

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| <b>Equipment:</b> Liquid Chromatography – High Resolution Quadrupole Time-of-Flight Tandem Mass Spectrometry (LC-QTOF-MS) System                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Compliances (Yes/ No)</b><br><i>**If No, please indicate reason of non-compliances.</i> |
| <b>Location:</b> Chemical Metrology Laboratory (CML) <b>Quantity:</b> 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                            |
| <b>Technical Specifications</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                            |
| <ul style="list-style-type: none"> <li>- The system must be a high resolution quadrupole time-of-flight (QTOF) tandem mass spectrometry (MS/MS) coupled with an ultra-performance liquid chromatography (UPLC).</li> <li>- The system must be able to operate on these conditions: <ul style="list-style-type: none"> <li>(a) Ambient operating temperature: 15- 35 °C;</li> <li>(b) Ambient operating humidity: 5-95%;</li> <li>(c) Storage extremes: -40 °C to 70 °C;</li> <li>(d) Line voltage requirements: 230 V ± 10 %; and</li> <li>(e) Conforms to the following safety standards and regulations: CSA, IEC, EN, and ISO9001.</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Yes/ No                                                                                    |
| <p><b>(A) Mass Spectrometer</b></p> <p><b>(A.1) Interface and Ion Source</b></p> <ul style="list-style-type: none"> <li>- The interface between UPLC and MS should be capable of handling large batches of samples with complex matrices over a continuous period of at least two months.</li> <li>- The routine maintenance and cleaning of QTOF MS/MS must be simple and can be carried out by the user.</li> <li>- The instrument must have a direct atmosphere-to-vacuum interface module with a curtain gas barrier to maintain analyzer cleanliness and for optimizing ion declustering.</li> <li>- The system must be equipped with an electrospray ionisation (ESI) source.</li> <li>- The ionisation probes switching must be simple and tool free.</li> <li>- The ion source must have orthogonal spraying for improved robustness.</li> <li>- The ion source must have self-cleaning heater with temperature sensor.</li> <li>- The ion source must have a flow rate compatibility in ESI mode which cover the range of 5µL/min to 1000 µL/min.</li> <li>- The solvent compatibility for the ion source must be from 100% aqueous to 100% organic, with full gradient capability.</li> <li>- The ESI nebulizer gas must be user selectable covering the range of 0 to 90 psi (0 to 0.62 MPa).</li> <li>- The desolvation temperature must be user selectable covering the range from ambient temperature to 700°C.</li> <li>- All ion source parameters except sprayer positioning must be computer-controllable.</li> <li>- The cleaning and maintenance of desolvation line must be simple and must be able to carry out without breaking the vacuum.</li> <li>- The source must be able to be removed from the host system without tools and without breaking the vacuum.</li> <li>- A syringe pump must be available for direct infusion of sample.</li> </ul> | Yes/ No                                                                                    |
| <p><b>(A.2) Mass Analyzer</b></p> <ul style="list-style-type: none"> <li>- The mass analyzer must consist of a quadrupole mass filter, a quadrupole collision cell and a high performance time-of-flight (TOF) analyzer.</li> <li>- The mass analyzer must be able to provide full scan of MS and MS/MS, product ion scan, and precursor ion scan.</li> <li>- Sensitivity: the signal-to-noise in MS/MS mode must be equal to or be higher than 60:1, for reserpine 200 fg on column.</li> <li>- The scan speed must be no less than 25 Hz for MS scan, and no less than 50</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Yes/ No                                                                                    |

