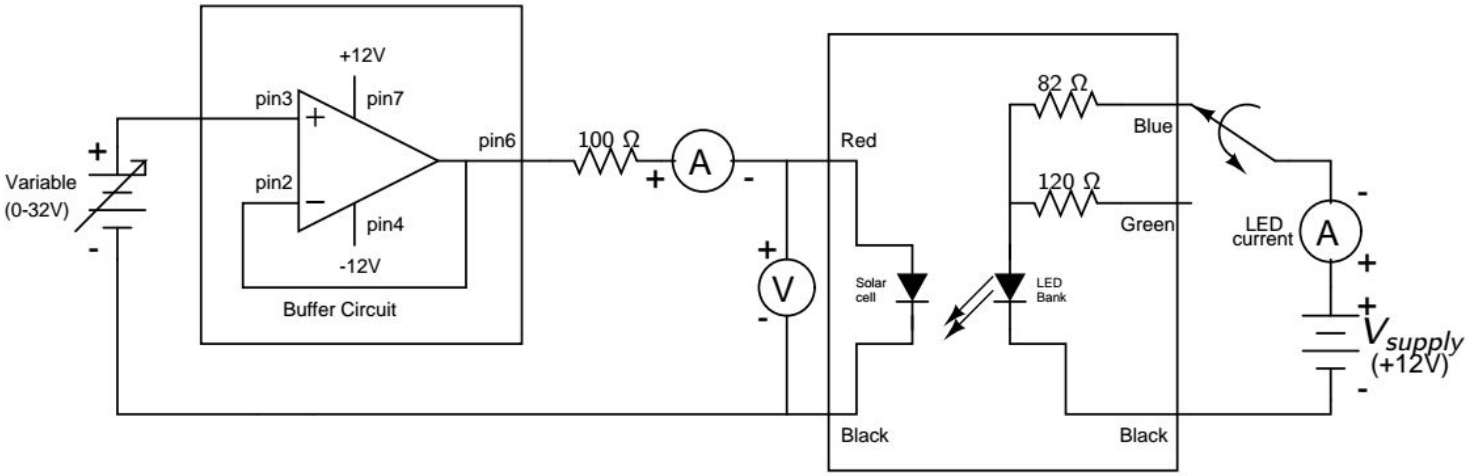
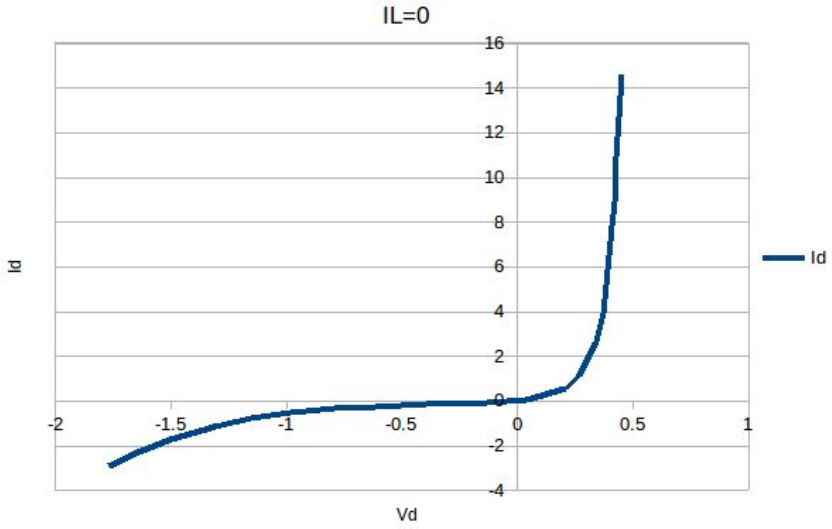
LAB 4

