MINUTES OF PRE BID MEETING

Tender for Supply, Delivery, Installation & Commissioning of Laboratory Equipment for Department of Science and Technology, Faculty of Science and Technology

Tender No : UWU/G/NCB/18/03
Date & Time : 30th May 2018 & 11.30 a.m.
Venue : Boardroom

The Following decisions were made at the Pre Bid Meeting

At the Pre Bids Meeting following clarification were made against the bidders' questions.

a. Changes in specifications – Specifications of following items were changed at the Pre Bid Meeting(Refer annexure for new specification)

Item No	Description	Reference Annexure
Laboratories: Chemistry and Materials		Annexure 01
1	Conductivity Meter	
4	PH Meter Bench top	
5	Water Bath	
Laboratories: Food Engineering and Bioprocess Technology Laboratory		
1	Analytical balance	
6	Bench top pH meters	
Laboratory: Petrology Laboratory		
1	Polarizing petrographic microscope	

Chairman
Procurement Committee,
Uva Wellassa University

Technical Specifications

Supply, Delivery, Installation & Commissioning of Laboratory Equipment for Department of Science and Technology, Faculty of Science and Technology
UWU/G/NCB/18/03

No	Item	Specifications	Qty	Bidders' Response
Laboratories: Chemistry and Materials				
1	Conductivity Meter	The Bench top Conductivity Meter Kit should include all the accessories needed to start testing in the Laboratory. It should include the meter probe, integrated magnetic stirrer (More preferable), electrode stand, standard calibration flasks and other accessories for quick start up. Meter should be water resistant to IP 42 standard. It should have a LCD display with backlight It should have automatic temperature compensation facility. It should have automatic conductivity standard recognition facility with standards 147 µS/cm, 1413 µS/cm, 12.88 mS/cm and 111.8 mS/cm Special calibration at any Conductivity, Salinity or TDS value should be possible. The meter should operate with mainspower supply, 230V,50 Hz. It should be supplied with Platinum sensor glass conductivity electrode. The electrode cable length should be at least 1 meter. It should read parameters: Conductivity, Salinity, Resistibility and Temperature. Specifications Conductivty Conductivity: 0.2 µS/cm to 200 mS/cm Resolution: 0.00 to 199.9 mS/cm (Auto Ranging) Salinity Range: 0 mg/L to 200 g/L Resolution: 0.0 to 1999 mg/L, 2.0 to 50.0 g/L Resistivity Range: 0 Ohm to 500 M ohm Resolution: 0.0 to 1999 mg/L, 2.0 to 50.00 g/l Temperature Range: 0-80 ^{0}C Resolution: 0.1 ^{0}C Accuracy: >0.3 ^{0}C Meter should comply with CE standard. Should have a good after sales service. Please attach details of after sales service personnel, their qualification, and address of after sales division etc. Documentary evidence of requested specifications should be provided by marking on manufacturer's literature. Letter of Authority required from manufacturer.	2	
2	Melting Point Apparatus	Melting-Point Meters with digital temperature controller Temperature range : ambient to 350 ^{0}C or better Accuracy : 0.3 ^{0}C or better Heating rate: 1 ^{0}C / minute of better Eye piece: 10x No. of capillary inserts: at leaset three capillaries Should have sealed keyboard for easy cleaning Should have integrated fan for automatic quick cooling Should have Safety classified at least IP20 Should have RS-232 interface for data transfering Power : 230 V/50Hz	2	

Deputy Bursar (Stores & Supplies)
Uva Wellassa University
Passara Road, Badulla.

3	Oven	Construction: The interior chamber should be made of stainless steel. The exterior cabinet should be made of heavy gauge steel with baked enamel finish. Insulation: It should have double-walled construction, and fiberglass insulation for good heat retention. Door gasket: Should be made of silicon to prevent heat loss. Shelves: It should include 2 stainless steel wire-rod shelves with adjustable shelf positions. Capacity: Not less than 100 Lts. Internal Dimension: Not less than 45x45x45 cm Display: Digital LED display Control System: Microprocessor system. Temperature range: Ambient +5 ^{0}C to 250 ^{0}C Temperature Resolution: 1 ^{0}C Temperature Accuracy: 0.1 ^{0}C at 180 ^{0}C Temperature Uniformity: ±3.0 ^{0}C at 180 ^{0}C Air Convection: Forced convection by Fan Timer: Digital Timerm10 Hrs (Approx)+Holding facility Safety: Over temperature alarm and cut-off device with audible and visible alarm Indicators: Indicators for power, Process Temperature value and Set Temperature value should be available Power: 230V;50 Hz Quality Standard: Should comply with ISO, CE, GMP Standards Warranty: Minimum 1 Year Documentary evidence of requested specifications should be provided by marking on manufacturer's literature.	1	
4	PH Meter Bench top	The benchtop pH Meter Kit should include all the accessories needed to start testing in the laboratory It sould include the meter, probe, integrated magnetic stirrer (More preferable), electrode stand, standards, storage solution , calibration flasks and other accessories for quick start up. Meter should be water resistant to IP 42 standard It should have a LCD display with backlight It should have Automatic Temperature Compensation facility It should have automatic buffer recognition facility with pH 2.00, 4.01, 7.00, 9.25 and 10.01 buffers. The meter should be operated with mains power supply 240V; 50Hz It should be supplied with refillable, glass combination electrode with , clog-free sleeve junction The electrode cable length should be at least 1 meter It should read parameters pH,mV and Temperature Specifications pH Range: 0-14 pH Resolution: 0.01 mV Range: ± 1999 mV Resolution: 0.1 mV Temperature Range: 0-60 ^{0}C Resolution: 0.1 ^{0}C Accuracy: >0.3 ^{0}C Compliance: CE compliance Should have a good after sales service. Please attach details of after sales service personnel, their qualification, and address of after sales division etc. Documentary evidence of requested specifications should be provided by marking on manufacturer's literature. Letter of Authority required from manufacturer.	5	