| <b>Equipment:</b> Liquid Chromatography – High Resolution Quadrupole Time-of-Flight Tandem Mass Spectrometry (LC-QTOF-MS) System<br><br><b>Location:</b> Chemical Metrology Laboratory (CML) <b>Quantity:</b> 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Compliances (Yes/ No)</b><br><br><i>**If No, please indicate reason of non-compliances.</i> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| <p>Hz for MS/MS scan.</p> <ul style="list-style-type: none"> <li>- The MS high mass resolution must be 35000 [full width half height (FWHM)] or better at m/z around 1000 using a <math>\geq 10</math> ms accumulation time.</li> <li>- The MS/MS low mass resolution must be 25000 (FWHM) or better at m/z around 200 and 18,000 (FWHM) at m/z around 90 using a <math>\geq 10</math> ms accumulation time.</li> <li>- The MS/MS high mass resolution must equal to 30000 (FWHM) or better at m/z around 800.</li> <li>- The mass accuracy must be less than or equal to 800 ppb root mean square (RMS) error by internal calibration, and 2 ppm RMS error by external calibration for MS mode.</li> <li>- The inter-scan linear dynamic range must be greater than or equal to 5 orders of magnitude without signal reduction.</li> <li>- The intra-scan linear dynamic range must be greater than or equal to 4 orders of magnitude.</li> <li>- Computer-controllable polarity switching must be provided.</li> <li>- The QTOF mass range must cover 20 to 40000 m/z for high resolution MS.</li> <li>- The precursor ion selection range must cover 20 to 2200 m/z.</li> <li>- There must be a shutter to cut-off gas flow when no mobile-phase flows or during stand-by mode.</li> <li>- Programmable software-controllable flow switching valve for diverting the flow to waste must be available.</li> <li>- Auto-tuning must be standard with a syringe pump that delivers accurate calibrant injection under full workstation control in both positive and negative modes. Manual tuning must also be allowed.</li> <li>- A LC-MS start-up kit must be supplied as standard.</li> <li>- A cover must be provided to reduce the noise of rough pump.</li> </ul> |                                                                                                |
| <p><b>(B) UPLC</b><br/><b>(B.1) Binary Gradient Pump</b></p> <ul style="list-style-type: none"> <li>- The system must be equipped with two solvent selection valves to enable the choice of different solvents.</li> <li>- The solvent delay volume must be no more than 200 <math>\mu\text{L}</math>.</li> <li>- Minimum flow rate must be no more than 10 <math>\mu\text{L}/\text{min}</math>.</li> <li>- Maximum flow rate must be no less than 2 mL/min.</li> <li>- The maximum back pressure must be no less than 15000 psi.</li> <li>- The flow rate must be settable within the range of 10 to 2000 <math>\mu\text{L}</math> in 1 <math>\mu\text{L}/\text{min}</math> increments.</li> <li>- The flow accuracy must be within <math>\pm 1\%</math>.</li> <li>- The flow precision must be no larger than 0.1% RSD.</li> <li>- The gradient composition accuracy must be within <math>\pm 0.5\%</math>.</li> <li>- The gradient composition precision must be no larger than 0.2% RSD.</li> <li>- The system must be equipped with a leak sensor which feedback to software when leaks are detected.</li> <li>- The system must be equipped with integrated vacuum degasser.</li> <li>- The system must be able to switch among four different mobile phases (any two of the four) by programmable software, allowing the switch between two different installed columns using any two of the four mobile phases.</li> </ul>                                                                                                                                                                                                                                                                                                                                      | <p>Yes/ No</p>                                                                                 |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| <b>Equipment:</b> Liquid Chromatography – High Resolution Quadrupole Time-of-Flight Tandem Mass Spectrometry (LC-QTOF-MS) System<br><br><b>Location:</b> Chemical Metrology Laboratory (CML) <b>Quantity:</b> 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Compliances (Yes/ No)</b><br><i>**If No, please indicate reason of non-compliances.</i> |
| <ul style="list-style-type: none"> <li>- Reservoir tray (with four solvent bottles complete with fittings) and automatic rinsing kit must be supplied.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                            |
| <b>(B.2) Column Oven</b> <ul style="list-style-type: none"> <li>- The temperature control range must cover the range of 20.0 °C to 90.0 °C.</li> <li>- The temperature set point accuracy must be within <math>\pm 0.5</math> °C.</li> <li>- The temperature stability must be within: <math>\pm 0.15</math> °C for flow rates between 1 and 1000 <math>\mu\text{L}/\text{min}</math>.</li> <li>- The system must be equipped with temperature limit device and temperature fuse.</li> <li>- The system must be capable of temperature programming in linear and step programmes.</li> <li>- The system must be able to be installed with at least two columns with a minimum length of 25 cm.</li> <li>- The switch and selection of the installed columns must be user settable using programmable software.</li> <li>- The pressure tolerance must be no lower than 15000 psi.</li> <li>- It must be equipped with a leak sensor for leak detection.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                     | Yes/ No                                                                                    |