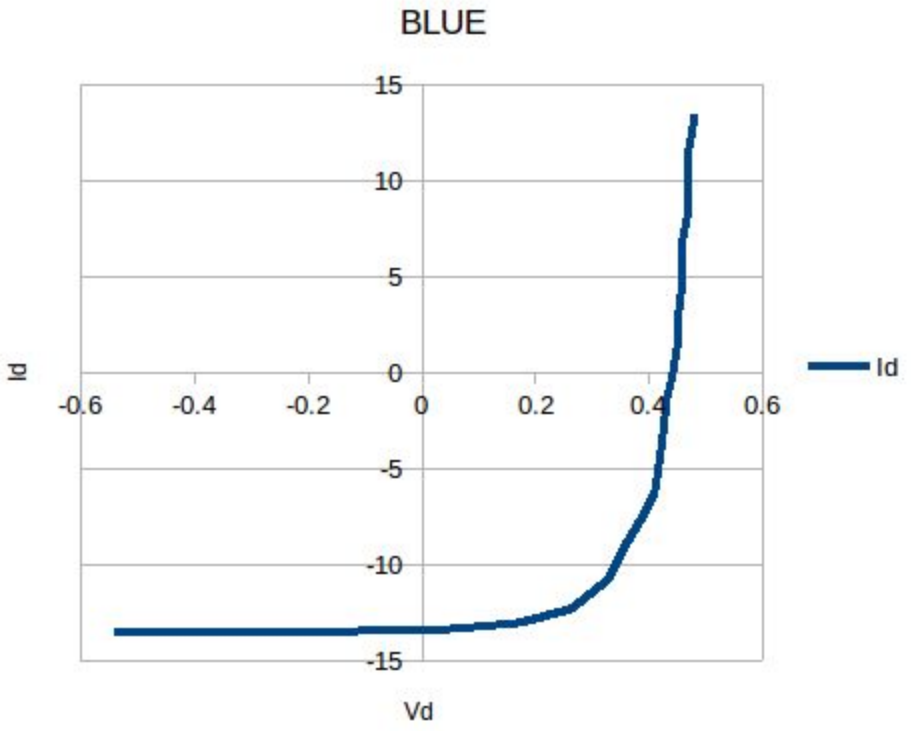
Name : SANYYAM KHANDELWAL **Roll No:16D070038**
Batch:Monday **Table No:17**
Exp Date:28/8/2017
Name of TA/RA :Jerin



