Required specifications

1. **Four Probe Set-Up for measuring the resistivity of very low to highly resistive thin sheet samples at different temperatures**

   The setup should be complete in all respects and capable of performing the following experiments

   a. Study the variation of resistivity of a semiconductor with temperature and hence to determine the Band Gap
   b. To study conductivity of thin film by four probe method.

   The set-up must consist of the following

   a. Four Probe Arrangement with built-in thermocouple sensor
   b. Standard Samples: Ge, Si and Aluminium
   c. Temperature control unit (preferable in the range -80 to 2oo degree)
   d. High Performance PID Controller
   e. Control Unit of Four Probe Setup

   Essential features:
   Individually Spring-Loaded Contact, Replaceable Probe Tips, Spring Loaded Sample Holder, Stainless Steel Probe Holder, Able to take sample up to min. 10mm Dia, Constant Current, Suitable for Polymer sample, Suitable for (semi)conductors, Ramp Function in Temperature Controller, Metal Cabinet for shielding, Plastic Moulded Frames

   Specifications
   Display Accuracy of Temperature Controller, degree celcius: 0.3
   Input Impedance of Voltmeter, (Megaohm): 1000
   Current Range, mA: 0-200
   Max Sample Size Diameter: 20 millimeter
   Oven Type: Fast Cooling
   Probes Tip Diameter: 0.25 millimeter
   Temperature control: Digital
   Temperature readout: Digital
   Probe Insulation: Teflon
   Resistivity Measurement Range, (ohm.cm): 10(-6) to 10(+8)
   Least count of constant current Source, (nA): 1
   Accuracy of Temperature Controller, degree celcius: 0.1
   Temperature sensor: Digital
   Oven temperature Range, (degree Celicius): preferable in the range -80 to 200
   Least count of voltmeter, (Volt): 10(-6)

2. **GM counting system**
   The setup should be complete in all respects and capable of performing the following experiments

   a. Determine the resolving time of the GM counting system.

b. Study and determine the statistical distribution low that governs nuclear decay.
c. Determine the characteristics of a GM tube to study the variations of count rate with applied voltage and thereby determine the plateau, the operating voltage and the slope of the plateau.
d. Determine the dead time of the GM tube using a single source

Specifications
GM Input Polarity: Negative
GM Input Amplitude: 500 mV (min)
Resolving time: 6 micro sec. (approximately)
EHT output: Variable EHT using ten turns pot up to a maximum of 1500 volts at 1 mA. Line and load regulation better than 0.05%.
Display: 20 X 2 LCD dot-matrix display to indicate data counts, Elapsed time and EHT
Counts capacity: 999999 counts
Preset time: 0 - 9999 seconds
Data storage: Up to 6665 readings
Command Buttons: START, STOP, PROG, STORE, INC & DEC command buttons.
Programmability: Includes selection of preset time, storing/ recalling of data, starting and stopping of acquisition.
GM Socket: MHV connector for connecting to GM Detector.

The set-up must include following accessories:
a. End Window GM Detector Stand
b. End Window GM Tube
c. Radioactive Source Kit
d. Aluminium Absorber Set
e. Lead Castle