



# Central University of Jammu

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Date: 27.07.2020

<p><b><u>Corrigendum – 01</u></b>  <b><u>Extension of Tender Submission Date with Minor Modification</u></b>  <b><u>Ref: - e-Tender No: 03/2020-21</u></b></p>
<p>Item: - Supply &amp; Installation of <b>Inductively Coupled Plasma Atomic Emission Spectrophotometer (ICP-AES) and Microwave Digester</b></p>
<p>1. Revised date and Time for Submission of e-Tender : 17/08/2020 ; 14.00 hrs</p>
<p>2. Revised date and time for opening of E-Tender (Technical Bid) : 17/08/2020 ; 15.00 Hrs</p>

## **Addendum- 01**

Particulars	Original Specifications	Modified Specifications
<b>ICP-AES System</b>	Inductive Coupled Plasma Atomic Emission Spectrophotometer (ICP-AES), bench top model, capable of analysing trace elements from ppb to percentage level in samples with diverse kind of matrix. System should be able to determine, major, minor and trace elements in single run measurement and have the following minimum specifications:	<b>No modifications</b>

<b>Sample Introduction system</b>	ICP-AES system should have integrated Sample Introduction system with minimum <b>four</b> channels peristaltic pump with variable speed from 0.2 ml to 7ml per minute or better with 0.1 ml/min or better for maximum flexibility. The sample introduction system including Nebulizer, Spray chamber, Torch, Injector should be made up of highly resistant to take care of various acids like HF, HCl, HNO <sub>3</sub> , HClO <sub>4</sub> etc.	ICP-AES system should have integrated Sample Introduction system with minimum <b>three or more</b> channels peristaltic pump with variable speed from 0.2 ml to 7 ml per minute or better with 0.1 ml/min or better for maximum flexibility. The sample introduction system including Nebulizer, Spray chamber, Torch, Injector should be made up of highly resistant to take care of various acids like HF, HCl, HNO <sub>3</sub> , HClO <sub>4</sub> etc.
<b>TDS capability</b>	ICP-AES system should allow analysis of samples with high TDS up to <b>3%</b> .	ICP-AES system should allow analysis of samples with high TDS up to <b>5% to 20% or better.</b>
<b>Gas flow control</b>	ICP-AES system should be equipped with electronic flow controllers for precise control of variable gas flow rate: • <b>Plasma gas Flow: 8-20 L/min in 1</b>	ICP-AES system should be equipped with electronic flow controllers for precise control of variable gas flow rate: <b>Plasma gas Flow: 8/10 - 20 L/min in 1 L/min</b>

