. Standard Reference Materials for all described cations, anions, organic components in this specifications
    b. Manufacturer's standard kit: Standard operation kit including all required items, fittings for startup / regular operation of instrument

Operation and Maintenance.

    c. Manual Operation and Maintenance: Manual for each unit
    d. Application note: Application note for anions and cations analysis in environmental, biological, geological, metallurgical and industrial samples.
    e. Methodology package: Comprehensive EPA methodology package software (CD-ROM) for environmental application.
    f. Service manual: Service manual with set of required tools for each system/unit: Spare parts catalogue; Trouble shooting charts.
    g. Operation kit: Operation kit including all required items, tubing, fitting for startup / regular operation of instrument.
    h. Spares and consumables: All spares and consumables for two years of operations should be quoted.

18. References: Vendor has to give at least 3 references in India where the quoted system is working satisfactorily

Training	Vendor has to give minimum of two week on-site training after the installation. One week offsite hands-on training to two Scientists/faculties/technicians/research scholars on various aspects like, operation & maintenance, software, calibration, analysis of anions, cations & other species, interpretation of results, etc. at manufacturers application Laboratory in India.
Warranty & AMC	Three years Warranty to be offered from the date of fully installation and

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	operations start. 7 years AMC to be quoted optionally, that starts after three years warranty period.
General Condition	1. The instrument and all its sub units should operate on 230 ± 10 volts 50 Hz power supply. The supply and installation UPS with compatible capacity along with all fittings should be included in the package. 2. All other local requirements including all required ultra-pure gases, gas cylinders, regulators, fittings, installation should be done by vendor 3. Branded Desktop computer with compatible to the instrumental software and printer should be supplied and installed by vendor 4. All other fittings, requirements and accessories to reach at the operating condition of the said instrument with real samples, and were missed in this specification sheet will be included in the package and will be supplied and installed by the vendor. 5. All the operation and maintenance manuals, circuit diagrams, application notes and application soft-wares to be supplied should be in English language. 6. The supplier / manufacturer should have Indian agent to provide after sales service. 7. The main unit and all the sub units of the instrument should be serviced by the Indian representative of supplier. 8. 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. 9. Comprehensive warranty with spares for 3 years from the date of installation of the instrument should be covered
Important	The successful bidder shall give an undertaking that the spares must be made available for 10 years from the date of installation. Compliance of specifications shall be authenticated by the manufacturer point by point.

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SPECIFICATION

ION CHROMATOGRAPH WITH ACCESSORIES

Suppressed Ion Chromatography system	**It should be application for analysis of environmental samples (particulates, acid rains, water, soils, solids etc.).** The suppressed Chromatography system for both anions and cations to be quoted must be latest and should have inert, metal free, nonmetallic PEEK (polyether ether ketone) fluidic components throughout the system to ensure solvent compatibility and metal contamination-free chromatography. For the application of **Fe (Ferric Fe3+/FerrousFe2+) Cr (Trivalent CrIII/CrIV Hexavalent) As (Arsenite As3+ and Arsenate As 5+) Se (Se IV/VI), Iodine, S(species),** Thiols, Amines, cyanide, peroxide, transition metals, Lanthanides etc. The system should be compatible for both Hydroxide, carbonate, bicarbonate, MSA, H2SO4, oxalic acid etc. Power failure memory protection. Built in diagnostics for self-testing. Data acquisition and system control through software.
Solvent Delivery Pump	Ion Chromatograph with High Pressure Gradient Pump: **One set of two pumps for parallel analysis of cations and anions.** Computer controlled pumps (two nos.) for simultaneous/parallel analysis of anions & cations. It should be Dual piston pump. The pump must be made of a nonmetallic material to reduce the possibility of corrosion as a result of coming in contact with acid and base eluents that are common with ion chromatography operating at pressures of 6000 psi or better should accommodate 4um IC columns, compatible with reverse phase solvents. Manual injection port or user selectable injection loop. Internal pump for continuous automatic sampling and analysis. Safety feature: Safety features such as leak sensor with signal. Accessories: With maintenance kit, reservoir tray.
	• The flow range must be 0–10 mL/min or better without changing pumps in settable flow increments at 0.001 mL/min or better • Out let of the Pump should be free from any organic solvent with 100% • Flow Rate Precision < ±0.1% or better • Flow Rate Accuracy < ±0.1% or better • Should have RFID for consumables tracking & monitoring etc.
DETECTORS	**DETECTORS :** **a) ELECTROCHEMICAL DETECTOR (ED) :** The electrochemical detector must be capable of operating in an integrated amperometry, pulsed amperometry, or DC Amperometry mode. The cell electrodes must be available in the following options: gold, silver, platinum, and glassy carbon. Disposable electrodes must also be available made from the same material to provide ease of use. The reference electrode must be a pH-Ag/AgCl combination or Palladium Hydrogen (PdH), one piece design. Potential Range : -2.0 to 2.0 V in 0.001 V increments or better Cell Volume at Working Electrode : < 0.2 µL or lower

