$$P = VI \quad (2)$$

Where P is power, I is current and V is the voltage of a system. The energy of one electron is the charge of an electron (i.e. the current flow of one electron per second in amps) times the voltage. Using this knowledge we then form the equation:

$$E = eV \quad (3)$$

Where $e = 1.6X10^{-19}$ C.

We then solve equation(1) for h and replace the E term with the equivalent of E in equation (3), as well as replace v with: $v = c/\lambda$

Where $c = 3X10^{8}$ m/sec. We then get:

$$h = \frac{eV\lambda}{c} \quad (4)$$

It is this equation that we will use to determine Planck's constant.

Procedure: 1. Connect the LED to the jack provided on the front panel and switch on the unit.

2. Take the different voltage and current measurement of LED (as tabulated below) for V-I characteristics of LED.

S.No.	Voltage (V)	Current (mA)
I		

3. Take different LED's and follow step 2.

4. Now plot the V-I characteristics of all the LED's on graph paper and takes voltages corresponding to a constant current based on observation taken in step 2. Draw the line parallel to y-axis and note down values of voltages corresponding to different LED's.

5. Make the table as shown below.

S.No.	LED colour	Voltage (Volts)	Wavelength λ (nm)	Frequency $v = c/\lambda$	Energy $E = qV$

6. Now plot a graph between voltage V and λ^{-1} and determine the slope of the line. It will give the value of hc/e. Now substitute the value of c ($3X10^{8}$ m/s) and e ($1.6X10^{-19}$ C) deduce the value of Planck's constant h.