	<p><b>L/min increment or better.</b></p> <ul style="list-style-type: none"> <li>• <b>Auxiliary gas Flow: 0-2 L/min in 0.1 L/min increment or better.</b></li> <li>• <b>Nebulizer gas Flow: 0-2 L/min in 0.01 L/min increment or better.</b></li> </ul>	<p><b>increment or better.</b></p> <p><b>Auxiliary gas Flow: 0.2 - 2 L/min in 0.1 L/min increment or better.</b></p> <p><b>Nebulizer gas Flow: 0.2 - 1.5 L/min in 0.01 L/min increment or better.</b></p>
<b>Spectrometer</b>	<ul style="list-style-type: none"> <li>• ICP-AES system should have capability to perform analysis in DUAL VIEW (both Axial and Radial modes) in a single method.</li> <li>• ICP-AES system must be equipped with <b>Double monochromators</b> for the best accuracy and precision with Fast Startup time and Low gas consumption.</li> <li>• ICP-AES system must be equipped Echelle-based optics and solid state detector thermo started at -15 degree Celsius or better.</li> <li>• ICP-AES system startup time should be less than <b>30 mins from cold/instrument switch off condition.</b></li> </ul>	<ul style="list-style-type: none"> <li>• ICP-AES system should have capability to perform analysis in DUAL VIEW (both Axial and Radial modes) in a single method.</li> <li>• ICP-AES system must be equipped with <b>Double monochromators/ Polychromator</b> for the best accuracy and precision with Fast Startup time and Low gas consumption.</li> <li>• ICP-AES system must be equipped <b>with Echelle/Paschen Runge</b>-based optics and solid state detector thermo started at -15 degree Celsius or <b>as per system hardware requirement.</b></li> <li>• ICP-AES system startup time should be less than 30 mins from <b>instrument standby mode and 60 mins or less from cold/instrument switch off condition.</b></li> </ul>
<b>Detector and wavelength range</b>	<ul style="list-style-type: none"> <li>• ICP-AES system should be equipped with solid state Charge Coupled device (CCD) Detector/Charge injection Device (CID).</li> <li>• The actual resolution (not the pixel resolution) of the system must be less than 0.009 nm at 200 nm or better.</li> <li>• The spectrophotometer must cover full spectral range from <b>165-840 nm or better.</b></li> <li>• The system should have capability to measure more than 10,000 emission wavelengths.</li> </ul>	<ul style="list-style-type: none"> <li>• ICP-AES system should be equipped with solid state Charge Coupled device (CCD) Detector/Charge injection Device (CID)/ <b>Composite metal oxide detector (CMOS).</b></li> <li>• The actual resolution (not the pixel resolution) of the system must be less than 0.009 nm at 200 nm or better.</li> <li>• The spectrophotometer must cover full spectral range from <b>167-770 nm or better range to cover all elements.</b></li> <li>• The system should have capability to measure more than 10,000 emission wavelengths.</li> </ul>
<b>Plasma View</b>	<ul style="list-style-type: none"> <li>• The system should include complete dual viewing optics under computer and software control.</li> <li>• Any wavelength needed can be used in radial, axial, mixed viewing modes or synchronous dual view in a single run.</li> </ul>	<p>The system should include complete dual viewing optics under computer and software control.</p> <ul style="list-style-type: none"> <li>• Any wavelength needed can be used in radial, axial, mixed viewing modes or <b>synchronous/simultaneous</b> dual view in a single run.</li> </ul>
<b>RF generator</b>	<ul style="list-style-type: none"> <li>• The system should equipped with solid state free running RF generator that should run at frequency of 27.12 MHz or 40 MHz with suitable power wattage adjustable from 1000 to 1500 watts or better in <b>1 watt</b> increment or better.</li> <li>• The power efficiency of RF generator should be greater than <b>81%</b> with &lt; 0.1% variation in output power stability.</li> </ul>	<ul style="list-style-type: none"> <li>• The system should equipped with solid state free running RF generator that should run at frequency of 27.12 MHz or 40 MHz with suitable power wattage adjustable from 1000 to 1500 watts or better in <b>50 watt</b> increment or better.</li> <li>• The power efficiency of RF generator should be greater than <b>75%</b> with &lt; 0.1% variation in output power stability.</li> </ul>

<p><b>Background correction and Spectral interference</b></p>	<ul style="list-style-type: none"> <li>• ICP-AES system should have the facility of online/simultaneous background correction.</li> <li>• The ICP-AES system must be able to read and apply manual or automatic spectral interferences correction in addition to background correction.</li> </ul>	<p><b>No modification</b></p>
<p><b>Startup and Gas consumption</b></p>	<ul style="list-style-type: none"> <li>• System should have the least total Argon gas consumption. (Please mention complete Argon consumption in L/min including Plasma, Auxiliary, Nebulizer, purging gas flows)</li> <li>• Any other gas required should be clearly mentioned and cylinders should be provided.</li> <li>• System should have the least warm up time. (Please mention time in minutes from switching off from main switch to the first sample aspiration. Three replicates after the first aspiration should be demonstrated with satisfactory repeatability to ensure stability of plasma and suitable warm up time.)</li> <li>• System should have the maintenance free provision to remove the tail plume of plasma.</li> <li>• The consumables/Spares required for next five years should be quoted for hassle free operation.</li> </ul>	<p><b>No modification</b></p>
<p><b>Hydride Generator</b></p>	<p>A Hydride generator kit for hydride forming elements like As, Hg, Se etc. should be included with the ICP-AES system.</p>	<p><b>No modification</b></p>
<p><b>Instrument Software</b></p>	<p>The instrument handling original software should be based on Windows 7/10 Professional installed on a Branded Desktop Computer with Eight Generation Core i7, 64 bit, 16GB RAM, 256 SSD, 1 TB HDD, USB 3.0 port (x6), Ethernet port, HDMI Port, 24" Full HD LED Monitor, Keyboard, Mouse and LaserJet colour printer. The instrument handling software must facilitate for:</p> <ul style="list-style-type: none"> <li>• Sample run and analysis status.</li> <li>• Instrument control reintegration/report, multi-level calibration,</li> <li>• Calculation of data and flexibility in report formatting.</li> <li>• Correction methods including intensity calculation drift correction, Blank</li> <li>• Correction, internal standard correction and overlap correction.</li> <li>• Quality control protocols including</li> </ul>	<p>The instrument handling original software should be based on Windows 7/10 Professional installed on a Branded Desktop Computer with Eight Generation Core i7, 64 bit, 16GB RAM, 256 SSD, 1 TB HDD, USB 3.0 port (x6), Ethernet port, HDMI Port, 24" Full HD LED Monitor, Keyboard, Mouse and LaserJet colour printer. The instrument handling software must facilitate for:</p> <ul style="list-style-type: none"> <li>• Sample run and analysis status.</li> <li>• Instrument control reintegration/report, multi-level calibration,</li> <li>• Calculation of data and flexibility in report formatting.</li> <li>• Correction methods including intensity calculation drift correction, Blank Correction, internal standard correction and overlap correction <b>(if applicable)</b>.</li> <li>• Quality control protocols including preparation blanks, multiple quality control standards, calibration, check samples, spike recoveries, duplicates calibration failure and QC limits.</li> <li>• Storage of complete spectrum of elements for</li> </ul>