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	Suitable electrodes to be offered for arsenic, chromium speciation, Cyanide &sulphide,Thiols,amines,S(Sepecies) etc. **b) MULTI CHANNEL UV-VIS DETECTOR (Transition metals ,lanthanides & metal speciation) :** The variable wavelength detector and Post column reagent assembly is used for analytes that have no chromophore. Must have a wavelength range of 190-900nm settable in 1nm increments, with an accuracy of ±1nm. Must be a digital autoranging detector with a data collection rate of up to 100Hz. Flow cell must be composed of PEEK to prevent corrosion and increase durability. The compatible post column reagent assembly with accessories should provide to do Transition metals and chromium application in ppb level. Should also include a post column derivatization unit.
SUPPRESSION	System with a suitable Suppression technique device to reduce the background conductivity, enhance the conductance of the analyte of interest, and remove the counter ion resulting in increased signal. It must have the ability to perform gradients or isocratic runs without changing the device. • The suppressor must be operated continuously. • Suppressor regeneration must be carried out electrolytically without any external reagents or device should be available for both cations and anions. • Should have high loading and high back pressure tolerance with continuous regeneration
COLUMNS	Non Non Metallic/PEEK based Ion exchange column and its guard column compatible and suitable of 0-14 pH for the analysis of **Fe (Ferric Fe3+/FerrousFe2+) Cr (Trivalent CrIII/CrIV Hexavalent) As (Arsenite As3+ and Arsenate As 5+) Se (Se IV/VI), Iodine ,Cr III & VI ,cyanide , S (species) ,phenols amines,thiols,~~etc.~~** organic acids, etc.
SOFTWARE	The software must be able to provide full automatic control of the process of analyzing samples. This must include acquiring data, quantitation, producing a report, and the option to upgrade to an incorporated excels like spreadsheet for report flexibility. software should be 21 CFR Part 11 complied with audit trail and gradient curves optimization features. Application Software Control should be Multitasking software displaying method sample and analysis status, instrument control, reintegration/ report multi-level calibration. Calculation of data and report formatting Automatic correction of interferences and measurement with standards Comprehensive quality control protocols including blank, multiple quality control standards, calibration, and calibration failure with QA/QC audit trails. Provision for statistical analysis, printer / plotter function and battery backup for memory protection. System suitability, system security and system check functions such as calibration, quantitative analysis. Data retrieval, data acquisition and customizable instrument status display. Extractable data format and direct conversion to Excel spreadsheet through macro

