

| Equipment 3: High Performance Liquid Chromatograph (HPLC) with CAD/ ELSD/ QDA and DAD                                                                                                                                                                                                                               |                                                                                                                             | Compliances Checklist (Yes/ No) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Location: Food Safety Laboratory (FSL) Quantity: 1                                                                                                                                                                                                                                                                  |                                                                                                                             |                                 |
| <p>The HPLC system shall comprise Liquid chromatograph mainframe with (A) Binary/ Quaternary pump, (B) thermostatted column compartment, (C) Autosampler and 2 detectors.</p> <p>The detectors shall be:</p> <ul style="list-style-type: none"> <li>a) CAD or ELSD or QDA; and</li> <li>b) DAD detector.</li> </ul> |                                                                                                                             | Yes/ No                         |
| <b>High Performance Liquid Chromatograph System</b>                                                                                                                                                                                                                                                                 |                                                                                                                             |                                 |
| <b>(A) Binary / Quaternary Pumps</b>                                                                                                                                                                                                                                                                                |                                                                                                                             |                                 |
| (i)                                                                                                                                                                                                                                                                                                                 | Pumps must be able to operate in the pH range of 2-12.                                                                      | Yes/ No                         |
| (ii)                                                                                                                                                                                                                                                                                                                | Pumps must be able to perform gradient proportioning and withstand operating pressure of 600 bar or higher during analysis. | Yes/ No                         |
| (iii)                                                                                                                                                                                                                                                                                                               | Must have a minimum 2 solvent channels.                                                                                     | Yes/ No                         |
| (iv)                                                                                                                                                                                                                                                                                                                | Active seal wash or equivalent.                                                                                             | Yes/ No                         |
| (v)                                                                                                                                                                                                                                                                                                                 | Flow accuracy of $\pm 1\%$ or better.                                                                                       | Yes/ No                         |
| (vi)                                                                                                                                                                                                                                                                                                                | User-selectable flow composition to range from 0 – 100%.                                                                    | Yes/ No                         |
| (vii)                                                                                                                                                                                                                                                                                                               | Flow precision of $\leq 0.075\%$ Relative Standard Deviation (RSD) or better.                                               | Yes/ No                         |
| (viii)                                                                                                                                                                                                                                                                                                              | Flow rate of at least up to 5ml/min.                                                                                        | Yes/ No                         |
| (ix)                                                                                                                                                                                                                                                                                                                | Must come with degasser unit.                                                                                               | Yes/ No                         |
| (x)                                                                                                                                                                                                                                                                                                                 | Must have built-in leak sensors and excess pressure monitoring function.                                                    | Yes/ No                         |
| <b>(B) <u>Thermostatted column compartment</u></b>                                                                                                                                                                                                                                                                  |                                                                                                                             |                                 |
| (i)                                                                                                                                                                                                                                                                                                                 | Must provide temperature accuracy of $\pm 0.5^{\circ}\text{C}$ or better.                                                   | Yes/ No                         |
| (ii)                                                                                                                                                                                                                                                                                                                | Must provide temperature stability of $\pm 0.2^{\circ}\text{C}$ or better.                                                  | Yes/ No                         |
| (iii)                                                                                                                                                                                                                                                                                                               | Must support operating temperature range from 5 °C above ambient to 80 °C.                                                  | Yes/ No                         |
| (iv)                                                                                                                                                                                                                                                                                                                | Must fit at least one unit of column with minimum 30 cm in length.                                                          | Yes/ No                         |
| (v)                                                                                                                                                                                                                                                                                                                 | 1 LC column for the analysis of fructose, glucose, sucrose and maltose shall be provided                                    | Yes/ No                         |
| <b>(C) <u>Autosampler</u></b>                                                                                                                                                                                                                                                                                       |                                                                                                                             |                                 |
| (i)                                                                                                                                                                                                                                                                                                                 | Must have minimum sample capacity of 100 × 2ml HPLC vial.                                                                   | Yes/ No                         |
| (ii)                                                                                                                                                                                                                                                                                                                | Capable of injection volume from 1 to 50 ul or larger.                                                                      | Yes/ No                         |

