EE 212 (Electronic Devices Lab)

Experiment-1

Light Emitting Diode and Photodiode Characterizations

Group Info:

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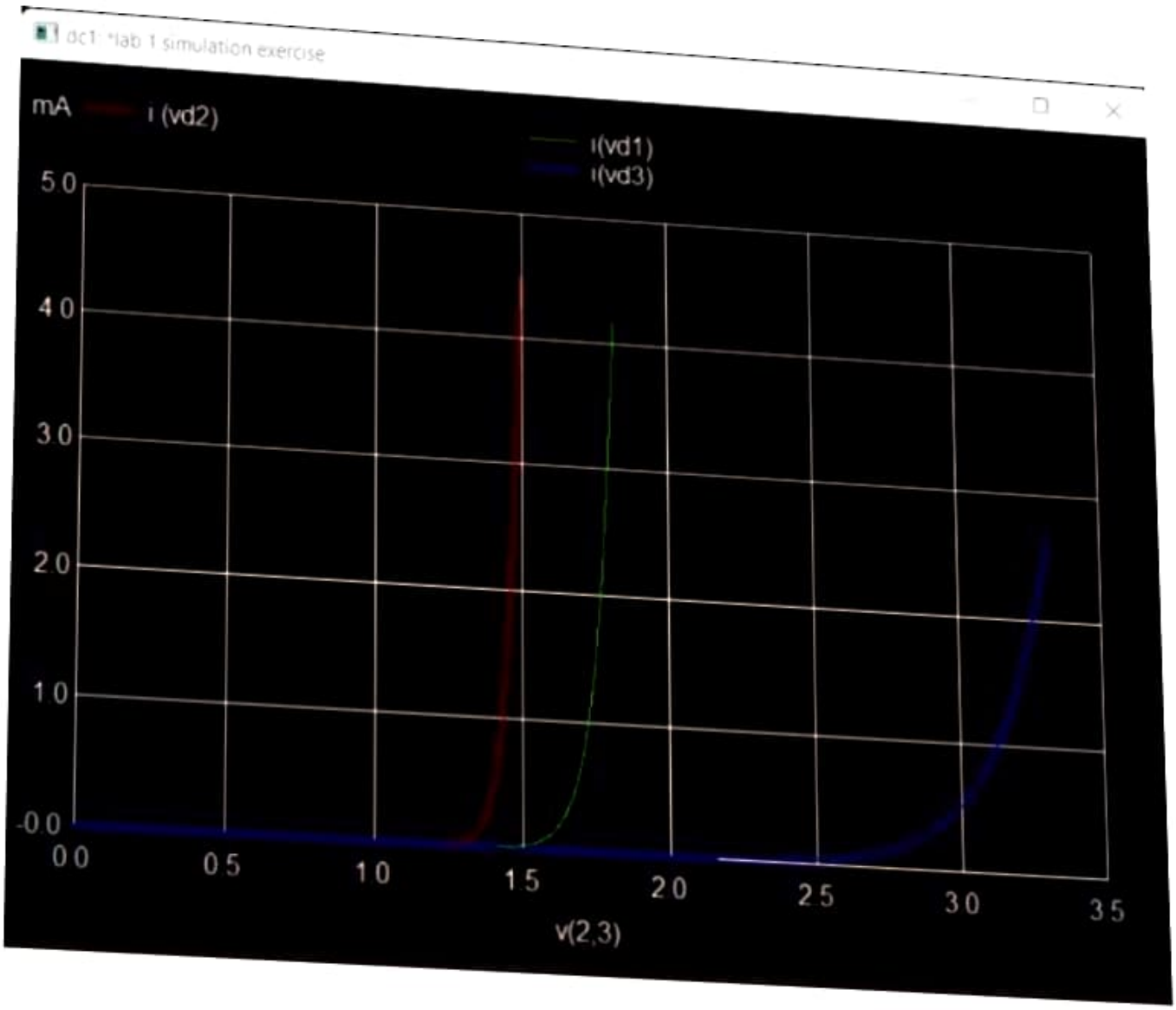
NGSPICE Code:

```
*lab 1 simulation exercise

.model red D(Vj=.75 Cjo=175p Rs=.25 Eg=3.2 M=.5516 Nbv=1.6989 N=2.4 Bv=1.7
Fc=.5 Ikf=0
Ibv=20.245m Is=880.5E-18 Xti=3)
.model green D(Is=1e-19 Rs=1.5 N=1.5 Cjo=50p Iave=30m Vpk=5)
.model blue D(IS=93.1P RS=42M N=7.47 BV=5 IBV=30U CJO=2.97P VJ=.75 M=.333
TT=4.32U)

r1 1 2 1000
r2 1 4 1000
r3 1 6 1000

d1 2 3 red
```

```
d2 4 5 green
d3 6 7 blue

vd1 3 0 0
vd2 5 0 0
vd3 7 0 0

Vin 1 0 dc 5v

.control

dc Vin 0 6 0.01

run

plot i(vd1) vs V(2,3), i (vd2) vs V(4,5), i(vd3) vs V(6,7)

* graph of ln(Id ) vs Vd
*plot ln i(vd1) vs V(2,3), ln i (vd2) vs V(4,5),ln i(vd3) vs V(6,7)

.endc
.end
```