	<p>preparation blanks, multiple quality control standards, calibration, check samples, spike recoveries, duplicates calibration failure and QC limits.</p> <ul style="list-style-type: none"> <li>• Storage of complete spectrum of elements for future reference.</li> <li>• Linear through zero, Linear Intercept, Weighted linear, Standard additions methods, addition calibration.</li> <li>• Software should be able to control other accessories like Hydride Generator Kit, Auto-Sampler and third-party accessories like Ultrasonic nebulizer, Auto Dilution systems and other Auto-Samplers.</li> </ul>	<p>future reference.</p> <ul style="list-style-type: none"> <li>• Linear through zero, Linear Intercept, Weighted linear, Standard additions methods, addition calibration.</li> <li>• Software should be able to control other accessories like Hydride Generator Kit, Auto-Sampler and third-party accessories like Ultrasonic nebulizer, Auto Dilution systems and other Auto-Samplers <b>(as applicable)</b>.</li> <li>• <b>Software technical compliance: Good manufacturing practice (GMP) and Good laboratory practice (GLP) or 21 CFR part 11.</b></li> </ul>
<p><b>Accessories</b></p>	<ul style="list-style-type: none"> <li>• Suitable Chiller re-circulator of appropriate capacity along with the system.</li> <li>• Operation and maintenance manual should be provided in both hard and soft copies.</li> <li>• Other accessories like Air compressor, Argon cylinders (4 no.s), nitrogen cylinders (no. 2) having suitable dual stage regulator and purification panels should also be included.</li> <li>• Suitable Fume exhaust system should be quoted.</li> <li>• System should come with all required accessories/spares for the smooth operation for minimum three years from the date of installation.</li> <li>• One additional sample introduction system including Nebulizer, Spray chamber, Torch, Injector made up of highly resistant to take care of strong acids like etc. should be supplied along with the system.</li> <li>• A suitable UPS of <b>15KVA with</b> 30 to 60 min. backup should be quoted.</li> <li>• Pre installation requirements- Complete technical details of pre installation requirement should be furnished along with the technical bid. Our institute will only provide the installation room, required electrical outlet and water connections.</li> <li>• Vendors are expected to supply all other accessories for installation and smooth operation of the equipment.</li> <li>• Suitable tool kit, spares and consumables kit is to be included in the order and the items supplied should be mentioned.</li> <li>• <b>5 year</b> from date of installation, against any kind of manufacturing defects. The warranty should be a part of the total ICP-AES system supply (including parts).</li> </ul>	<ul style="list-style-type: none"> <li>• Suitable Chiller re-circulator of appropriate capacity along with the system.</li> <li>• Operation and maintenance manual should be provided in both hard and soft copies.</li> <li>• Other accessories like Air compressor, Argon cylinders (4 no.s), nitrogen cylinders (no. 2) having suitable dual stage regulator and purification panels should also be included <b>(as applicable)</b>.</li> <li>• Suitable Fume exhaust system should be quoted.</li> <li>• System should come with all required accessories/spares for the smooth operation for minimum three years from the date of installation.</li> <li>• One additional sample introduction system including Nebulizer, Spray chamber, Torch, Injector made up of highly resistant to take care of strong acids like <b>HF</b> etc. should be supplied along with the system.</li> <li>• A suitable UPS of <b>suitable KVA required for</b> 30 to 60 min. backup should be quoted.</li> <li>• Pre installation requirements- Complete technical details of pre installation requirement should be furnished along with the technical bid. Our institute will only provide the installation room, required electrical outlet and water connections.</li> <li>• Vendors are expected to supply all other accessories for installation and smooth operation of the equipment.</li> <li>• Suitable tool kit, spares and consumables kit is to be included in the order and the items supplied should be mentioned.</li> <li>• <b>3 years</b> from date of installation, against any kind of manufacturing defects. The warranty should be a part of the total ICP-AES system supply (including parts) <b>and UPS + AMC for 2 years</b></li> </ul>

