**Issued on: March 31, 2022**

**Addendum No 2**

**"PROCUREMENT OF EQUIPMENTS FOR ESTABLISHMENT OF QUALITY CONTROL AND ANALYTICAL LABORATORY" Under MBMA**

**RFB Ref. No: MBDA/BRDC/778/2021-22/586, Date of issue of RFB: March 10, 2022**

| Sl. No. | Clause Ref. | Original Clause | Amended Clause |
|---|---|---|---|
| **1** | ITB 22.1 | The deadline for the submission of bids is:<br>Date : March 31, 2022<br>Time: 1600 hrs. | **The deadline for the submission of bids is:**<br>**Date : April 21 , 2022**<br>**Time: 1600 hrs.** |
| **2** | B. Technical Specification | Section VII - Schedule of Requirements | **Kindly refer Annexure-I** |

***Sd/-***

**Shri. Jagdish Chelani , IAS**
**Executive Director, MBMA**

**Meghalaya Basin Management Agency**

**Annexure-I**

**1. ATOMIC ABSORPTION/EMISSION SPECTROPHOTOMETER (PAGE NO.76):**

| Sl. No. | Main component | Detailed specifications | Revised Specifications |
|---|---|---|---|
| **3.** | Monochromator | Focal length 250 mm or more. Preferably Czerny-Turner or equivalent monochromator with computer-controlled wavelength selection. | Suitable focal length echelle/ Czerny-Turner or better monochromator with dual atomizer. |
| **5.** | Grating | Holographic blazed grating with line density 1200 lines/mm or more. | Holographic blazed grating with line density 1800 lines/mm or 2D spectrum |
| **6.** | Dispersion | better than 2.3 nm/mm. | linear dispersion ≥06 nm/mm or better |
| **8.** | Background corrector | High intensity deuterium background corrector. Range 185-425 nm to 2.3 Abs. | High intensity deuterium background corrector. And Zeeman for graphite furnace |
| **15.** | Burners | Should be of inert material. Air/acetylene and nitrous oxide/acetylene burner to be offered.<br>Should provide external burner rotation. Should have facility for PC controlled burner adjuster with auto setting of burner height. | Universal burner for both. Air/acetylene and nitrous oxide/acetylene burner flame compatibility to be offered.<br>Should have facility for PC controlled burner adjuster with auto setting of burner height. |
| **18.** | Vapour Generation Accessory | It should be modular continuous flow or Flow injection type Vapor Generation Accessory for trace level determination of<br>elements like Hg, As, Se etc. at µg/L concentrations. Typical precision should be 1-2% RSD. | It should be modular continuous flow or Flow injection type Vapor Generation Accessory for trace level determination of<br>elements like Hg, As, Se etc. at µg/L concentrations. With integrated four channel mass flow controller. |
| **19.** | Lamps | Hollow cathode lamps: coded Single and multi-element hollow cathode lamps for analysis of various elements. The lamps should have. guaranteed 5000 mA hour of usage time. | Hollow cathode lamps: coded Single element hollow cathode lamps for analysis of various elements [Please mention the elements] . The lamps should have. guaranteed 5000 mA hour of usage time. |
| **20.** | Utilities/local supply | PC/Printer. Should be quoted with necessary gas cylinders, regulators, exhaust hood, compressor. | Accessories<br>Following accessories to be quoted with offered instrument:<br>• Branded Computer & printer to be supplied along with the instrument from the manufacturer with preloaded licensed version software.<br>• Fume Hood Exhaust system,<br>• Suitable 5KVA UPS with at least 30 min backup<br>• Suitable table for placing the instrument should be provided<br>• Argon gas cylinder (2 nos.)<br>• Acetylene gas cylinder (2 nos.)<br>• N20 gas cylinder (2 nos.)<br>• Gas manifold, etc. to be also supplied by the vendor along with all tubing<br>• Periodic mix standard / Multi-Element standards containing all elements of the periodic table, SRM and CRM of soil &sediment samples should be |

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| | | | provided for at least 1000 runs. |
| **21.** | Warranty | 1+ 2 years. AMC | 3+ 2 years. AMC |