Deputy Bursar (Stores & Supplies)
Uva Wellassa University
Passara Road, Badulla.

5	Water Bath	Should be suitable for biological, clinical research, medical, bio chemical applicationsConstruction: Stainless Steel Molded (weld free) Square TankCapacity: 22 L or betterTemp. Contro: PID or better temperature controlTemp. Setting: Digital Temperature settingTemp. Read out: Digital Temperature read outTemp. Range: Ambient to 99.9 ^{0}CTemp. Stability : +0.01 ^{0}C or betterTemp. Uniformity: +0.01 ^{0}C or betterTimer: Timer should be available Power Supply: 230V, 50 HzHeater: Immersion type Heating Element with Temperature sensor and Water CirculatorShould be supplied with Standard Concentric rings, Spring Wire (test tube racks) and lid.Documentary evidence of requested specifications should be provided by marking on manufacturer's literature.	4	
6	Ice Flake Maker	Ice produced for 24 hours: up to 120 kg Condensing unit cooling Air or water: consumption n. 24 litres per hour Refrigerant : R134a External structure: inox Absorbed power: 480 W Power supply : 230 V, 50 Hz Storage bin capacity: 27 kg	1	
7	Centrifuge	Should have a microprocessor control system with LED display to indicate time and speed. Speed range should be 200 – 5000rpm or better. Rotor type should be fixed angle rotor and capasity atleast 15mlx16 positions Should have a timer with minimum of 99minutes or better. Should have automatic RPM/RCM conversion facility. Troubles detection and indication, imbalance detection should be available. Chamber should be stainless steel to easy for cleaning ensuring to be free from contamination Should have interlocking lid system, automatic braking system as safety features. Should have brushless induction drive for quiet operation and maintenance free. Should have indicators for Spin, Alarm, Lid Lock, SV, RPM, RCF Should have error detection for Rotor Imbalance,Driver overheat, Motor overheat, Disengaged Connector,Overload、、 Power should be 230V/50Hz. Should have international standards like ISO, CE, GMP and FDA. After Sales Services: Should have a good after sales service. Please attach details of after sales service personnel, their qualifications and address of the after sales division etc. Letter of authority required from the manufacturer. Documentary evidence of requested specifications should be provided by marking on manufacturer's literature.	2	
8	Vacuum oven and vacuum pump	Digital electronic control of: temperature, vacuum pressure and pre-selected pro-grammable timer. Temperature sensor Pt100 Automatic air inlet at the end of the operation cycle. Heating element placed evenly around the chamber. Chamber made of AISI 304 stainless steel. Trays made of anodized aluminum. Door with hardened glass window, which sits on to a silicon gasket that absorbs any contractions and expansions that may occur. Vacuum port with bleed valve. Air valve at the front. Vacuum pump connection at the back. Vacuum pump should be provided* (appropriate pump should be provided) Epoxy covered outer case. RS-232 Interface output for parameters to a computer, printer or USB adapter	1	

Deputy Bursar (Stores & Supplies)
Uva Wellassa University
Passara Road, Badulla.