<b>Standards</b>	100 mL of Multi Element Standards (at least 20 or more elements) of 1000ppm each element with traceability certificate from competent agency containing transition elements, alkali elements, alkaline earth elements.	<b>No modification</b>
<b>Optional Items:</b>	Auto-Sampler: Suitable auto-sampler with vial capacity of 120 vials or more.	<b>No modification</b>

### Microwave Digester

<b>Purpose</b>	Primarily for acid digestion (with the combination of acids like HF+HNO <sub>3</sub> +HClO <sub>4</sub> etc.) of ambient aerosol samples collected on quartz microfiber filter papers to be used for analysis with ICP-AES or ICP-MS techniques.	<b>No modification</b>
<b>System</b>	Microwave digester with touchscreen display must be capable of processing <b>16</b> or more reaction vessels simultaneously with individual pressure active control on reference vessel with pressure rate increase control and direct temperature control on vessels.	Microwave digester with touchscreen display must be capable of processing <b>12</b> or more reaction vessels simultaneously with individual pressure active control on reference vessel with pressure rate increase control and direct temperature control on vessels.
<b>Vessel Specifications</b>	<ul style="list-style-type: none"> <li>• Volume of reaction vessel: 75 ml or more</li> <li>• Material of reaction vessel: Teflon (PTFE) Vessels</li> <li>• Operation temperature: <b>250 °C</b> or above</li> <li>• Vessel Operation pressure: 40 bar or more</li> <li>• Microwave Power: <b>1500 W</b> or better using microprocessor controlled single or dual magnetrons.</li> <li>• Microwave Digester should be compatible for 220-240 V and 50-60 Hz power supply.</li> </ul>	<ul style="list-style-type: none"> <li>• Volume of reaction vessel: <b>50</b> ml or more</li> <li>• Material of reaction vessel: Teflon (PTFE) Vessels</li> <li>• Operation temperature: <b>230 °C</b> or above</li> <li>• Vessel Operation pressure: 40 bar or more</li> <li>• Microwave Power: <b>1400 W</b> or better using microprocessor controlled single or dual magnetrons.</li> <li>• Microwave Digester should be compatible for 220-240 V and 50-60 Hz power supply.</li> </ul>
<b>Pressure and temperature control</b>	<ul style="list-style-type: none"> <li>• Pressure and temperature sensor of immersing type/probe/contact free for one reference to be included in the offer and the same should be provided of control using transducers and gas bulb respectively with wireless</li> </ul>	<ul style="list-style-type: none"> <li>• Pressure and temperature sensor of immersing type/probe/contact free for one reference to be included in the offer and the same should be provided of control using transducers and gas bulb <b>or suitable technique</b></li> </ul>

	transmission.	respectively with wireless transmission <b>or suitable feature as per system hardware requirement.</b>
<b>Software</b>	<ul style="list-style-type: none"> <li>• Built-in software with screen display for Temperature, Weight, Method Search, Power profile, Method set-up etc.</li> <li>• Software should have Built-in Cook-Book methods for various matrices</li> <li>• System must have control and graphic display for all routine operations.</li> </ul>	<b>No modification</b>
<b>Safety Features</b>	<ul style="list-style-type: none"> <li>• System should be equipped with safety interlocks.</li> <li>• System should have built-in integrated exhaust and cooling system for removal of fumes and gases (vapours) that ensues cooling of vessel without a use of external chiller/thermostat in less than 20 minutes</li> <li>• Over pressure should be released from the vessel to avoid any damage to the vessel.</li> </ul>	<b>No modification</b>
<b>Warranty</b>	System <b>and vessels</b> should have warranty for three years + AMC for two years	System should have warranty for three years + AMC for two years
<b>Other Accessories</b>	<ul style="list-style-type: none"> <li>• Additional one set of vessels.</li> <li>• Table to mount the instrument and accessories</li> <li>• Necessary cables and user manual for operation of the system.</li> <li>• Compatible on-line UPS (10 KVA or more) for 1 hour minimum back up from reputed company.</li> </ul>	<b>No modification</b>

All other terms and conditions of the above mentioned e-tender will remain unchanged. Further details and tender documents are available on our website [www.cujammu.ac.in](http://www.cujammu.ac.in) and <https://cujammu.euniwizarde.com>

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Deputy Registrar (GSW)