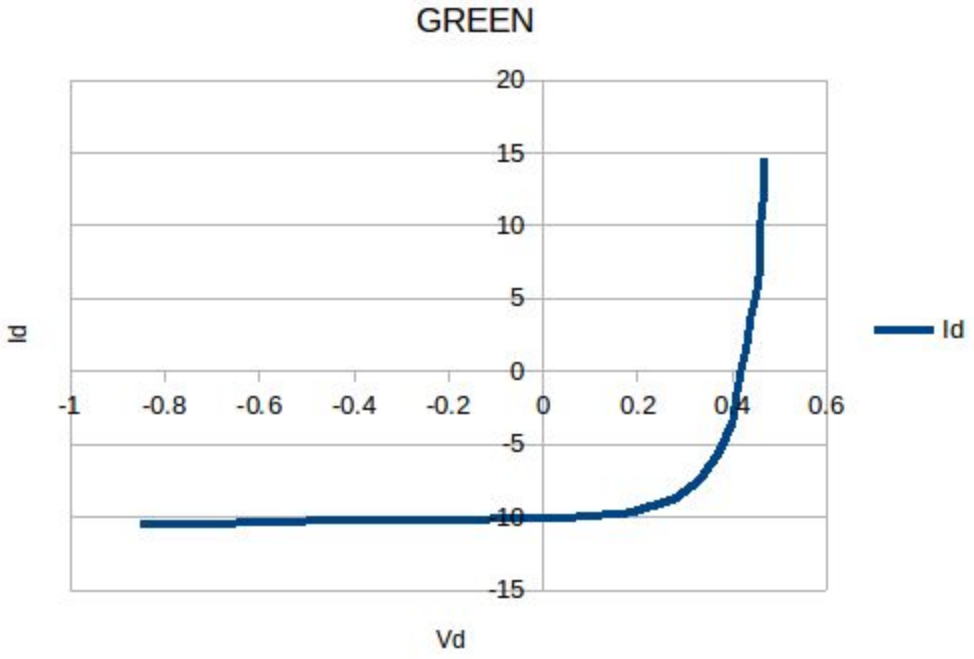
Part-1

1.Plot the I-V characteristic of the solar cell that you measured from Part 1 for dark, intensity I1 and Intensity I2.
ANS.