Laboratories: Machatronics Laboratory				
16	Arc welding plant	• 200 MPA welding Inverter type • Rated Input power 7.7KVA • Output current adjusting range 20-200A • Rated output voltage 25V Voltage 220V	2	
17	Hand drill	• Codeless drill 18V • Two Li-ion Batteries • 20000 rpm • Forward reverse function • 0.8 – 10mm tools holding • Torque setting Plastic casing	1	
18	Hand grinder	• Capacity 2000W • Voltage 220V • 8000 RPM • 180mm Disk size • M 14 Thread	1	
19	3D printer	• Number of Extruders: 1 • Build Volume: 150 x 150 x 150 mm or similar • Layer Resolution: 0.1 to 0.3 mm • Nozzle diameter: 0.4 mm • Nozzle temperature: 250 ˚C MAX • Bed temperature: 100 ˚C MAX • Print File Type: .gcode • Power Requirements: 110-240 V AC, 250 W • Connectivity: SD card/USB • Filament: 1.75 mm • Printing Material: ABS, PLA • Filament colour: All	1	
20	Dividing Head For Milling (with accessories)	• 5" 3-jaw lathe chuck, • center&driving dog, threaded back plate & 3 dividing plates • 1:40 ratio. Direct index plate of 24 holes allow direct dividing in 2,3,4,6,8,12 & 24 Accessory plates	1	
21	Gas welding set	Set should contain • Torch Handle • Oxygen Regulator Acetylene Regulator • Cutting Attachment • Cutting Nozzle • Welding Nozzles • Twin Hose 15' x 1/4" Welding Hose • Tip Cleaner • Goggles • Spark Lighter • Spanner • Carrying Case • Manual	1	
22	Variable power supply	• Maximum Current Output 10 A • Maximum Voltage Output 30 V	10	
42	Dual Trace Oscilloscope	• Color, 17.8 cm (7 in) liquid crystal display • Multi-language, on-display menu • 50 MHz bandwidth • 1 GSa/s maximum sampling rate • 10 ns/div to 50 s/div time base • 2 mV/div to 10V/div vertical sensitivity • ±3% accuracy • USB and RS 232 ports	4	

Deputy Bursar (Stores & Supplies)
Uva Wellassa University
Passara Road, Badulla.

Laboratories: Food Engineering and Bioprocess Technology Laboratory				
1	Analytical balance	• Capacity: 60-120 g (should be within the range) • Readability: at least 0.1 mg • Reproducibility: ± 0.1 mg • Linearity: at least ± 0.07 mg • Response time: 2s or lesser • Tare range: full to capacity • Allowable Ambient Operating Temperature within the range : 10° C to 35° C • Pan size: 85 mm or higher • Display should be LCD Backlit • Calibration: Internal Automatic • Selectable Application Programs- Counting, Weighing in percent, Density determination, Peak hold, Unstable condition, Check weighing, Mixing, Conversion, Statistics, Components • Sensitivity Drift (10° - 35°C): ± 1.5 ppm / °C • Draft Shield Chamber Height (from pan to top of glass door)- 209 mm or higher • Interface: mini USB • Leveling: Manual with front level bubble with two front leveling feet • Balance should be featured with RS 232 output for directly connect to a printer • AC adapter should be provided with the balance • Electrical connection: 230 V/ 50 Hz compatible • Housing Design: Aluminum Die-cast base with coated ABS top housing • Interior and the exterior of the balance should be chemical resistance • Letter of authority required from the manufacturer • Documentary evidence of requested specifications should be provided clearly by making on manufacturer's literature where necessary. • Suggesting item should be a world reputed brand with at least ten years satisfactory sales record including in Sri Lanka • The proposed model should have been recently introduced to the market and should not be in phase out stage.	1	
2	Digital top loading balance	• Capacity shall not be less than 1500 g • Readability: 10 mg or better • Repeatability: at least 10 mg • Linearity: 20 mg • Stabilization time: 3s or lesser • External calibration function should be available • Pan size: Not less than 120 mm • Square draft shield with all glass panels including three sliding doors • Front mounted level indicator for easy viewing • The balance shall have RS-232 or better communication port • Weigh below hook shall be available for density measurement • The balance should have stability indicator • Auto tare facility • CE and ISO certificates should be available • Interior and the exterior of the balance should be chemical resistance • Letter of authority required from the manufacturer • Documentary evidence of requested specifications should be provided clearly by making on manufacturer's literature where necessary. • Suggesting item should be a world reputed brand with at least ten years satisfactory sales record including in Sri Lanka The proposed model should have been recently introduced to the market and should not be in phase out stage	1	

Deputy Bursar (Stores & Supplies)
Uva Wellassa University
Passara Road, Badulla.

3	Digital Vortex mixture	• Usage: used commonly in laboratories to mix small vials of liquid • Speed range: should be within 500 to 3000 rpm • Orbit: at least 4.9mm • Controls: 3-way power switch, LED display for time/speed, up/down keys for set-point control • Overall dimensions (L x W x H): at least 4.8 x 6.8 x 4.8"(12.2 x 17.3 x 12.2cm) • Continuous or touch modes • Microprocessor controls • LED display for speed and time • Letter of authority required from the manufacturer • Documentary evidence of requested specifications should be provided clearly by making on manufacturer's literature where necessary. • Suggesting item should be a world reputed brand with at least ten years satisfactory sales record including in Sri Lanka • The proposed model should have been recently introduced to the market and should not be in phase out stage. • The proposed model should be recently introduced to the market	2	
4	Magnetic stirrer with hot plate	• Speed control range: 250-1250 RPM (should be within the range) • Max. stirring volume (water): 15 litres or better capacity • Plate temperature regulation range: +30°C...+330°C or better range • Temperature uniformity on the plate: ±3°C • Working plate heating time till 330°C: 15 min • Diameter of working plate: at least 160 mm • Working surface material: Aluminium alloy • The entire stirrer should be made out of a material with chemical and corrosive resistant • Attachable stand size: not more than Ø 8 × 320 mm • Length of magnetic stirring element: 10–50 mm • Max. stirring liquid viscosity: up to 1170 mPa.s • Fault indication: Outputs sound signal and turns off the heating • Overall dimensions (W×D×H): not more than 190x270x100 mm • Weight: not more than 2.9 kg • Nominal operating voltage: 230 V; 50/60 Hz compatible • Power consumption (Stirring): not more than 8.5 W • Power consumption (Heating): not more than 550 W • Letter of authority required from the manufacturer • Documentary evidence of requested specifications should be provided clearly by making on manufacturer's literature where necessary. • Suggesting item should be a world reputed brand with at least ten years satisfactory sales record including in Sri Lanka • The proposed model should have been recently introduced to the market and should not be in phase out stage. • The proposed model should be recently introduced to the market	1	

