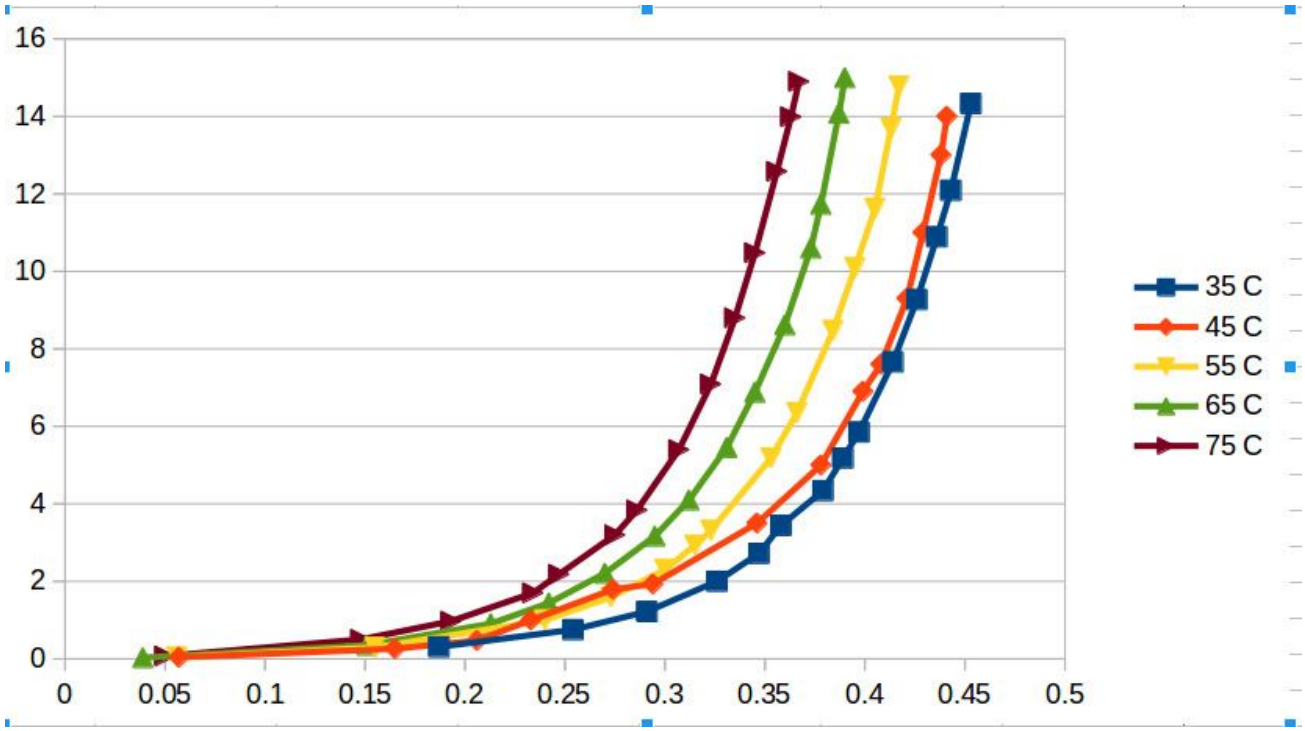
EE 236 Lab Report
Basic Electronic Devices