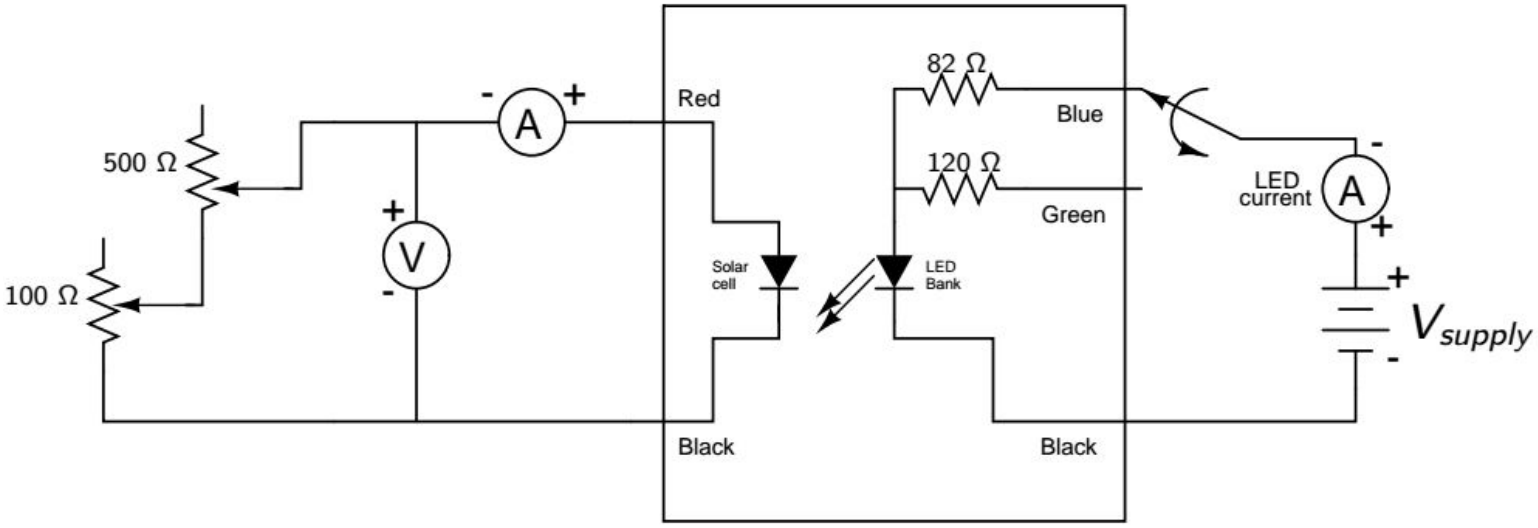




I_{Led}= 59 mA



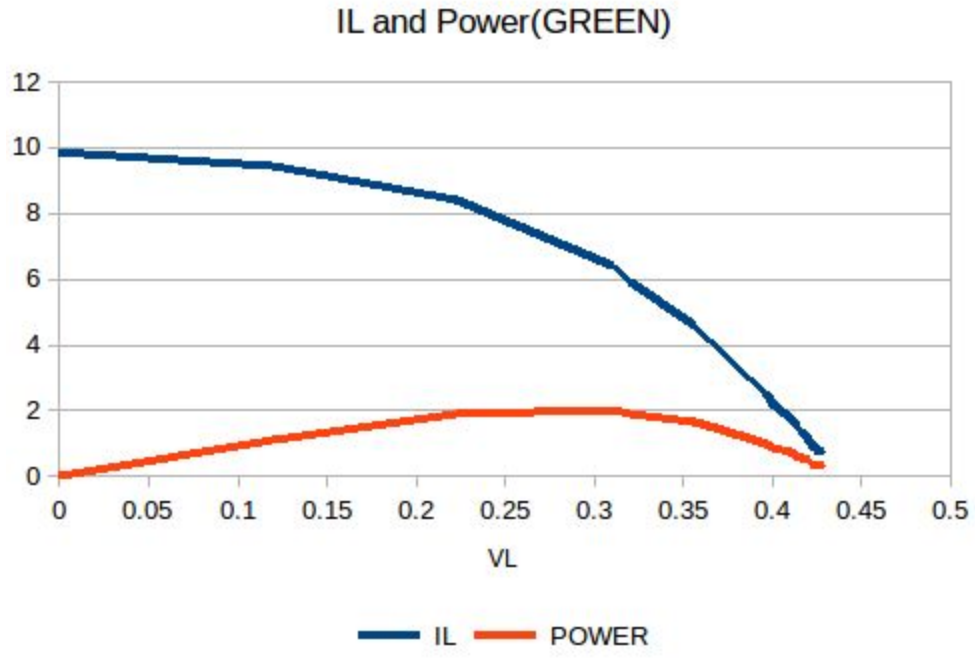
I_{Led}=44.1mA



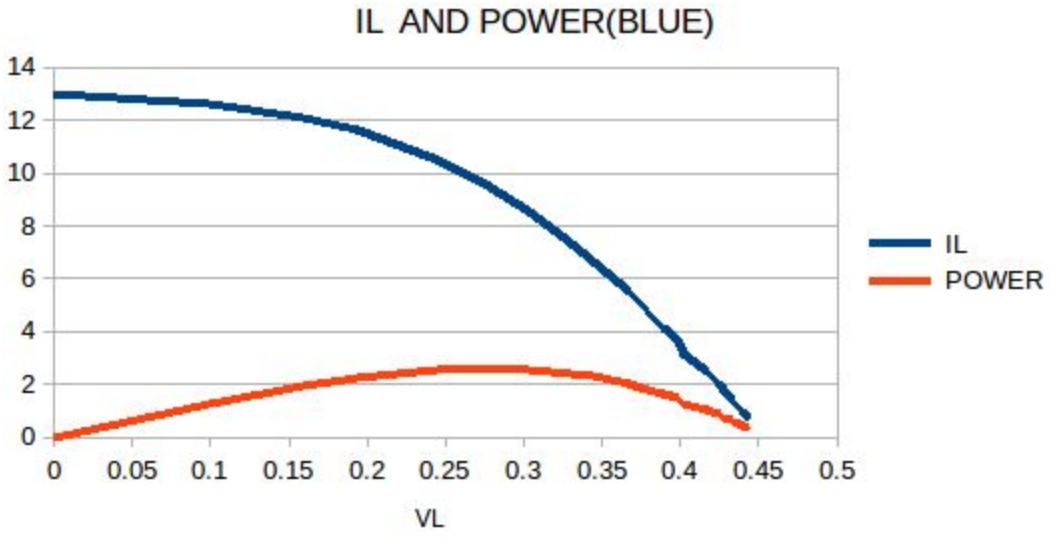
PART-2

2.From the data from Part 2, Plot I as a function of V. From this graph find Isc and Voc for two intensities I1 and I2.Also plot Power P as a function of V on the same plot.Find the current IMP at the maximum power point. Using IMP and VMP, calculate the fill factor

ANS.