Deputy Bursar (Stores & Supplies)
Uva Wellassa University
Passara Road, Badulla.

5	Bench top Glassware Drying cabinet	• Capacity should be 250 - 400 liters • Exterior should be stainless steel and epoxy coated finish • Interior should be stainless steel • Exterior and interior should be chemical resistant • Adjustable shelves should be available and four shelves should be available. • Maximum temperature should be up to 140°C • Over temperature protection should be available • Safety devices Built-in thermostat and ELCB. Fitted with temperature alarm to avoid overheating. • Sliding, toughened glass doors should be available. Door type Glass door with magnetic gasket for easy viewing of drying stocks. • Chamber thermal isolation by a mineral wool panels coating • Drying chamber coating in poish stainless steel AISI 304 • All levels are equipped with fully extendable telescopic bearing rails made of AISI 304 stainless steel with safety lock for the end position of extraction of the drawers • Drying circuit dedicated to a homogeneous heat distribution inside the storage chamber served by a blower • Partial air recirculation should be available to reduce energy consumption • 4.0 kW heating elements provide up to 140°C (184°F) air • Dryer blower flow rate up to 250 m3/h (8.828 ft3/h) • Temperature display Digital, display up to 0.1oC • Timer should be Built-in 999-minutes timer. • Interior dimensions (mm)- at least 620 W x 625 D x 1190 H • Exterior dimensions (mm) – at least 880 W x 705 D x 1635 H • Electrical supply220-240 VAC, 50 Hz compatible Letter of authority required from the manufacturer • Documentary evidence of requested specifications should be provided clearly by making on manufacturer's literature where necessary. • Suggesting item should be a world reputed brand with at least ten years satisfactory sales record including in Sri Lanka The proposed model should have been recently introduced to the market and should not be in phase out stage	1	

Deputy Bursar (Stores & Supplies)
Uva Wellassa University
Passara Road, Badulla.

6	Bench top pH meters	• pH meter kit should include all the standard accessories needed to start testing in the Laboratory • It should include buffers, standards, storage solutions, calibration tubes and accessories for quick start up. • Meter should be water resistant to IP 67 standard • It should have a LCD display with backlight • It should have automatic temperature compensation facility and automatic buffer recognition facility with pH 2.01, 4.01, 7.00, 9.21 and 10.01 buffers • The meter should be operated with AA batteries • Power adapter should be also provided to operate the meter using AC electricity • It should have gel filled pH glass combination electrode • The meter should read parameters pH, mV and temperature • Electrode cable length should be at least 1 meter • Electrode stand, universal power adapter, literature CD, printed quick start guide, computer interface cable and meter test certificate should also be provided with the meter pH • Range (pH): 0-14 pH • Resolution (pH): 0.01 or better • Accuracy (pH): ±0.02 pH or better Temperature • Range (Temperature): 0 to 100° C • Resolution (Temperature): 0.1°C or better • Accuracy (Temperature): ±0.1°C or better mV • Range (mV): 0 to 2000.0 mV • Resolution (mV): 0.1mV • Accuracy (mV): ±0.2 mV • Iron electrode • Compliance- Meter should comply with CE standard • Warranty period of one year or more is required • Letter of authority required from the manufacturer • Documentary evidence of requested specifications should be provided clearly by making on manufacturer's literature where necessary. • Suggesting item should be a world reputed brand with at least ten years satisfactory sales record including in Sri Lanka The proposed model should have been recently introduced to the market and should not be in phase out stage.	3	
7	Grinder	• Function: Capable for wet and dry grinding • No of jars: Minimum 2 • Material type of jars: Material: Stainless steel or unbreakable liquidizing jars • Power: 500 W – 1000 W • Voltage: 220- 240V, 50Hz • No of blades: Minimum 3 • Material type of blades: Stainless steel • At least 2 year warranty period is required • After sales services: should have a good after sales service. Please attach details of after sales service personal, their qualifications and address of the after sales division etc. • Letter of authority required from the manufacturer • Documentary evidence of requested specifications should be provided by making on manufacturer's literature • Should be a world reputed brand and should contain at least 10 years acceptable working records including in Sri Lanka The proposed model should be recently introduced to the market	1	

Deputy Bursar (Stores & Supplies)
Uva Wellassa University
Passara Road, Badulla.