| Equipment 3: High Performance Liquid Chromatograph (HPLC) with CAD/<br>ELSD/ QDA and DAD |                                                                                                                                  | Compliances<br>Checklist<br>(Yes/ No) |
|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Location: Food Safety Laboratory (FSL)                                                   | Quantity: 1                                                                                                                      |                                       |
| (iii)                                                                                    | Must have injection volume precision of $\leq 0.25\%$ RSD.                                                                       | Yes/ No                               |
| (iv)                                                                                     | Must have carry-over of $\leq 0.004\%$                                                                                           | Yes/ No                               |
| (v)                                                                                      | Capable of controlling the sample holder temperature from 4 to 40°C.                                                             | Yes/ No                               |
| <b>(D) <u>Charged Aerosol Detector (CAD)</u></b>                                         |                                                                                                                                  |                                       |
| (i)                                                                                      | Minimum Solvent flow rate of 0.1 – 2.0 ml/min.                                                                                   | Yes/ No                               |
| (ii)                                                                                     | Data collection rate of up to 200 Hz or higher                                                                                   | Yes/ No                               |
| (iii)                                                                                    | Warm up time < 30 minutes to 35°C.                                                                                               | Yes/ No                               |
| (iv)                                                                                     | Electronic gas pressure control.                                                                                                 | Yes/ No                               |
| <b>(E) <u>Evaporative Light Scattering Detector (ELSD)</u></b>                           |                                                                                                                                  |                                       |
| (i)                                                                                      | LED light source or equivalent.                                                                                                  | Yes/ No                               |
| (ii)                                                                                     | Eluent flow range from 0.2 – 2.5 ml/min or higher.                                                                               | Yes/ No                               |
| (iii)                                                                                    | Temperature range from 5 °C above ambient to 80 °C or better.                                                                    | Yes/ No                               |
| <b>(F) <u>QDA</u></b>                                                                    |                                                                                                                                  |                                       |
| (i)                                                                                      | Atmospheric pressure ionization (API) electrospray (ES) interface.                                                               | Yes/ No                               |
| (ii)                                                                                     | Support ion polarity switching.                                                                                                  | Yes/ No                               |
| (iii)                                                                                    | Low noise, long life photomultiplier detector with dynamic range of at least $4 \times 10^6$ .                                   | Yes/ No                               |
| (iv)                                                                                     | Support full scan and selected ion recording (SIR).                                                                              | Yes/ No                               |
| (v)                                                                                      | Mass range from 30 – 1250 m/z or better.                                                                                         | Yes/ No                               |
| (vi)                                                                                     | Mass accuracy $\pm 0.2$ Da or better over full mass range.                                                                       | Yes/ No                               |
| (vii)                                                                                    | Mass drift $\leq 0.1$ Da over 24 hours.                                                                                          | Yes/ No                               |
| <b>(G) <u>Diode Array Detector (DAD)</u></b>                                             |                                                                                                                                  |                                       |
| (i)                                                                                      | Sampling rate of 80 Hz or higher.                                                                                                | Yes/ No                               |
| (ii)                                                                                     | Must have analytical flow cell with 10 mm path length or better.                                                                 | Yes/ No                               |
| (iii)                                                                                    | Tenderer shall quote for the <b>option to purchase</b> higher sensitivity flow cell of at least 60mm path length, if applicable. | Yes/ No                               |
| (iv)                                                                                     | The wavelength range must be at least 190 – 640 nm.                                                                              | Yes/ No                               |
| (v)                                                                                      | Collect at least 8 or more independent channels simultaneously.                                                                  | Yes/ No                               |