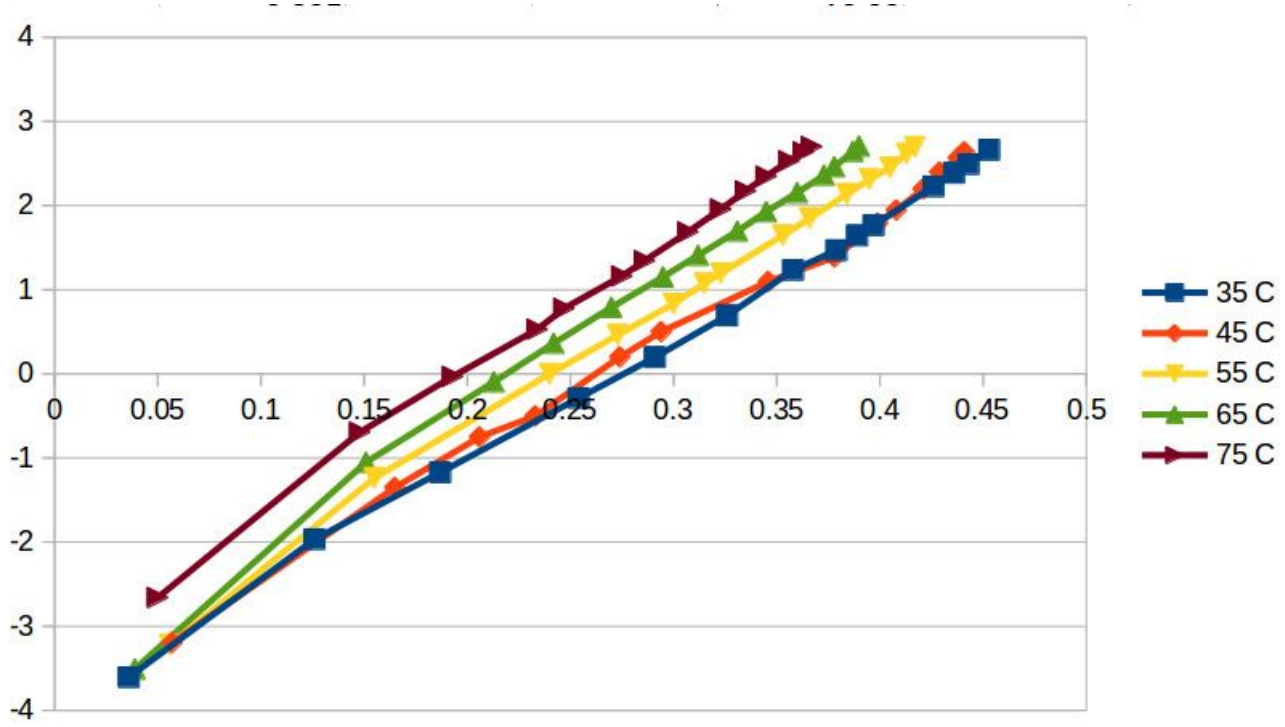
Experiment No. 5

Name : Devesh Kumar
Roll No: 16d070044
Batch:Monday
Table No: 20
Exp Date:
Name of TA/RA :Arindam Sarkar

Plot I_d -V_d and ln I_d / V_d characteristics at all temperatures.



Id vs Vd



ln Id vs Vd

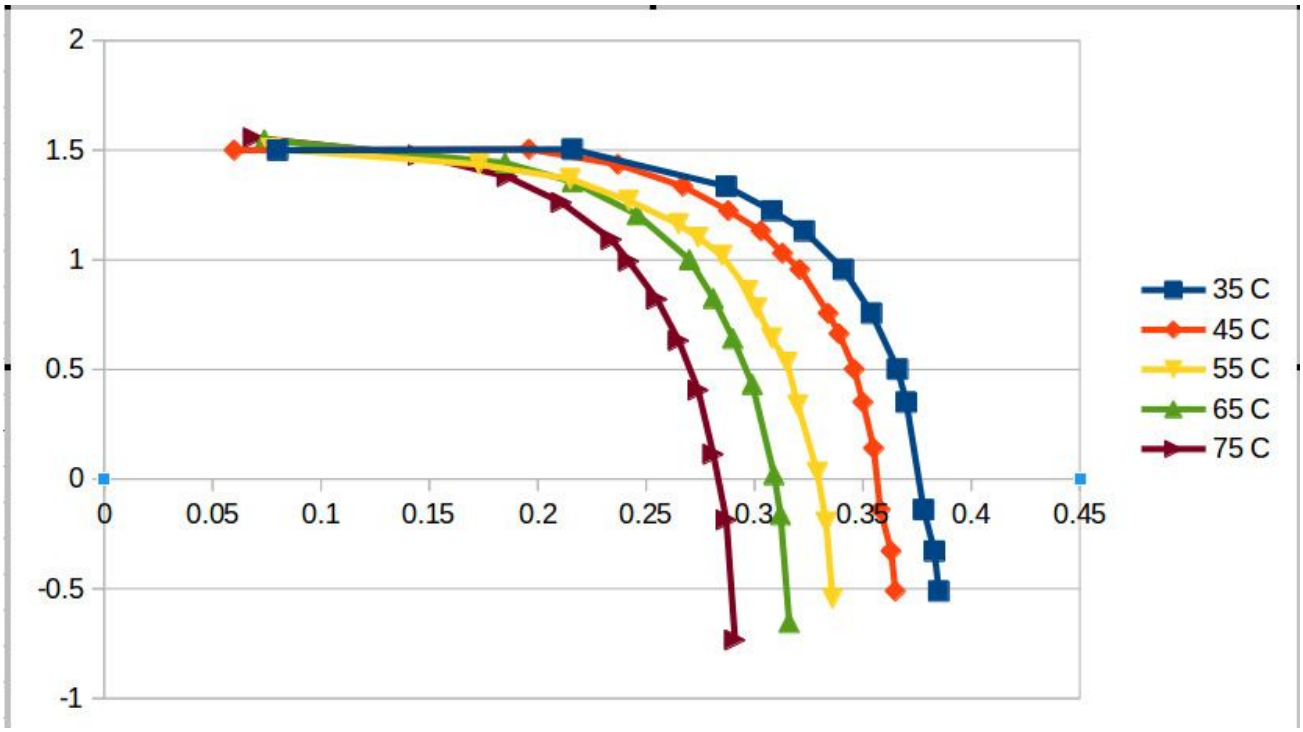
From I_d -V_d plots find voltage at 1 mA, 2 mA and 5 mA at each temperature. from ln I_d -V_d plots, obtain ideality factor at all temperature