**21. GAS CHROMATOGRAPHY (PAGE NO.87)**

| Sl. No. | Main component | Detailed specifications | Revised Specifications |
|---|---|---|---|
| 1. | Chromatography-Mass Spectrometer | GC with original licensed windows-based software and Split-Spitless capillary inlet along with one 15 vials liquid auto sampler. GC must be capable to accommodate at least two detectors & two injectors in working conditions simultaneously. Minimum retention time repeatability <0.06 % and Peak area repeatability <2 %must be there with the system. | GC with original licensed windows-based software and Split-Spitless capillary inlet along with one 8 vials liquid auto sampler. GC must be capable to accommodate at least two detectors & two injectors in working conditions simultaneously. Minimum retention time repeatability <0.0008 min <0.4 % RSD and Peak area repeatability must be there with the system. |
| 4. | Split/Split-less Capillary Inlet | Split/split less capillary port•<br>Temperature: 400 °C or more•<br>Fully EPC•<br>Split ratio: 6000: 1 or more•<br>Pressure setting range 0–100 psi• | Split/split less capillary port•<br>Temperature: 400 °C or more•<br>Fully EPC•<br>Split ratio: 10,000: 1 or more•<br>Pressure setting range 0–>145 psi• |
| 5. | Auto Injection facility | Injection range up to 100 ul.•<br>RSD of better than 0.3% RSD area reproducibility•<br>Vial capacity should be 15 or more.• | Head space sampler: Temperature range OFF or from ambient +5 to 300 °C, settable in 1 °C increments 12 vial incubation oven, 12 vial capacity. Typical area repeatability |
| 6. | Software | Original window-based software with license• | Original window-based software with license• |
| 7. | FID | Maximum operating temperature 425 °C or better•<br>MDL•<3 pg carbon/s as tridecane or better<br>Linear dynamic range•>$10^7$ or better<br>Maximum data acquisition rate 450 Hz or better•<br>Full range digital data path enables peaks to be quantified over the entire $10^7$concentration range in a single run.• | FID · Maximum operating temperature 425 °C or better ·<br>MDL : 1.2 pg carbon/s or better |
| 8. | TCD | Maximum operating temperature 400 °C•<br>MDL•<800 pg tridecane/mL or better<br>Linear dynamic range $10^5$• | **ECD Detector :**<br>• Radioactive source: 370 MBq equal to 10 mCi, 63Ni or better<br>• MDL: <4.5 fg/s lindane or better<br>• Linear dynamic range: >104 with lindane or better |
| 9. | Consumables | Vials and Caps- 5000•<br>EI Filament-1•<br>Liner- 10 each for split and split-less•<br>Ferrules- 10•<br>Column nut- 10•<br>Septa- 100•<br>Glass wool- 10•<br>Auto sampler syringe- 4• | Vials and Caps- 5000•<br>Liner- 10 each for split and split-less•<br>Ferrules- 10•<br>Column nut- 10•<br>Septa- 100•<br>Glass wool- 10• |
| 11. | Gas Cylinder | Zero Air, H2 and N2 Gas Cylinder, regulators with Gas purification panel.• | •True On-line 5 KVA UPS with 30 minutes battery backup<br>•UHP Grade Nitrogen Gas with Double Stage SS Diaphram Regulator-1 set |

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| | | | • UHP Grade Hydrogen Gas with Double Stage SS Diaphram Regulator 1 set ( FOR FID)<br>• UHP Grade Zero Air Gas with Double Stage SS Diaphram Regulator 1 set ( FOR FID)<br>• Suitable Laser Jet Printer –Qty 1<br>• Gas purification panel for all required gases 10 µL liquid -2Nos & 5ml Gas Tight Syringe -1 No |