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	1. Auto Dilution and Calibration: In built multi level calibration using single calibration standard. Auto dilution system should be automatic, programmable, should generate various concentration of standards from single standards and sealed calibration conc. 2. Filtration Assembly: Compatible filtration assembly complete with pump 45 mm, 0.22 µ pre size filter papers (500 Nos. i.e. 5 packets), filtration flask tubing, etc. **Additional Items to be included in package** 1. Standard Reference Materials for all described cations, anions, organic components in this specifications 2. Manufacturer's standard kit: Standard operation kit including all required items, fittings for startup / regular operation of instrument Operation and Maintenance. 3. Manual Operation and Maintenance: Manual for each unit 4. Application note: Application note for anions and cations analysis in environmental, biological, geological, metallurgical and industrial samples. 5. Methodology package: Comprehensive EPA methodology package software (CD-ROM) for environmental application. 6. Service manual: Service manual with set of required tools for each system/unit; Spare parts catalogue; Trouble shooting charts. 7. Operation kit: Operation kit including all required items, tubing, fitting for startup / regular operation of instrument. 8. Spares and consumables: All spares and consumables for two years of operations should be quoted.
References	Vendor has to give at least 3 references in India where the quoted system is working satisfactorily with seamless integration between the chromatography and the ICP-MS system with one software window. Specification of the offered system should be available on the manufacturer website.
Upgradable feature	Should be upgradable to seamless ICP-MS system or IC-MS detector system from the same manufacturer.
Training	Vendor has to give minimum of two week on-site training after the installation. One week offsite hands-on training to two Scientists/faculties/technicians/research scholars on various aspects like, operation & maintenance, software, calibration, analysis of anions, cations & other species, interpretation of results, etc. at manufacturers application Laboratory in India.
Warranty & AMC	Three years Warranty to be offered from the date of fully installation and operations start. 7 years AMC to be quoted optionally, that starts after three years warranty period.
General Condition	1. The instrument and all its sub units should operate on 230 ± 10 volts 50 Hz power supply. The supply and installation UPS with compatible capacity alongwith all fittings should be included in the package. 2. All other local requirements including all required ultra-pure gases, gas cylinders, regulators, fittings, installation should be done by vendor 3. Branded Desktop computer with compatible to the instrumental software

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	and printer should be supplied and installed by vendor 4. All other fittings, requirements and accessories to reach at the operating condition of the said instrument with real samples, and were missed in this specification sheet will be included in the package and will be supplied and installed by the vendor. 5. All the operation and maintenance manuals, circuit diagrams, application notes and application soft-wares to be supplied should be in English language. 6. The supplier / manufacturer should have Indian agent to provide after sales service. 7. The main unit and all the sub units of the instrument should be serviced by the Indian representative of supplier. 8. 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. 9. Comprehensive warranty with spares for 3 years from the date of installation of the instrument should be covered
Important	The successful bidder shall give an undertaking that the spares must be made available for 10 years from the date of installation. Compliance of specifications shall be authenticated by the manufacturer point by point.

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SPECIFICATION

Stability & Size measurement Instrument

A complete system should have the measurement facility for **Nano Particle Size, Zeta Potential (Aqueous, Non Aqueous) ,Molecular Weight** at variable temperature (0°C -90°C with 0.1 deg.c accuracy) with inbuilt Peltier temperature controller.

Description:

Particle size analysis (for any dispersions / emulsions / colloids / submicron suspensions):

(i) Principals: Dynamic Light Scattering **(Non Invasive Back Scattering detection is preferable)**

(ii) Minimum Particle size range (dia): Should be less than 0.40nm **(with sufficient documentary proof in terms of Analysis report or published journal)**

(iii) Maximum Particle size range (dia):Should be 9.0 µm or more **(with sufficient documentary proof in terms of Analysis report or published journal)**

(iv) Minimum sample required: Preferably less than 14µl.

(v) The instrument should be very sensitive, i.e. Toluene count should be more than 140kcps, also the photon count should be mentioned in the analysis report.

(vi) Should have a facility to measure long term trend analysis (continuous measurement of morethan 10000data with some fixed time interval) so that kinetics of growth as function of time/temperature, molecular size of clusters/large molecules can be determined.

(vii) Instrument should have automatic and manual measurement facility. Manual measurement should have facility of fixing measurement position with the cuvette and attenuator.

(viii) Sample Concentration: Minimum sample concentration around 0.1 mg/mL (of 15 to 20 kDa protein) &

Max. sample concentration around 40% w/v.