8	Standard bench-top freeze drier with vacuum pump (complete system)	• Condenser capacity : in the range of 3-4 Kg • Condenser temperature: -55oC/-85oC • Condenser performance: at least 3-4 Kg/24 hours • Vacuum degree : should be <10Pa • Water capturing capacity: 3Kg/24h • 3 or 5 unheated shelves should be available • material loading capacity/shelf - 300 mL or better • 8-12 ports should be available • acrylic drying chamber should be available • -55oC for drying of aqueous products -85oC for drying solvents with low eutectic points • Display of vacuum, sample temperature, ice condenser temp • runtime vacuum control option • RS232 communication port. • Attachments for ampoules, round bottomed flasks, wide-necked filter bottles • Chemical resistivity for condenser • Consumption - 1000 W • Power supply - 230V, 50 Hz/60Hz • Standard accessory - main body, vacuum pump, manifold drying cabinet, drying bottles (8-12) • At least 2 year warranty period is required • After sales services: should have a good after sales service. Please attach details of after sales service personal, their qualifications and address of the after sales division etc. • Letter of authority required from the manufacturer • Documentary evidence of requested specifications should be provided by making on manufacturer's literature • Should be a world reputed brand and should contain at least 10 years acceptable working records including in Sri Lanka • The proposed model should be recently introduced to the market	1	
9	Diaphragm Vacuum Pump for rotary evaporator	• For air, gases and vapors • Delivery (l/min): 20 • Ultimate vacuum (mbar abs) 7 • operating pressure (bar g) 1 • Connectors for tube (mm): OD 10 • Permissible gas and ambient temperature - +5oC-+40oC • Voltage/frequencies 230V, 50 Hz860Hz • Power p, 180 W • Weight: 9.3 Kg • Dimensions (appox) 300x200x250 • 100 % oil-free transfer • Pure transfer, evacuation and compression • highly compatible with vapors and condensation Chemical resistant • suitable for highly aggressive and corrosive gases and vapors • Maintenance free • Environmental friendly • At least 2 year warranty period is required • After sales services: should have a good after sales service. Please attach details of after sales service personal, their qualifications and address of the after sales division etc. • Letter of authority required from the manufacturer • Documentary evidence of requested specifications should be provided by making on manufacturer's literature • Should be a world reputed brand and should contain at least 10 years acceptable working records including in Sri Lanka • The proposed model should be recently introduced to the market	1	

Deputy Bursar (Stores & Supplies)
Uva Wellassa University
Passara Road, Badulla.

10	Rotary evaporator	• Rotation Speed- should within the range- 20-260rpm • Rotation Speed Display- LCD • Titled Ange- l0-60° • Motor Power- at least 40W • Stroke Displacement- at least 160mm • Lifting- Motor • Temp. Range- Ambient – should be 180° • Bath Material- SSL with PTFE Coating • Temp. Controller Display- LCD • Temp. Controller Mode- P.I.D. • Temp. Control Accuracy- ±1°C(Water) and ±2°C (Oil) • Heating Power- 1300W • Bath Capacity- 5L or higher • Bath Diameter- 250mm or higher • Evaporation Volume- 50-3000mL (should be within the range) • Condenser Type- Vertical • Cooling Surface cm2- 1200 or higher Protection class- IP20 • Ambient Temperature- 0°C to 4°C • Dimensions- (L×W×H) Inch (at least) - 15×14×28 • Voltage- 230V, 50/60Hz • High-temperature-tolerant and high-quality glass. • After sales services: should have a good after sales service. Please attach details of after sales service personal, their qualifications and address of the after sales division etc. • Letter of authority required from the manufacturer • Documentary evidence of requested specifications should be provided by making on manufacturer's literature • Should be a world reputed brand and should contain at least 10 years acceptable working records including in Sri Lanka • The proposed model should be recently introduced to the market	1	
11	Fraction collector (for chromatographic separations)	• An easy to use type • Time or drop collection mode • Collection of 1 drop (50 microliter) to 9 mL fractions in 80 test tubes or microtubes (with optional adaptor) • Small chromatography columns can be mounted to drop-forming arm to minimize dead volume • Manual-advance tube changes • Cold room compatibility • Small footprint of 24x33 cm • Eighty 13x100 mm glass, polypropylene or polystyrene test tubes • 1-999 drops in 1 drop increments, 0.05-9.99 min in 0.01 min increments, 10.0-99.9 min in 0.1 mm increments • Case and carousel, polypropylene, front panel, hard coated polycarbonate • Drop former-silicone rubber • waste outlet tube - polyurethane • Operating temperature -4-40 oC • Safety certifications • Dimensions (WxDxH)- 24x33x25 cm • 230V, 60 Hz • At least 2 year warranty period is required • After sales services: should have a good after sales service. Please attach details of after sales service personal, their qualifications and address of the after sales division etc. • Letter of authority required from the manufacturer • Documentary evidence of requested specifications should be provided by making on manufacturer's literature • Should be a world reputed brand and should contain at least 10 years acceptable working records including in Sri Lanka • The proposed model should be recently introduced to the market (Standard Accessories are required)	2	

Deputy Bursar (Stores & Supplies)
Uva Wellassa University
Passara Road, Badulla.