**24 & 44. LIQUID CHROMATOGRAPHY & HPLC (PAGE NO. 88 & 97):**

| Sl.No. | Main Component | Detailed specification | Revised Specification |
|---|---|---|---|
| **2.** | **Liquid Chromatography** | **Pump: Must be gradient pump with 11500 psi pressure or better.•**<br>**Flow rate: Must be 0.001 - 5 mL/min in 0.001 mL increment or better•**<br>**Flow precision: Must be less than 0.075% RSD•**<br>**Flow accuracy: Must be better than 1%•**<br>**Delay volume ≤ 360 µL or better.•**<br>**The pump shall have a means within the method for th eon-line blending ofeluentstoaspecificpHbasedonexperimental pHcalibrationfilesthatarecreated by the user.•** | **Pump: Must be gradient pump with 15000 psi pressure or better.•**<br>**Flow rate: Must be 0.001 - 5 mL/min in 0.001 mL increment or better•**<br>**Flow precision: Must be less than•<0.05% RSD or better**<br>**Flow accuracy: Must be ≥0.1%•**<br>**Delay volume 360 µL-1000uL or better. (user selectable)•**<br>**The pump shall have a means within the method for the on-line blending of eluents to a specific pH based on experimental pH calibration files that are created by the user. pH range 2-12 with salt no buffer limitations.** |
| **5.** | **PDA/DAD Detector** | **Wavelength range: 190-950 nm or better.•** | **Wavelength range: 190-800 nm or better.• Resolution <0.7nm or better** |
| **7.** | **Software** | **Control software should be user friendly and should have all the features to fine-tune the Data in the analysis, which are required for calibration and quantification and validation of the methods. Facility for Automated solvent Blending, online pH, ionic strength &organic modifier blending from solvents must be present so as to attain a perfect pH without human intervention.** | **Control software should be user friendly and should have all the features to fine-tune the Data in the analysis, Gradient optimization curves 1-11 ( linear, exponential, convex, concave) with integrated relational database.** |
| **9.** | **UPS** | **Suitable 5 KVA online UPS with half an hour back up facility with 5 years warranty. Suitable table for system in the lab** | **Suitable 5 KVA online UPS with half an hour back up facility with 3 years warranty. Suitable table for system in** |

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| | | | **the lab** |

**77. INDUCTIVELY COUPLED PLASMA- MASS SPECTROMETER (PAGE NO. 111):**

| Sl. No. | Detailed specifications | Revised Specifications |
|---|---|---|
| **2.** | A peristaltic pump with >=10 rollers multi-channel (3 channel or more) which can support variable flow rates. | A peristaltic pump with >=10 rollers multi-channel (4 channel or more) which can support variable flow rates with integrated drain sensors. |
| **7.** | Three or more software controlled gas mass flow controllers or equivalent technology for control of plasma gas lines (nebulizer, plasma and auxiliary gas flow). Additional MFC for organic solvent usage should also available. | Three or more software controlled gas mass flow controllers or equivalent technology for control of plasma gas lines (nebulizer, plasma and auxiliary gas flow). Additional MFC for organic solvent usage should also available. Reaction gases compatibility (H2, O2, NH3, and mix gases etc)<br>Reaction Cell with mass cut-off feature. |
| **16.** | (A). Sensitivity specifications are as follows: (UOM): MCPS/ppm<br>9Be or Li: 5 or better•<br>115In or Y: 90 or better•<br>238U or Tl: 70 or better♣<br>(B). Detection limit : as follows<br>9Be or Li: 1 ppt or better•<br>115In or Y: 0.5 ppt or better•<br>238U or Tl: 0.5 ppt or better♣ | (A). Sensitivity specifications are as follows: (UOM): MCPS/ppm<br>9Be or Li: 5 or better•<br>115In or Y: 90 or better•<br>238U or Tl: 330 or better♣<br>(B). Detection limit : as follows<br>Detection Limits (ppt):<br>• 7Li (7): 0.5 or better<br>• In 115: 0.1 or better<br>• 205Tl/238U: 0.1 or better |
| **29.** | Speciation studies: The system should be capable of performing speciation studies of following ions: As, Cr, Hg, Se.<br>The columns (Two each) for speciation of As, Cr and Hg should be quoted.<br>An integrated /inbuilt LC-ICP-MS interface to be provided which should include quaternary pump , degasser, flow cells, column heater, speciation column for As, Cr, Hg, Se(two each ) with all required accessories. The full configuration of HPLC-ICP-<br>MS and transfer valve must be under one single software control. | Speciation studies: The system should be capable of performing speciation studies of following ions: As, Cr, Hg, Se.<br>The columns (Two each) for speciation of As, Cr and Hg should be quoted.<br>An integrated /inbuilt suppressed chromatography-ICP-MS interface to be provided which should include quaternary pump , degasser, flow cells, column heater, speciation column for As, Cr, Hg, Se(two each ) with all required accessories. The full configuration of HPLC-ICP-<br>MS and transfer valve must be under one single software control.<br>The speciation set up should be able to demonstrate chromium speciation from analysis. From 25ppt – to 250 Pt calibration with R2 > 0.99.<br>Literature should be provided DMA , MMA, and Inorganic As using speciation set up<br>The system must be able to perform chromium speciation using isocratic acidic mobile phase |
| **36.** | Items for installation requirement:<br>▪ Gas cylinders with regulators (minimum number of cylinders required are mentioned here): Argon - 08 Nos., Helium - 02 Nos., reaction gas cylinders: Methane/Oxygen/Hydrogen – 02 Nos. (min. two gas) as per system requirement to comply with all applications and regulations. Gas Panel as per requirement<br>▪ Manifold with four cylinder capacity for Argon. Gas line installation.<br>▪ Argon manifold for 4 cylinder with auto change over, | Items for installation requirement:<br>▪ Gas cylinders with regulators (minimum number of cylinders required are mentioned here): Argon - 08 Nos., Helium - 02 Nos.,<br><u>Reaction Cell Gases: Qty-1</u><br>Oxygen Filled Gas Cylinder (High Purity) in 47 Ltrs. Carbon Steel Cylinder with Valve, Valve guard, necessary Tubing & Connectors & Certificates; Gas Volume: 7.0m3<br>CCT Gas Mixture with Regulator (Required for Complex Samples) |