Temperature	Vd for Id =1mA	Vd for Id =2mA	Vd for Id =5mA
35	0.3	0.37	0.41
45	0.27	0.34	0.395
55	0.24	0.3	0.36
65	0.22	0.26	0.33
75	0.2	0.24	0.3

Ideality factor does not seem to change for either current or voltage and is constant at 2.32 V

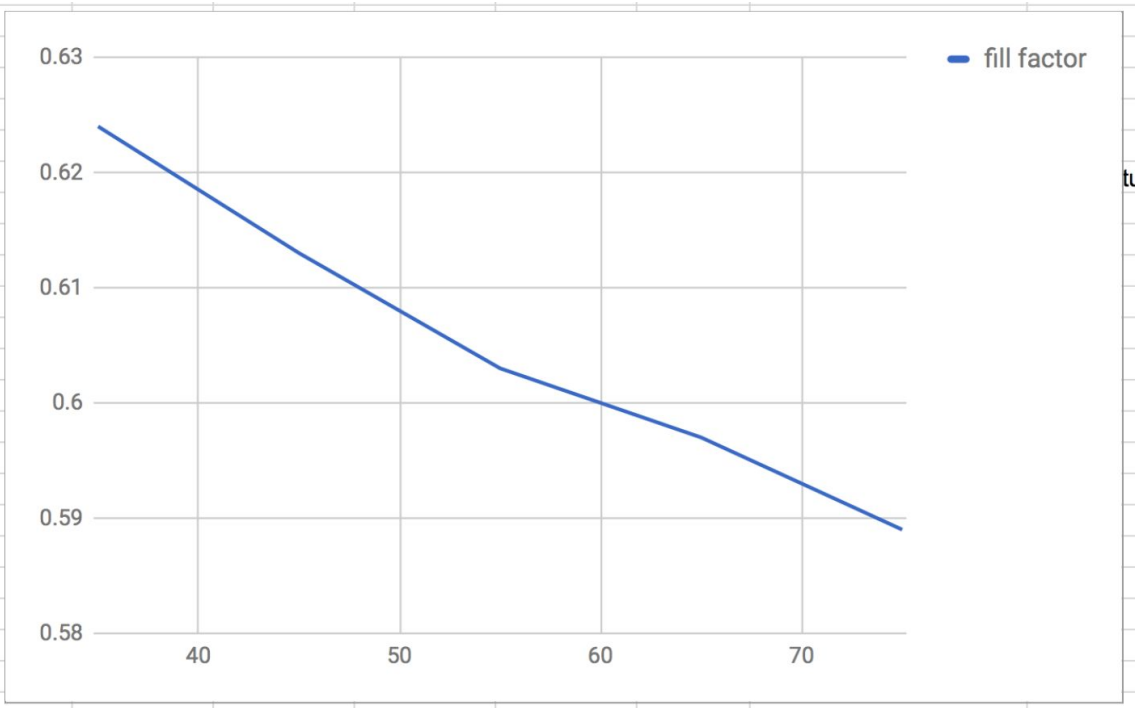
Part 2

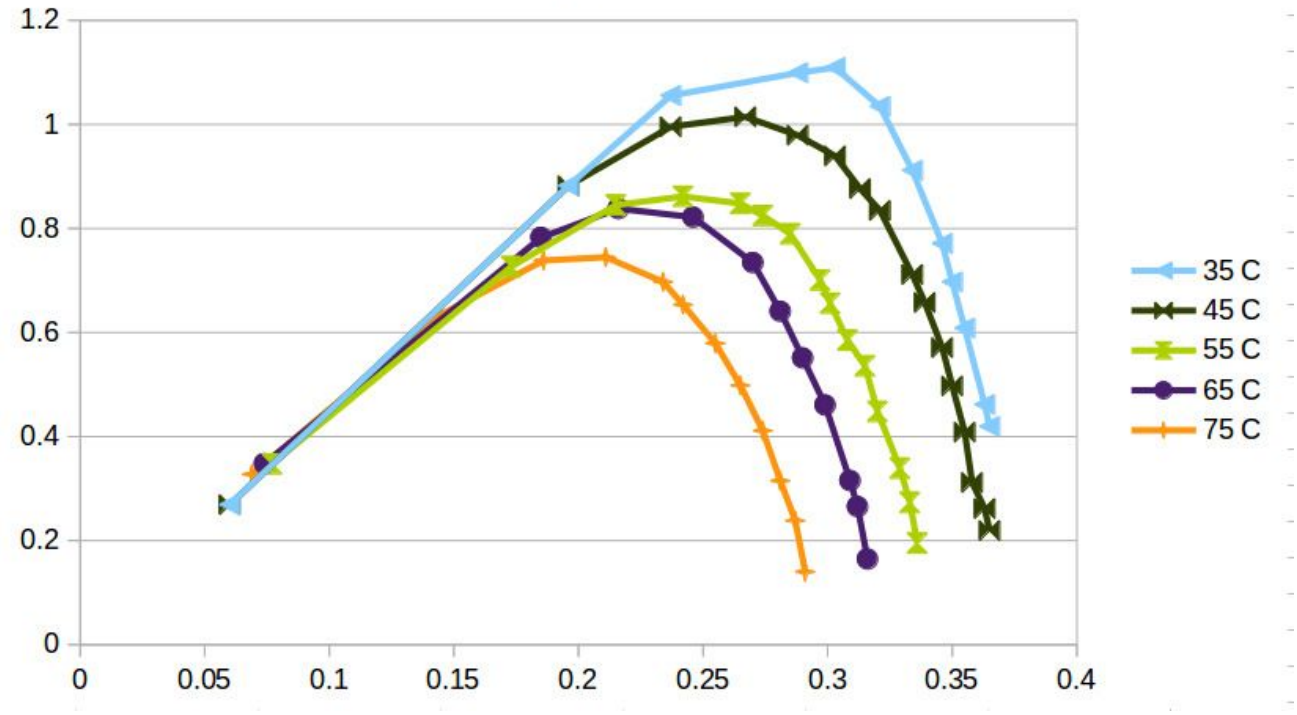
