



# NAGALAND UNIVERSITY

(A Central University Established by the Act of Parliament No.35 of 1989)  
School of Agricultural Sciences & Rural Development  
Medziphema Campus – 797 106 (Nagaland)

NO.NU/SASRD/ADMN/A-22/2014- 4124

Date: 10.01.19

## NOTICE INVITING RATE QUOTATION

Sealed Rate Quotations are invited from interested Manufacturers/Dealers/Suppliers towards supply of scientific equipments to SASRD, Nagaland University Medziphema Campus. The envelop superscribed "RATE QUOTATION FOR SCIENTIFIC EQUIPMENTS" addressed to the Pro Vice Chancellor, SASRD, Nagaland University, Medziphema campus containing the Rate Quotations should reach the office of the undersigned latest by 31.01.2019 during office working hours. The list of equipments and detail specifications may be obtained from office during working hours or may be downloaded from N.U website [nagalanduniversity.ac.in](http://nagalanduniversity.ac.in)

SASRD, Nagaland University reserves the right to accept or reject any tender without assigning any reason whatsoever.

Sd/-  
(T.LANUSOSANG)  
Pro Vice Chancellor

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(T.LANUSOSANG)  
Pro Vice Chancellor

## EQUIPMENT SPECIFICATION FOR CENTRAL INSTRUMENTAL CENTRE, SASRD:NU

| SL No | Name of the equipment and detail specification  |
|-------|---|
| 1     | <p data-bbox="368 360 906 394"><b>Atomic Absorption Spectrophotometer</b></p> <p data-bbox="368 423 1445 495"><b>Supply, installation and commissioning of an Atomic Absorption Spectrophotometer system with the following specifications:</b></p> <p data-bbox="368 488 1445 580"><u>Optical True Double-Beam system with Facility of AUTOMATED changeover from Flame to Graphite Furnace ( for future upgradation) to avoid any mechanical movement of the set up while changing from flame to furnace mode (Including Auto sampler of GF)</u></p> <ul data-bbox="421 584 1445 1328" style="list-style-type: none"> <li>• <b>Wavelength range</b> : 185 to 900nm</li> <li>• Variable band width with automatic switching Nominal 0.1 (available below 400 nm),0.2, 0.5, and 1.0 nm spectral bandwidths</li> <li>• <b>Monochromator</b>: Echelle monochromator and prism <u>or</u> Grating with 1800lines/mm blazed at 240nm or so with <b>Reciprocal linear dispersion: 0.8 nm/mm at 200 nm or better.</b></li> <li>• Sensitivity: Minimum absorbance of &gt;0.95 Abs for 5ppm Cu (Copper) to be demonstrated &amp; available in literature/document.</li> <li>• <b>No. Of lamps mount</b>: Minimum 6 with simultaneous illumination of two (user selected lamps)</li> <li>• <b>Background</b>: Quad line (continuum source D<sub>2</sub>)BGC for flame as well as Zeeman BGC with Graphite Furnace ( for future upgradation)</li> <li>• Burner height: Automatic optimization of burner height</li> <li>• Fuel Flow: Automatic optimization of fuel flow</li> <li>• <b>Detector</b>: PMT [Photomultiplier tube] OR Solid State Detector (CMOS)</li> <li>• Titanium Burner head with 10 cm slot for Air-Acetylene flame and 5 cm for Nitrous Oxide-Acetylene flame</li> <li>• The burner height is to be automatically optimized</li> <li>• <b>Flame ignition</b> –Automatic.</li> <li>• <b>Nebulizer chamber</b>- An inert fluoroplastic spray chamber</li> <li>• Automatic gas control system.</li> <li>• <b>Data Coded Single Elements for</b>: Ca, Mg, Mn,Fe,B,Mo,Zn,Pb,Cr,Cd&amp; Cu &amp; all hollow cathode lamps to carry a 5000 mA/hr life period guarantee.</li> </ul> <p data-bbox="368 1368 1126 1402"><b><u>A variety of safety functions should be incorporated as below</u></b></p> <p data-bbox="469 1406 676 1435"><b>Safety measures:</b></p> <ul data-bbox="421 1440 1369 1872" style="list-style-type: none"> <li>• Software controlled, automatic oxidant changeover</li> <li>• Software controlled, automatic fuel gas boost on oxidant changeover</li> <li>• Automatic flame shut down</li> <li>• Fuel line flashback arrestor</li> <li>• Fuel line pressure regulator</li> <li>• Fuel and oxidant line pressure sensors</li> <li>• Flame present sensor</li> <li>• Burner type sensor</li> <li>• Power failure protection</li> <li>• Empty drain protection</li> <li>• Spray chamber over pressure protection</li> <li>• Safe ignition/extinction sequence, auto extinction on power failure, Gas pressure monitoring to prevent flashback</li> </ul> <p data-bbox="368 1877 868 1906"><b><u>PREREQUISITES should be incorporated as below</u></b></p> |