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| | valves, regulator and gas purification panel-01 no.<br>▪ Suitable exhaust fume hood assembly for both ICP-MS and microwave digestion system.<br>▪ Compact and low-noise chiller unit(s) as per manufacturer's recommendation. | Ammonia – 5 % + Hydrogen Balance in 47 ltrs C.S Cylinder with Valve and Valve guard<br>CCT Gas Mixture with Regulator (Required for Complex Matrix Food samples)<br>Hydrogen – 7% + Helium Balance in 47 ltrs C.S Cylinder with Valve and Valve guard<br>Gas regulators with all necessary connecters, regulators, valves and tubing for Argon, Helium, Oxygen, Ammonia& Hydrogen: One number each<br>▪ Manifold with four cylinder capacity for Argon. Gas line installation.<br>▪ Suitable exhaust fume hood assembly for both ICP-MS and microwave digestion system.<br>▪ Compact and low-noise chiller unit(s) as per manufacturer's recommendation. |
| | Inorganic Speciation standards and columns for As, Cr, Hg and Se.<br>▪ Auto-tuning standards.<br>▪ Single nanoparticles standards for Au and Ag (three concentrations each)<br>▪ ICP-MS Grade suprapure Acids: 5L Nitric acid, 5L Hydrochloric acid, 2 Ltr Hydrogen Peroxide, 4 Ltr Hydrofluoric acid.<br>▪ Suitable granite-top tables for ICP-MS & LC unit and desktop.<br>▪ Suitable online 20KVA UPS for a minimum backup for 1-2 hr(including MCBs, wires and all fittings etc.)<br>▪ 1.5 ton A.C with installation-2Nos<br><br>Vibration free table with granite top to keep the system and one separate computer table to keep the PC and printer | Inorganic Speciation standards and columns for As, Cr, Hg and Se.<br>▪ Auto-tuning standards.<br>▪ Single nanoparticles standards for Au and Ag (three concentrations each)<br>▪ ICP-MS Grade suprapure Acids: 5L Nitric acid, 5L Hydrochloric acid, 2 Ltr Hydrogen Peroxide, 4 Ltr Hydrofluoric acid.<br>▪ Suitable granite-top tables for ICP-MS & IC unit and desktop.<br>▪ Suitable online 20KVA IGBT UPS for a minimum backup for 1-2 hr(including MCBs, wires and all fittings etc.)<br>▪ 1.5 ton A.C with installation-2Nos<br>Vibration free table with granite top to keep the system and one separate computer table to keep the PC and printer |