Laboratory: Mineral Processing Laboratory				
1	Hydrocyclone	Laboratory Scale Hydrocyclone Test Rig: Stand Alone unit with its own sump, pump, piping, valves, motor, starter etc. Suitable for fitting and operating hydrocyclone for different sizes. The hydrocyclone is to be provided with a range of vortex finders, spigots and also body extension to permit variation of performance.	1	
2	Humphrey Spiral	Gravity Separator, Max Dimension(L*W*H) = 600*600*2500 mm, Stand Alone unit with its own piping, valves	1	
3	Shaking Table	Gravity Separator, Max Dimension(L*W) = 900*1500 mm, Stand Alone unit with its own sump, pump, piping, valves, motor, starter etc.	1	
4	Laboratory-scale Froth Flotation Unit	lab froth flotation, Volume: max 1L, Max Dimension(L*W*H): 600X300X650mm	1	
Laboratory: Petrology Laboratory				
1	Polarizing petrographic microscope	• Stand - Upright microscope stand with integrated transmitted light illumination (5-position nosepiece, stage drive right; POL version has 4-position centerable nosepiece) • Axis Type - 10X/20mm • Eye pieces - E-PL 10x/20 Br. Foc, PL 10x/22 Br. Foc, PL 10x/22 Br.I foc, Pol PL 16x/16 Br. foc • Objective Types - 5x, 10x, 20x, 40x, 100x oil A-Plan • Nosepiece - 4 pos. centerable, for brightfield and polarization • Design Type - Right-handed mechanical, Eyepiece - 10X, 20mm E-PL • Contrasting techniques—Brigh tfield, dark field, phase contrast, simple polarization contrast, fluorescence contrast • Illumination - Halogen reflector lamp HAL 35 / 12V 35W optional LED (daylight, warmlight) • Focus drive Manual, coaxial coarse/fine drive, 30 mm travel range • Bertrand system – Included with stand, focusable • Depolarizer - Included with stand • Specimen stage - 360° Pol rotary stage, with clips and vernier Hard-anodized surface, with 2 spring clips • Power supply unit - Built-in power supply 12V DC 50W stabilized, 100...240V AC/50...60Hz/110VA • Camera - Sensor: 5 MP CMOS sensor, Resolution: 2560 (H) x 1920 (V) = 5.0 megapixels, Pixel size: 2.2 µm x 2.2 µm, Interfaces: 1x SD card slot, 1x mini USB 2.0, 1x AV, (S-Video), 1x DVI (HDMI), Optical connection: C-mount Quarts, gypsum, mica accessory plates to be quoted optionally	4	
2	Geologic Compass	Hinge clinometer - 1° increments for 1/2° readable dip measurements, Azimuth accuracy +/- 1/2° with 1° graduations, Vertical angle accuracy +/- 1/2° with 1° graduations and 10 minute vernier, Vertical angle measurements to +/- 90° or 100% grade, Adjustable needle locking mechanism, Sapphire jewel bearing for needle movement, Magnetic declination settings to +/- 180°, Single NdFeB magnet, Covered hinge assembly, Percent grade scale with increments of 5%, Induction dampened needle for quick, accurate readings, Precision aligned mirror, Aluminum billet body assembly makes the GEO nearly indestructible, Ball & socket tripod mount for increased accuracy of rotation, Waterproof, Leather case	2	
3	Geologic Hammer	Big face Rock Pick, Square Head,Light weight, Solid Steel, Larger striking face, reduces shock type.	2	