| <b>Equipment 3: High Performance Liquid Chromatograph (HPLC) with CAD/ ELSD/ QDA and DAD</b><br><b>Location: Food Safety Laboratory (FSL)                      Quantity: 1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | <b>Compliances Checklist (Yes/ No)</b> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------|
| (vi)      Wavelength accuracy $\pm 1$ nm or better                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | Yes/ No                                |
| <b>(H) <u>Computer and software</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |                                        |
| (i)      1 set of Desktop computer with one printer for data acquisition and processing with minimum specification as follows shall be provided:<br>- Intel Core I5<br>- 8 GB RAM Memory<br>- 1 TB hard disk<br>- Windows 7<br>- Microsoft office 2013 or better<br>- Antivirus software<br>- 19 inch LCD monitor<br>- Keyboard<br>- Mouse and mouse pad<br>- Laser printer<br>(ii)     The price quoted shall include the software to perform the following:<br>- Full digital instrument control<br>- Qualitative and quantitative processing<br>- Report generation<br>- Diagnostic checks on LC unit and detectors |  | Yes/ No                                |
| <b>(I) <u>Furniture</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                                        |
| (i)      The instruments are to be placed on existing bench with the dimension of L210 × W55 cm. In the event if additional platform is required in order to place the proposed system, tenderer shall bear the relevant cost and the proposed platform shall not exceed L220 x W65 cm in total.                                                                                                                                                                                                                                                                                                                       |  | Yes/ No                                |
| <b>(J) <u>Training and commissioning</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                        |
| (i)      The price quoted must provide onsite or off-site training for the following:<br>- Theory training (for a total of approximate 34 HSA trainees);<br>- Basic training (for a total of approximate 34 HSA trainees. Each training to be held shall not exceed 8 pax);<br>- Advance & Maintenance training (for a total of approximate 12 HSA trainees)                                                                                                                                                                                                                                                           |  | Yes/ No                                |
| <b>(K) <u>Onsite inspection post tender award</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                        |
| (i)      Supplier must perform site readiness inspection and onsite risk assessment for new instrument installation safety compliance.<br>(ii)     Risk assessment report must be submitted in 5x5 matrix before delivery of the instrument.                                                                                                                                                                                                                                                                                                                                                                           |  | Yes/ No                                |
| <b>(L) <u>Accreditation / Certification/ Track Records</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                        |

| Equipment 3: High Performance Liquid Chromatograph (HPLC) with CAD/ ELSD/ QDA and DAD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | Compliances Checklist (Yes/ No) |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------|
| Location: Food Safety Laboratory (FSL) Quantity: 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                                 |
| (i) The manufacturer of the product shall preferably ISO 9001 certified or equivalent. A copy of the certificate must be submitted for evaluation upon request.<br>(ii) Tenderer shall provide reference list of installation for the proposed model or similar series in <b>Annex E Performance Summary</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  | Yes/ No                         |
| <b>(M) Installation, commissioning &amp; warranty</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | Yes/ No                         |
| (i) LC system must be delivered, unpacked, assembled and fully commissioned within 2 months of tender award, with a minimum one year warranty including annual preventive maintenance, unlimited breakdown calls and on-site support services, supply of replacement part for hardware and software must be provided. The consumables required to perform the PM shall also be included at no additional charge.<br>(ii) Instrument must be delivered before 31 <sup>st</sup> March 2018.<br>(iii) Tenderer must be able to assist in the method transfer of fructose, glucose, sucrose and maltose to the LC system.<br>(iv) The Contractor shall bear the cost for the works carried out during the installation of the instrument if any.                                                                                               |  | Yes/ No                         |
| <b>(N) Option to purchase: 3-year Post warranty comprehensive maintenance services on an annual basis</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                 |
| (i) Tenderer shall also quote for 3-year post warranty comprehensive maintenance contract <b>on annual basis</b> for the instrument. The contract shall include: <ul style="list-style-type: none"> <li>a) Annual PM</li> <li>b) Unlimited breakdown calls during Office Hours i.e. 8:30 am to 6pm from Monday to Friday exclude Saturday, Sunday and Public Holidays</li> <li>c) Consumables that required to execute the PM</li> <li>d) Supply of replacement parts</li> <li>e) Software upgrades if any</li> <li>f) Provision of technical &amp; application support</li> </ul> (ii) The Contractor shall bill HSA on annual basis upon completion of each PM.                                                                                                                                                                          |  | Yes/ No                         |
| <b>(O) Application &amp; Technical support (on-site)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                                 |
| During warranty and post warranty contract coverage period, the tenderer must provide the following: <ul style="list-style-type: none"> <li>(i) Application and technical support ; and</li> <li>(ii) The Services to be performed i.e. Preventive Maintenance and Corrective Maintenance as described below.</li> </ul> <b>Preventive Maintenance:</b> <ul style="list-style-type: none"> <li>a) The Preventive Maintenance performed shall be in compliance with the maintenance procedures and safety tests specified by the manufacturer.</li> <li>b) The Preventive Maintenance shall be carried out during Office Hours.</li> <li>c) The Contractor shall give the Authority a minimum of three (3) days' notice before carrying out the Preventive Maintenance at the Authority's premises</li> </ul> <b>Corrective Maintenance</b> |  | Yes/ No                         |