**78. GAS CHROMATOGRAPHY-TANDEM MASS SPECTROMETER MS/MS (PAGE NO. 115):**

| Sl. No. | Main component | Detailed specifications | Revised Specifications |
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| 1. | Chromatography-Mass Spectrometer | GC with original licensed windows-based software and Split-Spitless capillary inlet along with one 15 vials liquid auto sampler. GC must be capable to accommodate at least two detectors & two injectors in working conditions simultaneously. Minimum retention time repeatability <0.06 % and Peak area repeatability <2 %must be there with the system. | GC with original licensed windows-based software and Split-Spitless capillary inlet along with one 100 vials liquid auto sampler. GC must be capable to accommodate at least two detectors & two injectors in working conditions simultaneously. Minimum retention time repeatability <0.0008 min <0.4 % RSD and Peak area repeatability must be there with the system. |
| 4. | Split Split-less Capillary Inlet | Split/split less capillary port•<br>Temperature: 400 °C or more•<br>Fully EPC•<br>Split ratio: 6000: 1 or more•<br>Pressure setting range 0–100 psi• | Split/split less capillary port Qty-2•<br>Temperature: 400 °C or more•<br>Fully EPC•<br>Split ratio: 10,000: 1 or more•<br>Pressure setting range 0–100 psi• |
| 5. | Auto Injection facility | Injection range up to 100 ul.•<br>RSD of better than 0.3% RSD area reproducibility•<br>Vial capacity should be 15 or more.• | NOT REQUIRED |
| 6. | Software | Original window-based software with license• | Original window-based software with license• |

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| 7. | FID | Maximum operating temperature 425 °C or better•<br>MDL•<3 pg carbon/s as tridecane or better<br>Linear dynamic range•>$10^7$ or better<br>Maximum data acquisition rate 450 Hz or better•<br>Full range digital data path enables peaks to be quantified over the entire $10^7$concentration range in a single run.• | FID · Maximum operating temperature 425 °C or better ·<br>MDL : 1.2 pg carbon/s or better |
| 8. | TCD | Maximum operating temperature 400 °C•<br>MDL•<800 pg tridecane/mL or better<br>Linear dynamic range $10^5$• | **ECD Detector :**<br>• Radioactive source: 370 MBq equal to 10 mCi, 63Ni or better<br>• MDL: <4.5 fg/s lindane or better<br>• Linear dynamic range: >$10^4$ with lindane or better |
| 9. | Consumables | Vials and Caps- 5000•<br>EI Filament-1•<br>Liner- 10 each for split and split-less•<br>Ferrules- 10•<br>Column nut- 10•<br>Septa- 100•<br>Glass wool- 10•<br>Auto sampler syringe- 4• | Vials and Caps- 5000•<br>Liner- 10 each for split and split-less•<br>Ferrules- 10•<br>Column nut- 10•<br>Septa- 100•<br>Glass wool- 10• |
| 10. | Computer | Compatible Computer•& LaserJet Printer | Compatible Computer•& LaserJet Printer |
| 11. | Gas Cylinder | Zero Air, H2 and N2 Gas Cylinder, regulators with Gas purification panel.• | •True On-line 10 KVA UPS with 60 minutes battery backup<br>•UHP Grade Nitrogen Gas with Double Stage SS Diaphram Regulator-2set<br>•UHP Grade Hydrogen Gas with Double Stage SS Diaphram Regulator 1 set ( FOR FID)<br>•UHP Grade Zero Air Gas with Double Stage SS Diaphram Regulator 1 set ( FOR FID)<br>•UHP Grade Helium Gas with Double Stage SS Diaphram Regulator 2 set .<br>•Suitable Laser Jet Printer –Qty 1<br>Gas purification panel for all required gases 10 µL liquid -2Nos & 5ml Gas Tight Syringe -1 No |
| 12. | MS/MS System | Additional Points | **Ion Source:** should be Free from any form wired connection, easy to clean, easy to maintain off-axis ion source, with suitable facility to carry out helium ion burn in source before the main quadrupole.<br>Should have dual filaments in all ionization modes. Source with Programmable heating at 350 °C or better<br>• It should have accurate regulation of emission current up to 350 µA or more with improved regulation at low current.<br>• It should have Integrated, dual filament assembly mounted with the same geometry with improved filament lifetime and effective regulation of emission current across the available emission current range.<br>• The User definable electron energy should be adjustable from 0-150 eV or |