Output:



Observation Table:

Observation Table

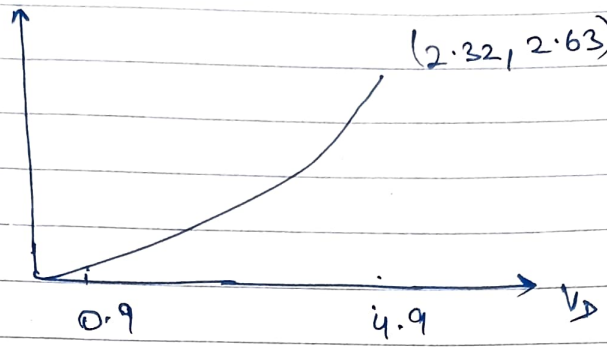
Notes

Main supply	Ammeter's readings (in mA)	Voltmeter's readings (in V)
Blue		
0.9	0	0.96
1.9	0	1.96
2.9	0.382	2.53
3.9	1.241	2.59
4.9	2.32	2.63
Green		
0.9	0	0.96
1.9	0.155	1.79
2.9	0.981	1.82
3.9	1.856	1.92
4.9	2.99	1.95
Red		
0.9	0	0.96
1.9	0.218	1.72
2.9	1.066	1.79
3.9	1.947	1.82
4.9	3.10	1.84