Laboratory: Water Laboratory				
1	Bench top pH, Oxidation Reduction Potential (ORP), Dissolved Oxygen (DO) Meter with probes	Separate Electrodes with compatible sockets pH Temperature Compensation - automatic or manual Probe cable – 0.5 m long with proper covering Water proof connectors/connections for all pH Range - 2.000 to 20.000 pH pH Resolution - 0.1, 0.01, 0.001 pH pH Accuracy (@25ºC) - ±0.1 pH, ±0.01 pH, ±0.002 pH ±1 LSD pH Calibration - automatic recognition of standards up to five point calibration, eight standard buffers (1.68, 3.00, 4.01, 6.86, 7.01, 9.18, 10.01,12.45) or five custom buffers pH Temperature Compensation automatic or manual from -20.0 to 120.0 °C mV Range - ±2000 mV mV Resolution - 0.1 mV mV Accuracy - ±0.2 mV ±1 LSD Relative mV Offset Range - ±2000 mV or better mV Range - ±600.0 mV or better mV Resolution - 0.1 mV or better mV Accuracy - ±0.5 mV or better ORP Range - ±2000.0 mV or better ORP Resolution - 0.1 mV or better ORP Accuracy - ±1.0 mV or better ORP Calibration automatic at one custom point (relative mV) or please specify DO Range - 0.0 to 500.0%; 0.00 to 50.00 ppm (mg/L) DO Resolution - 0.1%; 0.01 ppm (mg/L) DO Accuracy - 0.0 to 300.0% saturation: (please specify) DO Calibration - automatic one or two points at 0 and 100% or one custom point Atmospheric Pressure Range - 600.0 to 1133.2 mbar or 8.702 to 16.436 psi Temperature Range - 5.00 to 55.00 °C Temperature Resolution - 0.01 °C Power supply: Both battery and electric power through power supply unit/adapter. Battery Type: 1.5V AA batteries preferred Display – LCD or Digital with energy saving Operating Temperature - 0 to 50°C Buffer solutions and electrode cleaning/filling solutions should be included Warranty – Please specify	5	
2	Bench top Electric Conductivity (EC) meter	EC Range - 0.000 to 1000.0 mS/cm EC Resolution - 0.001 µS/cm, 0.01 µS/cm, 0.1 µS/cm, 1 µS/cm, 0.001 mS/cm, 0.01 mS/cm, 0.1 mS/cm EC Accuracy (@25ºC) - ±1% of reading (±0.01 µS/cm) EC Calibration - automatic standard recognition (0.000 µS/cm, 4.00 µS/cm, 1.413 mS/cm, 5.000 mS/cm, 12.88 mS/cm, 80.00 mS/cm, 111.8 mS/cm) or user standard; single point or multi-point calibration Temperature Range - 5.00 to 55.00 °C Temperature Resolution - 0.01 °C Power supply: Both battery and electric power through power supply unit/adapter. Battery Type: 1.5V AA batteries preferred Display – LCD or Digital with energy saving Operating Temperature - 0 to 50°C Buffer solutions should be included Probe cable – 0.5 m long with proper covering Water proof connectors/connections Warranty – Please specify	5	

Deputy Bursar (Stores & Supplies)
Uva Wellassa University
Passara Road, Badulla.

3	Benchtop Turbidity meter	Measurement Method: Nephelometric (NTU) NTU Range: 0 – 4000 (Ratio on), 0 - 40: (Ratio off): Accuracy - Ratio on: ±2% of reading plus 0.01 NTU from 0 - 1000 NTU, ±5% of reading from 1000 – 4000 NTU Resolution - 0.01 NTU, 0.1 NTU, 1 NTU Range Selection – Automatic Repeatability - ±1% of reading or 0.01 NTU, whichever is greater (under reference conditions) Calibration – 5 point calibration or better (please specify) Light source – Tungsten filament or IR LED or Laser (please specify) Light Detector – Silicon photocell or better (please specify) Reading Modes: Single, average and continuous Quick response time (please specify) Sample Cell - borosilicate glass with rubber-lined screw caps Sample cell size – please specify Sample cell volume – minimum 25 mL If cell is smaller, please provide a cell adapter Operating Temperature Range: 0 - 50 °C Power supply: Electric power through power supply unit/adapter. Battery power also preferred. Battery Type: 1.5V AA batteries preferred Display – LCD or Digital with energy saving Standard solutions should be included with additional sample cuvettes Warranty – Please specify	4	
4	Portable pH, ORP, DO meter with probes	Separate Electrodes or All in One Electrode pH Range - 0.00 to 14.00 or better pH Resolution - 0.01 pH or better pH Accuracy - ±0.02 pH or better pH Temperature Compensation - automatic pH Calibration automatic - one, two, or three points with automatic recognition of five standard buffers (pH 4.01, 6.86, 7.01, 9.18, 10.01) or one custom buffer Probe cable – 1 m long with proper covering Water proof connectors/connections mV Range - ±600.0 mV or better mV Resolution - 0.1 mV or better mV Accuracy - ±0.5 mV or better ORP Range - ±2000.0 mV or better ORP Resolution - 0.1 mV or better ORP Accuracy - ±1.0 mV or better ORP Calibration automatic at one custom point (relative mV) or please specify DO Range - 0.0 to 500.0%; 0.00 to 50.00 ppm (mg/L) DO Resolution - 0.1%; 0.01 ppm (mg/L) DO Accuracy - 0.0 to 300.0% saturation: (please specify) DO Calibration - automatic one or two points at 0 and 100% or one custom point Atmospheric Pressure Range - 600.0 to 1133.2 mbar or 8.702 to 16.436 psi Temperature Range - 5.00 to 55.00 °C Temperature Resolution - 0.01 °C Battery Type: 1.5V AA batteries preferred Display – LCD or Digital with energy saving Operating Temperature - 0 to 50°C Buffer solutions and electrode cleaning/filling solutions should be included Warranty – Please specify	2	

Deputy Bursar (Stores & Supplies)
Uva Wellassa University
Passara Road, Badulla.