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|    | <ul style="list-style-type: none"> <li>• Suitable Branded Desktop Computer ( HP/DELL or Equivalent)</li> <li>• HP Laser Jet Mono (A-4 size) Printer</li> <li>• Acetylene Filled Cylinder For AAS analysis (UHP Grade) filled with gases, with necessary Tubing &amp; Connectors -2 Nos</li> <li>• Nitrous Oxide Filled Gas Cylinder for AAS application filled with gases, with necessary Tubing &amp; Connectors. -2 Nos</li> <li>• Double Stage Gas Regulators for Acetylene Gas Cylinder -1 No</li> <li>• Double Stage Gas Regulators for Nitrous Oxide with heater -1 No</li> <li>• Stainless Steel Double Hood with Exhaust Fan including necessary fitting and Ducting Facility -1 set</li> <li>• Gas Distribution Line for Argon</li> <li>• 3 KVA UPS with isolation transformer for 30 minutes back up</li> <li>• Certified Standard solution for AAS (1000 PPM) (each bottle of 125 ml.) for elements corresponding top lamps -1 Set</li> </ul>  |
| 2. | <p><b>HPLC SYSTEM</b><br/> <b>Supply, installation and commissioning of a high performance liquid chromatography (HPLC) system with the following minimum specification (better &amp; higher specification will be given preference) which can be upgraded to LC-MS/MS</b></p> <p>The HPLC system should include the following individual stackable self-contained modules with control software</p> <ol style="list-style-type: none"> <li>1. Organizer</li> <li>2. Solvent delivery system</li> <li>3. PDA detector</li> <li><b>4. 4-channel degasser</b></li> <li>5. Column oven</li> <li>6. Chromatographic software</li> <li>7. Suitable analytical and its guard column.</li> <li>8. Computer with Printer, UPS, Sample &amp; solvent filtration unit.</li> </ol> <p><b>Solvent Delivery System</b><br/> <b>Operating principle: Serial dual-piston in series.</b></p> <ul style="list-style-type: none"> <li>• Gradient Formation: Low-pressure gradient proportioning</li> <li>• Recommended flow rate range: 0.001–10 mL/min</li> <li>• Flow rate accuracy: <math>\pm 0.1\%</math></li> <li>• Flow precision: <math>&lt; 0.05\%</math> RSD or <math>&lt; 0.01</math> min SD, whichever is greater</li> <li>• Pressure range: 620 bar (290–9,000 psi) OR more for the entire flow range.</li> <li>• Pulsation Typically: <math>&lt; 0.2</math> MPa or <math>&lt; 1\%</math> whichever is greater</li> <li>• Solvent Delivery: 1-60 Step/<math>\mu</math>l (Programmable by Digital Pumping)</li> <li>• Proportioning accuracy: <math>\pm 0.5\%</math> (of full scale)</li> <li>• Proportioning/composition precision: <math>&lt; 0.15\%</math> SD at constant room temperature for stable RT</li> <li>• Compressibility Compensation: Pulse Dampner free system with SMART FLOW™</li> <li>• No. of eluent lines: 4 (Four)</li> <li>• Gradient delay volume: 690 <math>\mu</math>L</li> <li>• Solvent degassing: Built-in, 4-channels Internal Volumn</li> </ul> <p><b>Column oven</b><br/> <b>Column Compartment</b><br/> <b>Key Specifications:</b></p> <ul style="list-style-type: none"> <li>• Compartment Temperature Range: 4-90°C or 18°C below ambient temperature</li> <li>• Compartment Temperature Accuracy: <math>\pm 0.5</math> °C</li> <li>• Compartment Temperature Stability and Precision: <math>\pm 0.1</math> °C</li> </ul> |

- Compartment Heat-up and Cool-down Time: typically, 12 min
- from 20 °C to 50 °C, typically 15 min from 50 °C to 20 °C
- Switching Valves (optional): one or two switching valves: 2-position 6-port, 2-position 10-port, or 6-position 7-port valves
- Column Capacity: up to 12 columns
- Heating Cooling Type: Forced air circulations and peltier based.
- Large-area Peltier elements and a fan-based forced-air design to provide efficient and homogenous cooling and heating.
- PC Connection: all functions controlled via USB
- I/O Interfaces: two digital inputs, two relay outputs

User Input/Display: LCD indicating system parameters, standby button, three LEDs for status monitoring, four function keys for initial operation and maintenance

#### **Diode Array (PDA) detector**

- Key Specifications:
- Detection Type: Reverse optics design with concave holographic grating
- **Data Collection Rate: 100 Hz,**
- **Wavelength Range: 190–800 nm**
- Noise: Wide slit:  $\pm 8 \mu\text{AU}$  at 254 nm, Narrow slit:  $\pm 10 \mu\text{AU}$  at 254 nm; Response time: 2s (according to ASTM rime constant app. 1 s.) 4 nm bandwidth (water at 1.0 mL/min)
- Drift:  $< 1 \text{ mAU/h}$  (typically  $< 0.5 \text{ mAU/h}$ ) at 254 nm, de-ionized water at 1.0 mL/min
- Linearity:  $< 3\%$  RSD and corr. coeff.  $> 0.9995$  up to 1.5 AU, typically  $< 2.5\%$  RSD and corr. coeff.  $> 0.999$  up to 1.8 AU
- Light Source: deuterium lamp, tungsten lamp, temperature control for both lamps
- Wavelength Accuracy:  $\pm 1.0 \text{ nm}$ , self-calibration with D-alpha line, verification with holmium oxide filter
- **Pixel Resolution:  $< 1 \text{ nm}$  number of diodes 1024.**
- Slit Width: Narrow or wide slit
- PC Connection: All functions controllable by USB 2.0; integrated USB hub with three USB 2.0 ports
- GLP Features: Automatic Equipment Qualification (AutoQ), System Wellness Monitoring with Chromeleon software, lamp and cell ID chips
- User Input Display: LCD indicating system parameters, standby button LEDs for status monitoring four function keys for initial operation and maintenance