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| | | | more<br>• It should have constant calibration gas pressure for optimum system tuning.<br>• The GC transfer line temperature should be programmable up to 400 °C or more.<br>• The system should have suitable technology to prevent neutrals to gain entry into the main analytical quadrupole.<br>• Installation checkout sensitivity must be better than<br>Instrument detection limit: ≤0.3fg or less octaflouronaphthalene (OFN)<br>Easy cleaning and removal of source, columns, septa with any introduction of atmospheric air into the system.<br><br>**GC-MS Columns :**<br>One Mid-Polar Column-Qty1<br>One Non-Polar Column-Qty1<br>One Polar Column-Qty1 |
| 13. | **Additional Item** | COMBINED AUTO SAMPLER | All in one automated Liquid, Headspace & Solid Phase Micro Extraction Sampler with X-Y-Z movement –<br>For analysis of samples of Flavor profiling in food & beverages, VOC in fruit juices, fruit and vegetables, Pesticides in food, Caffeine in tea, coffee, Off-flavor in food beverages, Terpenoids in herbs, essential oils, Phenols, volatiles, flavors in tobacco, Pheromones etc.<br>Three directional robotic sample handling apparatus<br>**Auto Sampler (liquid) –**<br>100 vial liquid sample holding capacity 1.5 ml or 2 ml<br>Sample injection volume: 1.0 to 10 ul or better<br>**Headspace Sampler mode –**<br>Head space sampler with minimum 40 vial capacity or more<br>Vial Volume –20/22mL<br>Syringe Temperature: 50 °C to 150 °C in 1 °C steps or more<br><br>**Automated Solid Phase Micro Extraction Arrow mode with fiber conditioning module –**<br>Incubation with agitation oven to be heated up to 150°C, and featuring 6 positions for 10/20 ml vials<br>Fiber conditioning module for -<br>Fully unattended operations<br>Overcome the limited automation of other extraction techniques<br>Total parameters and workflow controlled by suitable software<br>**Fiber clean up:**<br>**SPME ARROW Fibers** - Suitable Fibers (with bigger surface area) (SPME Fiber and SPME |

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| | | | Arrow) for Polar, nonpolar & Mixed Polarity samples /aroma analysis – for 1000 sample analysis |

**79. LIQUID CHROMATOGRAPHY-TANDEM MASS SPECTROMETER MS/MS (PAGE NO.116)**

| Sl.No. | Main component | Detailed specifications | Revised Specifications |
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| 5. | Mass Range | 2 to 2000 m/z | 2 to 3000 m/z or better |
| 8. | Resolution | Unit Resolution | Down to 0.4 amu or better |
| 9. | ESI sensitivity in SIM mode | 70:1 RMS for 1pg on column quantity of Reserpine in ESI +ve. | **MS/MS Sensitivity (SRM/MRM) (Performance Specifications should be an installation specification)**<br>**MS/MS Sensitivity (MRM/SRM) should be as follows:**<br>ESI Positive Electrospray ionization 1 pg on column reserpine signal to noise ratio 500000:1 or better<br>ESI Negative electrospray ionization 1 pg on column chloramphenicol signal to noise ratio 500000:1 or better<br>SRM/MRM Speed >590/Sec or higher with zero cross talk.<br>Atmospheric pressure chemical ionization (APCI) :<br>Should produce a minimum signal-to-noise ratio of 20,000:1 or better for the |
| 11. | **Additional Points** | | **Accessories Prerequisites**<br>A) Branded N2 generator with in-built compressor 1 nos<br>B) Gas One high-purity 99% pure, UHP grade Argon gas cylinder. With dual stage Pressure regulator<br>C) Gas Panel with Traps and filters.<br>D) 10 KVA branded UPS with 60 min Power back up.<br>E) Suitable LC-MS calibration standards for pesticide multi-residue method and other chemical residues etc. with solvent for required installation, in addition to following:<br>MS grade solvents: acetonitrile (16 lts), Methanol (32lts), water (32 lts), Formic acid (100 ml), Ammonium acetate (100 gm), ammonium formate (100 gm) & Aceticacid (100 gm).<br>**Sample Preparation Accessories**<br>System should be offered with suitable sample Preparation accessories and Quchers Kit for 1000 sample extraction, SPE kit for pesticides, mycotoxin, aflatoxin, vitamin analysis for 1000samples and suitable sample vacuum manifold with imported vacuum pump. |