Zeta Potential

(i) Principals: Preferably by high & Low frequency micro electrophoresis, Laser Doppler velocimetry with

Phase Analysis light Scattering. .

(ii) Zeta Potential Range: Preferable more than +/-400mV or better.

(iii) Size Range suitable for measurement: Min: 5nm, Max: 90 micron

(iv) Maximum Sample Concentration: Preferably more than 35% w/v

(v) Maximum sample conductivity: Preferably more than 180mS/cm

(vi) Live measurement windows for display of Frequency, Voltage and Current, and Zeta potential vs Current.

(vii) Minimum sample volume: 20 microlitre

Molecular weight determination

Molecular weight determination: Should have facility to measure MW

Range of molecular weight – around 1,000Da to 2 x 10^6Da or better.

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Other Essential parameters for the quoted model:

- The instrument should have Dry Air purging facility to avoid condensation.
- Laser: Should be Class 1 type, preferably low power (less than 5mw, He-Ne Laser)
- Optics: Fixed Optics with automatic alignment prior to measurement.
- Auto initialization: Automatic.
- Correlator: should have more than 3900 channels
- Detector: Should be Avalanche Photo Diode Detector.
- Measurement time: should be less than 10Sec.

Software: Software should be suitable for running the equipment, data acquisition, data analysis, data transfer, graphical presentation etc. Vendor should also mention the key feature of the software.

- Should be compatible with Windows OS.
- Should have facility to create Standard Operating Procedure (SOPs) for better result quality & easy handling.
- Should have facility of Custom Report Generation for different application.
- Should have built-in library for RI with facility to insert RI for new sample.
- Should have built-in library for different solvent for selecting appropriate viscosity with facility to insert viscosity for new sample.
- Data representation should have facility to display Intensity wise / Volume wise / Number wise Particle Size Distribution and Statistics.
- Should have facility to **"see the correlogram", "over plot the results for direct comparison", "Temperature based trend analysis facility", "Time based trend analysis facility", "Crystal screening facility", "measure 2nd Viral Co-efficient", "Polymer Characterization facility", " measure/display of Zeta Potential, Electrophoretic Mobility, Conductivity, Temp, Formulation Stability"**

The Instruments should have a prohibition of the following features(Future Up-gradation facility at site):

- **Upgradation to Rheosizer:**
  System should have microrheology measurement unit compatible with the main equipment. The microrheology attachment should have the capability to determine the viscoelastic properties like
  (i) Storage modulus (G')
  (ii) Loss modulus (G")
  at different frequencies, Complex viscosity and mean square displacement of particles.
  Also the micro rheology apparatus should be able to give the correlograms relating scattering
  intensity against time.
- **Solid Surface Zeta Potential (Streaming Potential)**
  For the measurement of zeta-potential of solid surfaces e.g. silica, PEEK

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Support: (i) Remote access of the instrument (ii) Readily available complete service spare kit optical alignment on the fault identification and rectification. (iii) Vendor should have service facility in or around Bilaspur & Kolkata.

Essential accessories/items

(i) Suitable Computer and printer should be quoted along with the system.

(ii) Essential Cuvettes for the operation of the above system.

- Folded capillary cell, pack of 10 Polycarbonate with gold plated electrodes and 20 stoppers – 1 Box
- 12mm o.d. Square reusable Polystyrene 100 Cuvettes with 100 stoppers, 1.5 ml volume – 1Box.
- 12mm o.d Glass Cuvette – 1no.
- Low-volume quartz batch cuvette (12µl volume) for size measurement- 1no
- Ready to use Zeta potential Standard- 1syringe.

Installation/Demonstration/Application Training at site: It should be free of cost by the supplier.

Warranty: 1 year from the date of Installation.

User list: The supplier should submit complete user list highlighting the last 3 years (requested to highlight last three years user details in Eastern India).

Service Downtime:24 Hrs

Nearest Service Centre: Should be in or around Raipur & Kolkata.

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