| <b>(B.3) Auto-Sample Injector</b> <ul style="list-style-type: none"> <li>- Sample injection volume must be variable between 0.1 <math>\mu\text{L}</math> to 100 <math>\mu\text{L}</math> with zero sample loss during injection.</li> <li>- The number of samples to be processed automatically and random access must be no fewer than 60 positions for 2 mL vial volume.</li> <li>- The system must allow customised continuous analysis according to the conditions specified for each sample, including pretreatment, injection and analysis conditions.</li> <li>- The system must allow insertion of priority samples in the queue during automated run.</li> <li>- Flow line rinse capability both before and after sampling must be possible and settable.</li> <li>- Carry over must be no higher than 0.005%.</li> <li>- The maximum operation pressure must be not lower than 15000 psi.</li> <li>- The injection accuracy must be within <math>\pm 1\%</math>.</li> <li>- The injection precision must be no higher than 0.2% RSD.</li> <li>- It must be equipped with a leak sensor, automatic rack and vial recognition as safety feature.</li> <li>- It must have a cooling capability with temperature range covering 4 °C to 40 °C</li> <li>- It must have functions for maintenance which are accessible by a dedicated operation button.</li> </ul> | Yes/ No                                                                                    |
| <b>(B.4) System Controller</b> <ul style="list-style-type: none"> <li>- It must be able to function as a communication module with data buffering.</li> <li>- It must be able to terminate analysis when pressure falls below or reaches above a specified value which is user settable.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Yes/ No                                                                                    |
| <b>(C) Data system</b> <ul style="list-style-type: none"> <li>- Data processing and complete system control with software must be available.</li> <li>- Real time monitoring with diagnostics functions (listed below) must be available:</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Yes/ No                                                                                    |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| <b>Equipment:</b> Liquid Chromatography – High Resolution Quadrupole Time-of-Flight Tandem Mass Spectrometry (LC-QTOF-MS) System<br><br><b>Location:</b> Chemical Metrology Laboratory (CML) <b>Quantity:</b> 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Compliances (Yes/ No)</b><br><i>**If No, please indicate reason of non-compliances.</i> |
| <ul style="list-style-type: none"> <li>(a) Instrument diagnostics, including leak tests.</li> <li>(b) Access to maintenance, run and even logs.</li> <li>(c) Access to maintenance information, such as manuals and videos.</li> <li>- Software must be capable of performing sequencing, reporting, auto- tuning, calibration, and QA/QC checking, etc.</li> <li>- The software must be able to generate both standard and user settable custom reports to suit different needs.</li> <li>- The system must have capability to share and distribute electronic methods between different LC-QTOF and/or labs easily and securely.</li> <li>- The system must be able to perform manual integration of single and group peaks capability for better peak identification.</li> <li>- The system must come with software to identify unknown compounds based on the concept of high resolution mass accuracy and mass spectral purity.</li> <li>- The system must come with software to identify unknown proteins/peptides based on the concept of high resolution mass accuracy and peptide mapping.</li> <li>- Free software upgrade must be provided. If the upgraded software is not compatible with the existing computer and/or existing operation system, free computer and/or operation system must be provided.</li> </ul> |                                                                                            |
| <b>(D) PC and Printer</b> <ul style="list-style-type: none"> <li>- Minimum configuration: Intel Core i5 3.2GHz or equivalent, 8GB RAM, 1 TB hard drives, DVD RW (CD RW capable), USB optical scroll mouse, SB internet keyboard, high resolution 20 to 22 inch flat panel colour monitor.</li> <li>- Microsoft® Windows® 7 Professional 32 or 64 bit must be installed.</li> <li>- System Documentation Kit must be provided.</li> <li>- Microsoft office software must be installed.</li> <li>- The PC(s) must be under 3-year full warranty and accompanied with their system recovery CDs or DVDs.</li> <li>- Laser jet printer must be provided.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Yes/ No                                                                                    |
| <b><u>Miscellaneous</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                            |