I_{Led}=44.1mA



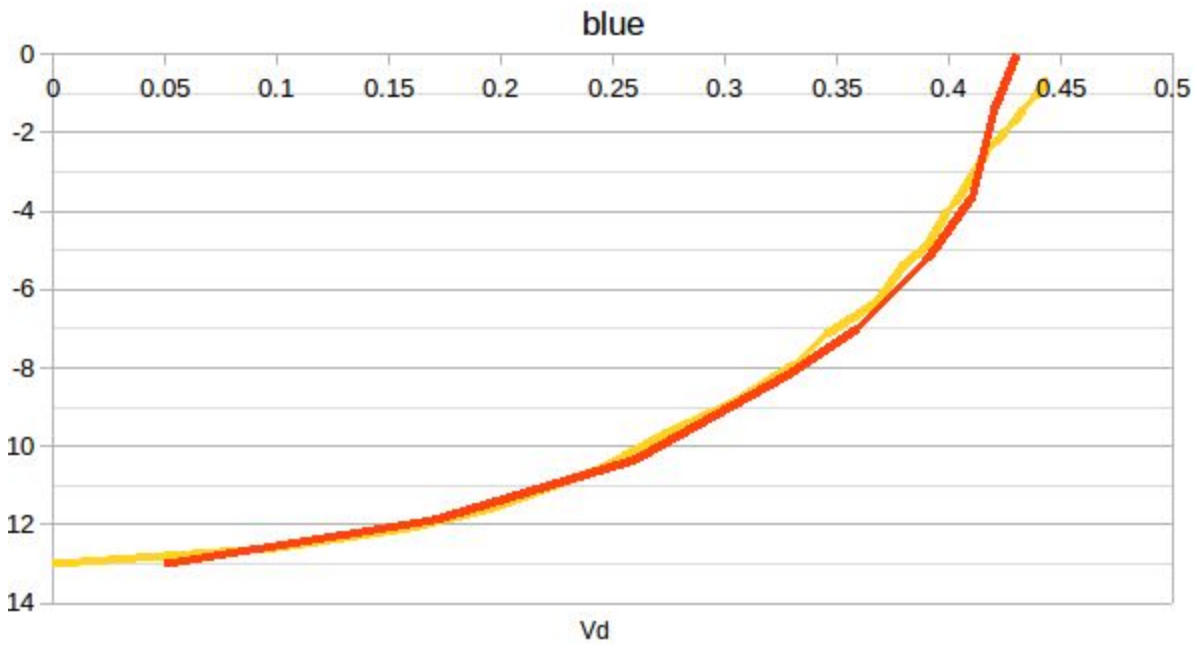
I_{Led}= 59 mA

$$FF = I_{MP} * V_{MP} / (I_{sc} * V_{oc}).$$

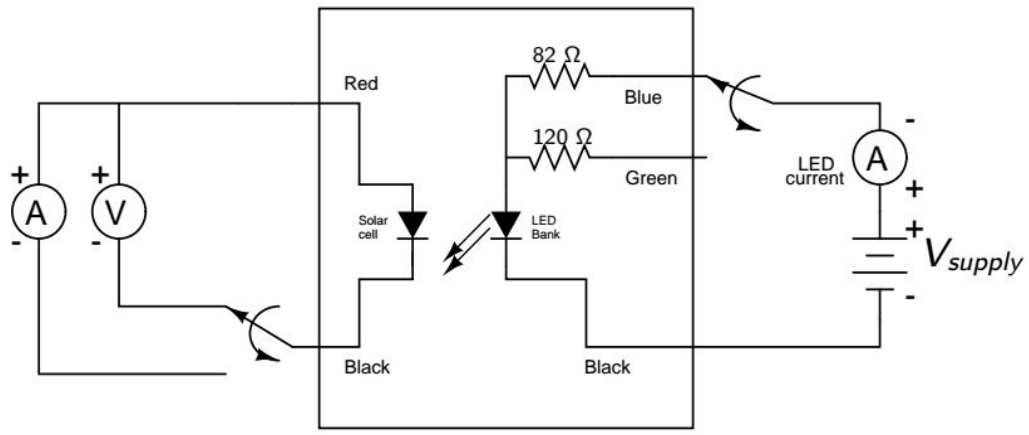
Intensity	V_{oc}	I_{sc}(mA)	V_{mp}	I_{mp}(mA)	FF
I1	0.429V	9.83	0.311V	6.41	0.472
I2	0.444V	13.01	0.273V	9.69	0.457

4.Superimpose the readings of Part 1 obtained in the fourth quadrant and readings obtained in Part 2. Do they match?