**81. ULTRA-HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY (UHPLC) &HIGH RESOLUTION ACCURATE MASS SPECTROMETER (MS/MS) (Page No. 118):**

| Sl. No. | Detailed specifications | Revised Specifications |
|---|---|---|
| 1. | **Technical Requirements**<br>A. **MS/MS:** The System shall-<br><br>Include at least two ionization sources that may include a multimodel ESI/APCI with attributes such as but not limited to ability to switch between ionization modes as well as polarization (positive/negative ion) switching in 15 ms-20 ms; | **Technical Requirements**<br>1. **MS/MS:**<br>Provides <1 ppm RMS mass accuracy under defined conditions with minimum effort for at least five days<br>• Generates optional internal reference ions for real-time mass correction of spectra in both positive and negative modes |
| 2. | Have a mass resolution of ≤0.7 amu, full width at half maximum; | Mass resolution Up to 90,000 at m/z 200 or higher |
| 3. | Demonstrate high sensitivity: minimum of 250,000:1 signal-to-noise ratio (S/N) following injection of 1 pg or below, of a suitable analyte (e.g. reserpine) analysed in positive ESI or relevant food contaminant at ultra-trace level in appropriate matrix; | MS/MS: 200 fg reserpine on column S/N 100:1 or better<br>tSIM: 200 fg reserpine on column S/N 250:1 or better |
| 4. | With regard to the hybrid option, have two analyzer types, a quadrupole and a 2D ion trap with a minimum S/N ratio of 90,000:1 upon analysis of a food/feed contaminant such as (but not restricted to) chloramphenicol at 1 pg or below in multiple/selected reaction monitoring negative mode, following on column or alternative injection that does not bypass the UHPLC; | With regard to the hybrid option, have two analyzer types, a quadrupole and a 2D ion trap/Orbitrap suitable High Resolution Accurate Mass analyzer |
| 5. | **Additional Points** | Scan functions<br>Full MS scan<br>MS2 by Data-Dependent Acquisition (DDA) following a master scan (i.e., a Full MS scan):<br>• With Top4, 14 Hz MS2 (discovery)<br>tMS2<br>• Targeted MS2 with Mass List Table (confirmation)<br>• Isolation Width, HCD Collision Energy, RF Lens, Resolution, Polarity set values are definable compound dependent<br>(w/o msx)<br>tSIM<br>• Targeted SIM with Mass List Table<br>• With Targeted Mass Filter for ddMS2 (confirmation)<br>• All Ion Fragmentation |
| 6. | **Additional Points :** | **Accessories Prerequisites**<br>A) Branded N2 generator with in-built compressor 1 nos with additional two UHP Grade N2 Cylinder with Gas panel and double stage regulators.<br>B) Gas One high-purity 99% pure, UHP grade Argon gascylinder. With dual stage Pressure regulator<br>C) Gas Panel with Traps and filters.<br>D) 10 KVA branded UPS with 60 min Power back up.<br>E) Suitable LC-MS calibration standards for pesticide multiresidue method and other chemical residues etc. withsolvent for required installation, in addition to following:<br>MS grade solvents: acetonitrile (16 lts), Methanol (32lts), water (32 lts), Formic acid (100 ml), |

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| | | Ammoniumacetate (100 gm), ammonium formate (100 gm) & Aceticacid (100 gm).<br>**Sample Preparation Accessories**<br>System should be offered with suitable sample Preparationaccessories and Quchers Kit for 1000 sample extraction, SPE kitfor pesticides, Metabolities, analysis for 1000samples and suitable sample vacuum manifold with importedvacuum pump. |