| <ul style="list-style-type: none"> <li>- All gas lines must be labelled.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Yes/ No                                                                                    |
| <ul style="list-style-type: none"> <li>- Tendered price must include delivery, installation, commissioning and training. The system shall come with at least one (1) year warranty. The warranty must include one (1) preventive maintenance every year, unlimited breakdown calls, unlimited on-site services, replacement of parts, transportation, and man power, and cover the overall system (both hardware and software). Any software revisions should also be provided at no additional cost during warranty period. The Tenderer must oversee overall systems integration, site preparation, installation and necessary configuration of the system.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Yes/ No                                                                                    |
| <ul style="list-style-type: none"> <li>- A declaration of Conformity certificate must be provided upon commissioning of equipment.</li> <li>- The delivery of the equipment must be coordinated with the Laboratory.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Yes/ No                                                                                    |
| <ul style="list-style-type: none"> <li>- The Tenderer must provide after-sales support from engineers and application chemists in Singapore. The tenderer must have a strong track record in providing personalised and responsive after-sales support in Singapore, that is, the company must provide:           <ul style="list-style-type: none"> <li>(a) contacts (mobile number and email) of at least two engineers experienced with the system;</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Yes/ No                                                                                    |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| <b>Equipment:</b> Liquid Chromatography – High Resolution Quadrupole Time-of-Flight Tandem Mass Spectrometry (LC-QTOF-MS) System<br><br><b>Location:</b> Chemical Metrology Laboratory (CML) <b>Quantity:</b> 1                                                                                                                                                                                                                                                                                                     | <b>Compliances (Yes/ No)</b><br><i>**If No, please indicate reason of non-compliances.</i> |
| (b) immediate instruction for trouble shooting by telephone when requested;<br>(c) on-site service within 2 Working Days (Monday to Friday, 8:00 am to 5:30 pm) when requested; and<br>(d) replacement of parts (within 2 Working Days when parts are available in Singapore, within 5 Working Days when parts are not available in Singapore and are needed to be ordered from overseas) when necessary.                                                                                                           |                                                                                            |
| - Tenderer shall guarantee that the spare parts, consumables and services for the system will be available for a period of at least eight (8) years from the date of discontinuation of the system and shall further undertake to locally supply or make available these parts/consumables for the said period.                                                                                                                                                                                                     | Yes/ No                                                                                    |
| - Tenderer must provide on-site instrument operation and user maintenance training by certified engineer(s). The certificate(s) shall be provided upon request.                                                                                                                                                                                                                                                                                                                                                     | Yes/ No                                                                                    |
| - Tenderer shall provide the list and the cost of the chargeable consumables or wear and parts that are not included in the warranty and post warranty comprehensive maintenance/services for a total of four (4) years. Items that are not included in the list shall not be chargeable to the Authority.                                                                                                                                                                                                          | Yes/ No                                                                                    |