| <b>Equipment 3: High Performance Liquid Chromatograph (HPLC) with CAD/<br/>ELSD/ QDA and DAD</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    | <b>Compliances<br/>Checklist<br/>(Yes/ No)</b> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>Location: Food Safety Laboratory (FSL)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Quantity: 1</b> |                                                |
| <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 on-site, within the response time of not more than 48 hours upon receipt of oral/written notification if the request is made on a Working Day,. If the request is made on a non-Working Day, the Contractor shall respond within the first forty-eight (48) hours of the beginning of the next Working Day.</p> <p>b) The Contractor shall attend to unlimited breakdown calls. 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 during Office Hours.</p> <p>c) The Contractor shall complete any repair, or replacement or adjustment of components within seven (7) working days from and including the date on which the Contractor was given notice pursuant to Clause-Corrective maintenance (a), unless the Authority had agreed in writing to have the time period extended.</p> |                    |                                                |

| <b>Equipment 3: High Performance Liquid Chromatograph (HPLC) with CAD/ ELSD/ QDA and DAD</b><br><b>Location: Food Safety Laboratory (FSL)                      Quantity: 1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Compliances Checklist</b><br><b>(Yes/ No)</b> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| <b>REPLACEMENT AND PURCHASE OF COMPONENTS</b><br><br>a) The Contractor shall inform the Authority of any part or component of the Equipment that needs to be replaced. Prior approval must be issued by 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.<br><br>b) 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Yes/ No                                          |
| <b>GUARANTEE</b><br><br>a) The Contractor hereby warrants that all the Equipment and every part or unit thereof serviced by the Contractor shall conform to the requirements of this Contract and be free from any defect or deficiency in their performance or workmanship for a period of three (3) months from the date of acceptance of the Services by the Authority (hereinafter referred to as "the Equipment Guarantee Period"). The Contractor hereby also warrants that all materials and every part or unit thereof, used for the Services shall be free from any defect in manufacture or any defect arising out of design, workmanship or materials used or any failure or malfunction due to quality of material, workmanship, design, assembly, installation or integration for a period of three (3) months from the date of acceptance of the materials by the Authority (hereinafter referred to as "the Materials Guarantee Period"). The Equipment Guarantee Period and the Materials Guarantee Period shall collectively be known as the "Guarantee Period".<br><br>b) Where during the Guarantee Period, any part or unit of the Equipment serviced by the Contractor or materials used for the Services or supplied therefor are found to be defective of any of the reasons specific in Clause Guarantee-(a) above, the Contractor shall at the written request of the Authority replace the same at the expense (including freight charges, transportation costs or other incidental charges) of the Contractor or if the Authority so agrees make good or repair the same at the expense (including freight charges, transportation costs and other incidental charges) within a Guarantee Turn-Around-Time of seven (7) working days. The Equipment or materials or part or unit thereof so replaced or repaired shall be subjected to the Guarantee under this Clause for the Authority or three (3) month whichever is later and such balance of the Guarantee Period shall begin to run only from the date of receipt of the part or unit so replaced or repaired by the Authority. | Yes/ No                                          |

### **COMPLIANCE OF REQUIREMENT SPECIFICATIONS**

I hereby confirm that I can meet all the specifications and requirements as stated in Part 3: Requirement Specifications – Equipment 3.

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

Tenderer's official  
Stamp:

Authorized Signature

Name:

Designation:

Please indicate any non-compliance to requirement specifications here should there be any.

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