1 Prelab

i) Defining the following:

The Fill Factor	The ratio of maximum obtainable power to the product of the open-circuit voltage and short-circuit current. ($\text{FF} = \frac{V_{max} \cdot I_{max}}{V_{oc} \cdot I_{sc}}$) This is geometrically defined by the largest rectangle which will fit inside of the illuminated I-V curve and is a measure of efficiency where the higher the fill factor, the better the solar cell.
V_{oc} and I_{sc}	V_{oc} is the open circuit voltage which is also known as the no load voltage ($I = 0$), this is an equilibrium point where the forward current compensates for the reverse photo-current. and I_{sc} is the short circuited ($V = 0$) current, where the current is solely due to the collection of the optically generated carriers.
Solar cell efficiency	The solar cell efficiency refers to the portion of energy in the form of sunlight that can be converted via photovoltaics into electricity.

ii) I-V characteristics curve of a typical solar cell:

The I-V curve of a typical solar cell with no illumination is described by that of the usual diode graph, therefore it is an exponential graph with Voltage as the x-axis. When the light is applied to the cell, the exponential shape of the graph does not change but a negative baseline current is generated. Hence the graph crosses the y-axis at I_{sc} due to the generated photoelectric current, and intersects the x-axis at V_{oc}.