| - Option to purchase: Tenderer is required to quote comprehensive maintenance contract for three (3) years after the warranty period. The comprehensive maintenance contract shall cover manpower and the overall system including hardware and software. The price quoted shall minimally include the following:<br>(a) provision of unlimited breakdown calls and on-site services;<br>(b) provision of replacement parts<br>(c) to provide one (1) preventive maintenance per year<br>(d) any software revisions | Yes/ No                                                                                    |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <p><b>Equipment:</b> Liquid Chromatography – High Resolution Quadrupole Time-of-Flight Tandem Mass Spectrometry (LC-QTOF-MS) System</p> <p><b>Location:</b> Chemical Metrology Laboratory (CML)                      <b>Quantity:</b> 1</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p><b>Compliances (Yes/ No)</b></p> <p><i>**If No, please indicate reason of non-compliances.</i></p> |
| <p><b>PERFORMANCE OF SERVICES</b></p> <p><b>– THREE (3) YEARS POST WARRANTY COMPREHENSIVE MAINTENANCE</b></p> <ul style="list-style-type: none"> <li>- The Contractor shall perform the Services in accordance with the manufacturer's recommendations in order to maintain the system in Good Working Order.</li> <li>- The Services to be performed by the Contractor shall consist of Preventive Maintenance and Corrective Maintenance as described below.</li> </ul> <p>(I) Preventive Maintenance</p> <p>a) The Preventive Maintenance shall consist of:<br/> Routine maintenance of the Equipment, including but not limited to the testing of functions and inspecting of the condition of the System in order to keep the Equipment safe for use and in Good Working Order; and<br/> Adjustment and/or repair of any defect in or malfunction of the System discovered by the Contractor's representatives during the course of routine maintenance checks.</p> <p>b) The Preventive Maintenance performed shall be in compliance with the maintenance procedures and safety tests.</p> <p>c) The Preventive Maintenance shall be carried out and completed during Working Day.</p> <p>(II) Corrective Maintenance</p> <p>a) Upon receipt of oral or written notice from the Authority, the Contractor shall use its best endeavours to ensure that the Contractor's suitably qualified and duly authorised representatives attends to the Authority, within the response time of not more than 24 hours upon receipt of oral/written notification if the request is made on a Working Day, to make such repairs or adjustments to and/or to replace the defective or malfunctioning Equipment or any part thereof so as to restore the Equipment to Good Working Order. If the request is made on a non-Working Day, the Contractor shall respond within the first 24 hours of the beginning of the next Working.</p> <p>b) The Contractor shall attend to unlimited breakdown calls during Working Day. For this purpose, the Contractor shall provide the Company with a telephone number through which requests for Corrective Maintenance can be made by the Authority.</p> <p>c) The Contractor shall complete any repair, or replacement or adjustment of components within two (2) working days if there is no need to order parts from overseas from and including the date on which the Contractor was given notice pursuant to Clause II (a) unless the Authority had agrees in writing to have the time period extended.</p> |                                                                                                       |
| <p><b>REPLACEMENT AND PURCHASE OF COMPONENTS</b></p> <ul style="list-style-type: none"> <li>- The Contractor shall inform the Authority of any part or component of the Equipment that needs to be replaced. Prior written approval must be issued by</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                       |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| <b>Equipment:</b> Liquid Chromatography – High Resolution Quadrupole Time-of-Flight Tandem Mass Spectrometry (LC-QTOF-MS) System                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Compliances (Yes/ No)</b><br><i>**If No, please indicate reason of non-compliances.</i> |
| <b>Location:</b> Chemical Metrology Laboratory (CML) <b>Quantity:</b> 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                            |
| <p>the Authority before the replacement may be effected unless the replacement required is deemed urgent by the Authority in which case a verbal approval (which shall subsequently be confirmed in writing) obtained from an authorised officer of the Authority shall suffice.</p> <ul style="list-style-type: none"> <li>- The Contractor shall use all reasonable endeavours to supply only original or genuine replacement components, which are required to maintain the Equipment in Good Working Order. All replacement components shall be provided free-of-charge during the period of warranty period and post warranty comprehensive maintenance contract.</li> </ul> |                                                                                            |

**I hereby confirm that I can meet all the Requirement Specifications as stated above.**

Tenderer's (as \*Principal/Agent)  
Company or Business Registration No:

Tenderer's official  
Stamp:

Authorized Signature

Name:

Designation:

(\*Delete whichever is not applicable)

Please indicate any non-compliance here should there be any.

| Reference To | Remarks |
|--------------|---------|
|              |         |
|              |         |
|              |         |
|              |         |