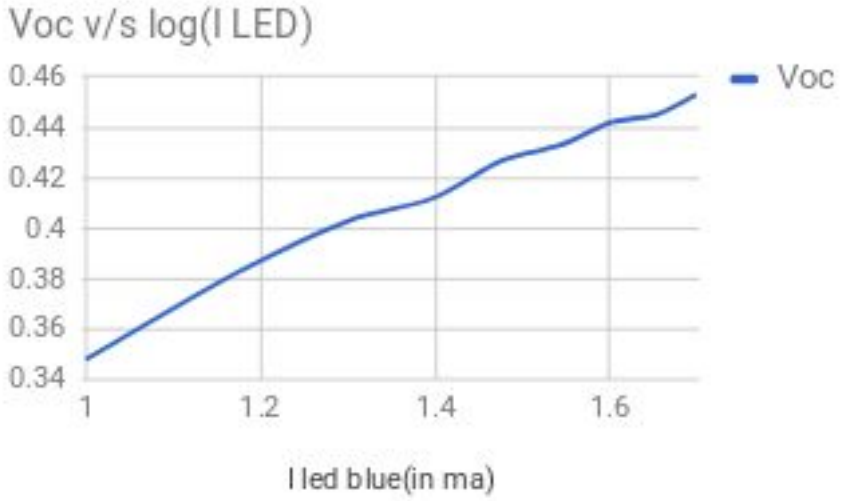
ANS.

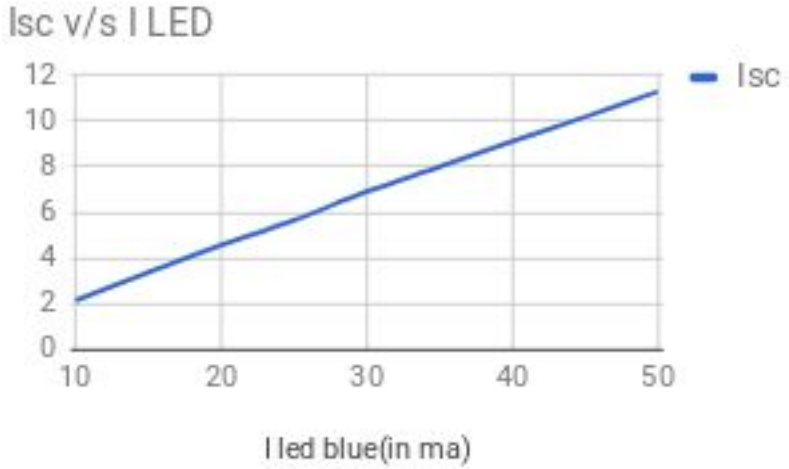

blue
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
-2
-4
-6
-8
10
12
14
Vd


GREEN
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
-2
-4
-6
-8
-10
-12
Vd
Id
Id


82 Ω
Red
Blue
120 Ω
Green
LED current
A
+
-
A
V
Solar cell
LED Bank
V_{supply}
Black
Black

5.Plot Isc v/s light intensity (LED current) and Voc v/s log intensity (LED current)





We notice I_{SC} increases linearly with $I_{LED.}$ Increasing I_{LED} increases the intensity of incident light which proportionately increases the light generated current in the Solar Cell.As a result,I_L increases linearly.

Since current I_D varies exponentially with V_D and since I_D and I_{LED} have been observed To be linear,the logarithmic variation is justified.