Analytical flow cell SST, 13  $\mu\text{L}$  volume, 10 mm path length

#### **Software**

Chromatographic data system with FDA compliance of CFR21 part 11 should be provided for the fully control of HPLC system.

Controls all the modules such as pump, column oven, DAD & for accessories to be added in future e.g Fluorescence Detector, RI Detector, Autosampler, Fraction collector etc.

Necessary LC software of same make of HPLC in original & all automated LC calculations facility should be available. Free up gradation of software during the warranty period & the **software should support gradient Programming of 1-9 different gradient curves for optimizing gradients**

#### **Column**

- Suitable C18 analytical column-250x 4.6mm x 5 micron -01
- Guard column and holder for the above

Rheodyne Manual Injector with position sensor and 20  $\mu\text{L}$  Sample Loop, & syringe

#### **Prerequisites required for the installation of the instrument**

##### **Desktop Computer Configuration:**

- 18.5" TFT Colour Monitor
- Processor Intel Core i3 6TH Generation Chipset OEM
- Memory 4GB DDR3 SDRAM (Upgradable to 8GB)
- Hard Disk Drive 500 GB SATA HDD; Optical Drive DVD Writer
- Ports I/O - (6) USB 2.0 ports, (1) serial port, (1) PS/2, (1) RJ-45, (1) VGA, (1) DVI-D, (1) line in, (1) line out, (1) MIC; Slots (2) full-height PCI slot, (1) full-height PCI-e x1 slots, (1) full-height PCI-e x16 Slot; Serial Port Card

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|   | <ul style="list-style-type: none"> <li>• Graphics On-board; Sound On-board;</li> <li>• LAN 1 x 10/100/1000; RS 232 Port; KBD &amp; Mouse HP</li> <li>• OS Win 7 Professional (License Version) – 64 Bit</li> <li>• Note: The latest version supplied at the time of delivery.</li> </ul> <ul style="list-style-type: none"> <li>• LaserJet Mono Printer Model 1020 Plus or Equivalent</li> <li>• 3KVA true online UPS System with 12V, SMF Battery with Battery rack &amp; Intercell connector to provide 30min. backup</li> </ul> <p>Sample &amp; Solvent filtration unit.</p>  |
| 3 | <p><b>Water Purification System</b></p> <p>Water purification system providing Ultra Pure Water from a potable water feed supply. Recirculation of purified water through wrap-around reservoir – to maintain consistent peak water purity</p> <ul style="list-style-type: none"> <li>• Front-entry service doors for easy access to consumables</li> <li>• Data collection capabilities through RS232 interface – for compliance with GLP guidelines</li> <li>• Biofilter pre-fitted- Option-Q produces water which is free from biologically active impurities. This makes it suitable for use with applications which require endotoxin free ultra-pure water, bacteria free water, and nuclease free ultra-pure water.</li> </ul> <p>The Option-Q15 is designed to deliver 15 litres of water per hour with a dispense flow rate of 1 litre per minute.</p> <p>Output rated for a feedwater supply at 15°C and 4 bar pressure.</p> <p>The system comprises pre-treatment, RO module, UV and deionisation.</p> <p>The purified water is re-circulated through the reservoir maintaining high quality water at all times.</p> <p>An installation kit, operator's manual and initial set of consumables are included with the system.</p> <p>System Performance:</p> <p>Inorganics: Up to 18.2MOhm/cm</p> <p>TOC (typical): 1-3 ppb (subject to suitable feedwater)</p> <p>Bacteria: &lt;1CFU/ml (with 0.2mm POU filter)</p> <p>pH: effectively neutral</p> <p>*Use of optional Biofilter will provide Endotoxin Specification and improved Bacterial Specification</p> <p>System Feedwater Requirements:</p> <p>Source: Potable water</p> <p>Maximum Fouling Index: 10</p> <p>Maximum Conductivity: 1400mS-cm</p> <p>Free Chlorine: &lt;0.5ppm</p> <p>Pressure (max): 6 bar (90psi)</p> <p>Pressure (min): 4 bar (60psi)</p> <p>Recirculation of product water throughout the reservoir.</p> <p>Full user microprocessor controls and alarms on water quality.</p> <p>Complete sanitisation.</p> <p>RS232 interface for GLP compliance.</p> <p>Consumables change reminder.</p> <p>Point of use Bio-filter==== One No</p> <p>50 Ltr Storage tank===== One No</p> <p>Pre filter Cartridge with boost pump=== One no</p> |