المواصفات الفنية للأجهزة المطلوبة

1	**Amino acid Analyzer** **Descriptions**	
	System performance • by protein hydro lysate analysis method • Analysis time: 30 min (Net) • Resolution (JP): 1.2 (Thr-Ser, Gly-Ala, Ile-Leu) • Reproducibility of peak retention time :Max RSD 0.5% • Reproducibility of peak area: Max RSD 1.0 % • Detection limit: 2.5 pmol **Analyzer** • Column Size: 4.6 mm × 60 mm • Resin: custom ion exchange resin **Pump** • Flow rate setting: 0.001 - 1.000 ml/min • Discharge pressure: 0 - 35 MPa • Gradient elution method: with 6 solutions **Autosampler** • Injection method: Direct injection method • Sample vial capacity: 1500 µL • No. of vials accommodated: 120 cooling unit • Sample injection volume: 0.5 - 100 µl **Column oven** • System: Peltier • Temperature setting: 10 - 100 °C (in 1 °C steps) **Reaction unit** • System: Electronic heating • Temperature setting: 40 - 150 °C (in 1 °C steps) **Detector** • Spectrophotometer: Aberration-corrected • concave diffraction grating • Wavelength: **570 nm, 440 nm.**	

2	**Double beam UV/Vis Spectrophotometer**	
	Descriptions	
	General • High scanning speed, double beam UV/Vis spectrophotometer. • Instrument Equipped with 1X8 motorized movable path length cell holder (min 1X4 motorized movable path length cell holder) • **2 Pairs of Quartz standard cells** (10mm*10mm) included. • Brand name Laptop and printer included. **Optical Features:** • True double beam optics • Czerny-Turner style monochromator with holographic grating. • Fixed 1.5 nm slit. • Silicon photodiode detector. • Reflective optics with quartz over coating. • Automatic lamp peaking and wavelength calibration. • Automatic source changeover at selectable wavelength. • Tungestin-halogin lamp and deuterium lamp. • Wavelength range: 190: 1200 nm. **Performance** • Stray light: <0.0008. • Wavelength Accuracy: ± 0.01nm. • Wavelength reproducibility: ± 0.02 nm. • Photometric Accuracy: Maximum ± 0.0008. • Photometric repeatability: Maximum ± 0.00007. • Photometric Noise: <250 µA RMS. • Photometric Drift: < 100 µA/h. • Photometric Linearity: < 0.5%. • Baseline Flatness: < 0.001. **Software features** • Many application included such as • General, Quantify and Kinetics. • DNA and Protein analysis. • Colour and Scripting application. • System Validation. • Fixed wavelength measurement (single or multiple wavelengths). • Wavelength scanning. • Time scanning and standard curve fitting. • Spectrum transformation. • Full Quality control Parameters. • Fully integrated system.	

3	**Galvanostat / Potentiostat** **Descriptions**	
	General: • Galvanostat, Potentiostat and Impedance instument • Maximum current: ± 500 mA. • Compliance voltage: ±20 V. • Max applied potential: ±15 V. • Voltage range: ±15 V. • Potential accuracy: < 0.1 % FSR (Full Scale Range). • Potential resolution: 0.003 % FSR. • Maximum scan rate: 200 V/s • Current ranges: 9 (14 with low current probe). • Standard board: ±5 nA to ±500 mA. • Current option: 1 pA to 10 nA. • Current accuracy: < 0.1 % FSR (Full Scale Range). • Current resolution: 0.003 % FSR. • Input impedance: 10 GΩ (//20 pF). • Interfaces: USB2.0. • Acquisition time: >100 µs. • IR Compensation: static manual and static automatic. • Electrodes connections: 2, 3 and 4. • A/D Converter: 16 bits. • EIS Capability: 10 µHz to 5 MHz. • Analog I/O: Yes, 1. • Analog filter: 1 µs to 1 s. • Temperature control: -10°C to 105°C • Suitable Software.	
	Accessories Electrodes: • Ag/AgCl Reference Electrode. • Calomel Reference Electrode. • Pt-sheet counter Electrode. • Working Electrode PEEK shaft. • Glassy carbon tip 5mm. Cells: • 250 ml water jacet cell with stand. • Microcell Kit **Brand name Laptop and Printer**	

Methods Included

Voltammetry:

- Pot. Cyclic (CV), Pot. Advanced Cyclic, Gal. Cyclic, Pot. Linear, Pot. CV 4 limits, Pot. Interactive CV, Staircase Voltammetry (SCV).

CHRONO:

- Open Circuit potential (OCP), Chrono Amperometry (CA), Chrono Amperometry Expert, Chrono Colourmetry (CC), Chrono Potentiometry (CP), Chrono Potentiometry Expert, Interactive Potentiometry, Single Chrono Amperometry.

Impedance:

- Pot. Dynamic EIS, Pot. Fixed Frequency EIS (Capacitance), Gal. Dynamic EIS.

Corrosion:

- Pitting corrosion, General corrosion (Rp), Coupled corrosion (Evans), polarization for corrosion (Tafel), Zero Resestance Ammeter (ZRA)

Pulse:

- Pot. Differential pulse (DPV), Gal, Recurrent Differential pulse, Pot. SW Voltammetry, Potentiometric Stripping Analysis (PSA).

Butteries & Super Capacitors:

- Single Charge and Discharge, Gal. Charge and Discharge Cycle, Expert Charge and Dis Charge Cycle, PITT, GITT, Constant Pot. Profile Generator, Internal Resistance.