Plot I_L-V_L and P_L-V_L characteristics under lighted condition at all temperatures mentioned in slide 10.
Obtain fill factor(FF) for all temperatures and plot FF v/s temperature.



I_L-V_L

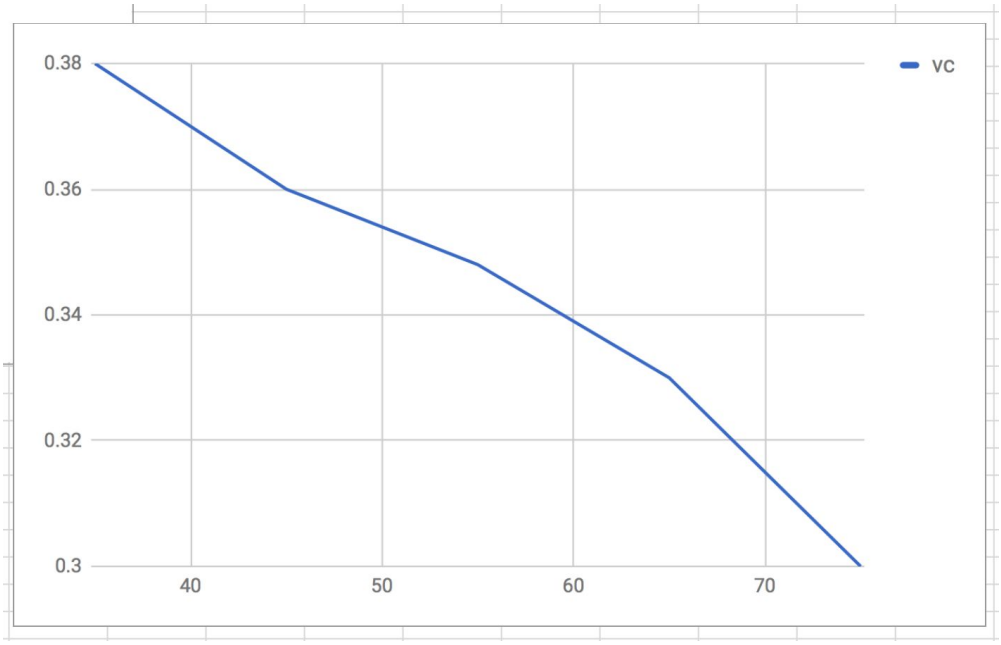
temperature	fill factor
35	0.624
45	0.613
55	0.603
65	0.597
75	0.589