5	Portable Electrical Conductivity (EC) Meter with probe	EC Range - 0 to 400 mS/cm EC Resolution - auto ranging: 1 µS/cm from 0 to 9999 µS/cm; 0.01 mS/cm from 10.00 to 99.99 mS/cm; 0.1 mS/cm from 100.0 to 400.0 mS/cm; (please specify) EC Accuracy ±1% of reading or ±1 µS/cm whichever is greater (Or better) EC Calibration -automatic single point, with six standard solutions (84 µS/cm, 1413 µS/cm, 5.00 mS/cm, 12.88 mS/cm, 80.0 mS/cm, 111.8 mS/cm) or custom point Probe cable – 1 m long with proper covering Water proof connectors/connections Temperature Range - 5.00 to 55.00 °C Temperature Resolution - 0.01 °C Battery Type: 1.5V AA batteries preferred Display – LCD or Digital with energy saving Operating Temperature - 0 to 50°C Buffer solutions should be included Warranty – Please specify	2	
6	Portable Salinity Meter with probe	Salinity Range - 0.00 to 90.00 PSU Salinity Resolution - 0.01 PSU or better Salinity Accuracy ±2% of reading or ±0.01 PSU whichever is greater Salinity Calibration - based on conductivity calibration Seawater σ Range - 0.0 to 50.0 σt, σ_0, σ_{15} Seawater σ Resolution - 0.1 σt, σ_0, σ_{15} Seawater σ Accuracy ±1 σt, σ_0, σ_{15} Seawater σ Calibration - based on conductivity or salinity calibration Probe cable – 1 m long with proper covering Water proof connectors/connections Temperature Range - 5.00 to 55.00 °C Temperature Resolution - 0.01 °C Battery Type: 1.5V AA batteries preferred Display – LCD or Digital with energy saving Operating Temperature - 0 to 50°C Buffer solutions should be included Warranty – Please specify	2	
7	Laboratory Incubator	System - Forced convection for Biological Oxygen Demand (BOD) testing Operating temperature range - 0 – 60 °C Setting temperature range - 5 – 60 °C Temperature adjustment range - ±0.2, 0.3, 0.5 °C Temperature distribution accuracy - ±0.5, 2.0 °C Time to attain max. temperature – 15 -30 mins. Or better Time to attain min. temperature - 30 -45 mins. or better Cooling Mechanism - Continuous Operation, Cycle Operation, Cooling-Stop Operation Interior/ Exterior - Stainless steel plate / Chromate-free electrogalvanized steel plate or better, please specify Heat insulator - Styrene foam (non-freon) Defrosting mechanism – Automatic, Hot Gas Bypass Method, please specify Blower fan - please specify Heater / temperature detector - please specify Temperature control system - please specify Temperature control display - LCD/LED panel Operation functions - program operation, auto start, auto stop, quick auto stop Calibration: please specify Safety Functions - Self diagnostic function (temp. sensor error, heater disconnection, SSR short-circuit, main relay error, automatic overheat prevention function), key lock, Over current ELB, overheat preventative device, Fan malfunction detector, Cooling high-pressure detector, Inverter malfunction detector, or better, please specify Standard Internal Volume 250 L Shelf load capacity 15 kg No. of internal shelf stages – Minimum 5, stainless steel Power supply - (50/60) Hz rated current AC 240V Warranty - please specify	1	

Deputy Bursar (Stores & Supplies)
Uva Wellassa University
Passara Road, Badulla.

8	Analytical balance (Laboratory)	Maximum Capacity -120 g Readability - 0.01 mg; 0.1 mg Pan Size - 8 cm diameter or please specify Internal Calibration – Automatic, please specify Draftshield – Included Access – 2 sides and top Display – LCD or better Functions – standard function buttons or better In-use cover Included Linearity - ± 0.1 mg or better Pan Construction Stainless Steel Repeatability (typical) 0.015 mg Stabilization Time 8 s or better Tare Range - please specify Units of Measurement , Gram, Carat Working Environment 20 – 50 °C Compatible humidity – please specify Power supply: Electric power through power supply unit/adapter. Warranty – please specify	1	
9	Top loading balance (Laboratory)	Maximum Capacity - 600 g, please specify Readability - 0.01 g or better Repeatability - 0.007 g or better Minimum Weight - 14 g or better Linearity - ± 0.03 g or better Settling Time 2 s Temperature accuracy - (±) 10 ppm/°C Resolution 0.01 g Weighing Pan Diameter – Please specify Adjustment External Display - LCD Functions – standard function buttons or better Housing Plastic ABS/PC Power - AC Power supply and battery operation. Electric power through power supply unit/adapter.	4	

Deputy Bursar (Stores & Supplies)
Uva Wellassa University
Passara Road, Badulla.