fill factor
0.63
0.62
0.61
0.6
0.59
0.58
40
50
60
70

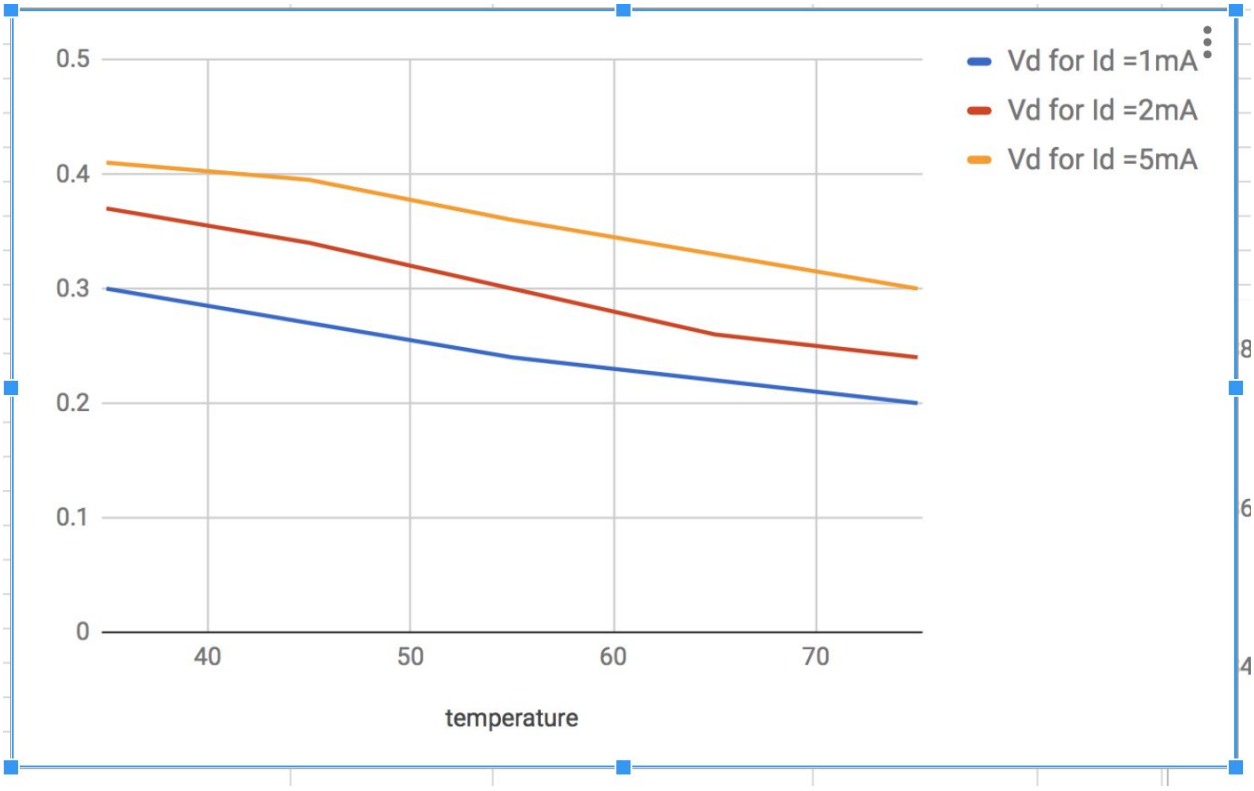

1.2
1
0.8
0.6
0.4
0.2
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
35 C
45 C
55 C
65 C
75 C

P_L-V_L

Plot V_d v/s T(temp) and V_{oc} v/s T(temp).



V_{oc} v/s T



Note: You will get three sets of V_d for I_d equal to 1mA, 2mA and 5mA each obtained in part - 1.

Comment upon the temperature dependence of : V_{oc}, I_{sc}, fill factor, and V_d.

Vd and **Voc** decrease linearly with increase in temperature.as temp increases bandgap decreases,as a result Vd decreases for a given Id.
Due to increase in temperature and decrease in bandgap semiconductor absorbs more photon ,thus **Isc** increases.
The product Isc vs Voc decreases but total power produced reduces further thus **fill factor** reduces substantially.