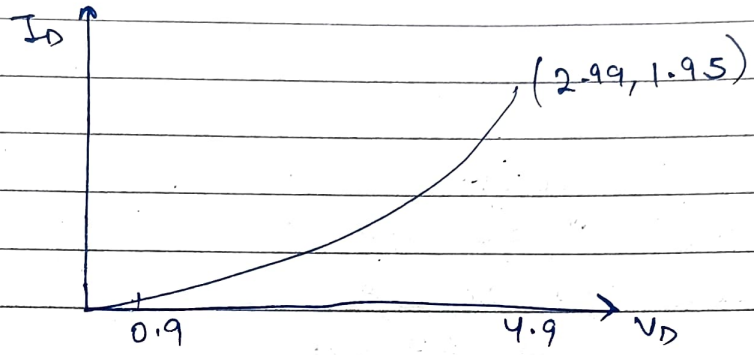
The hardware observations

Notes

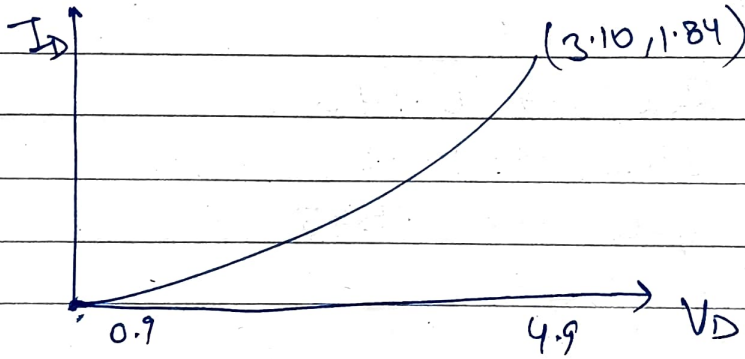
Blue



Green

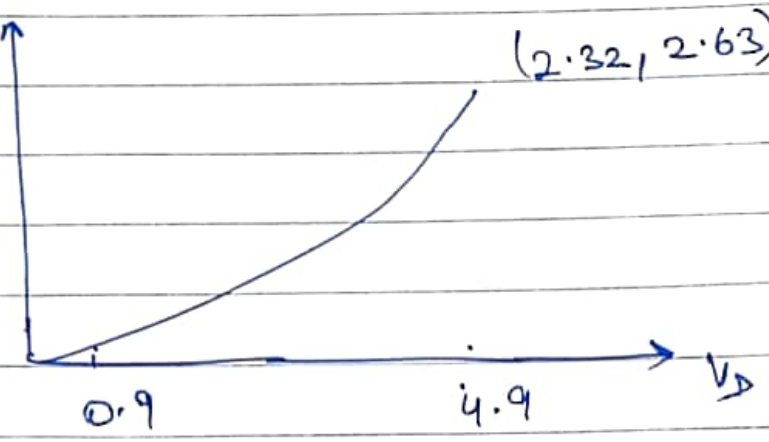


Red

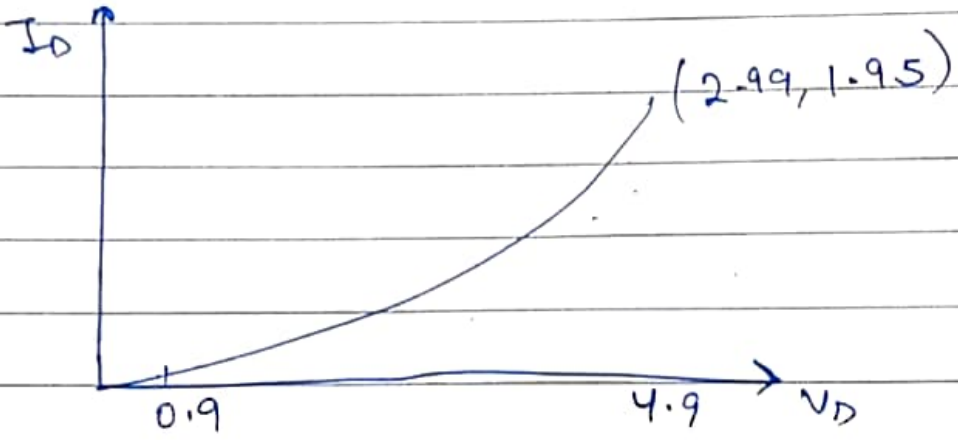


Teacher's Signature

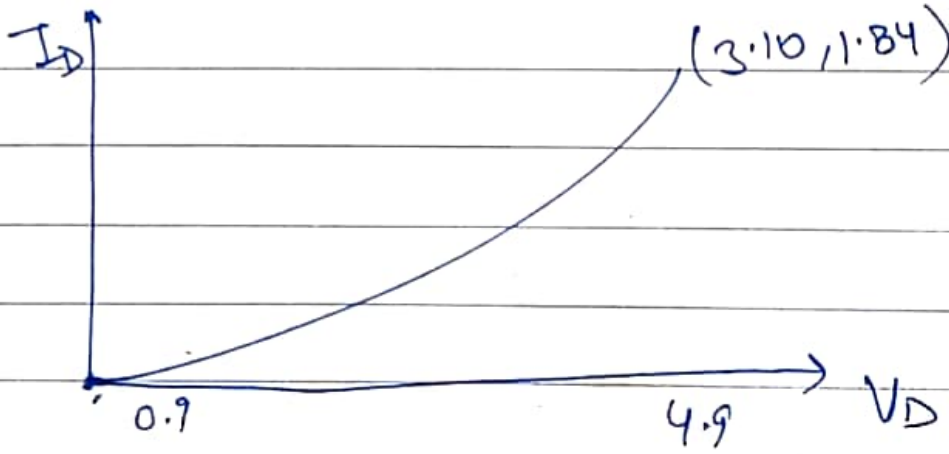
Blue



Green



Red



Discussion:

Manvi- It was a very learning experience in our first offline lab session. For the first time, we got to connect circuit components and record the outputs manually. We learnt about breadboard which gives us ease to connect the circuit components. The upper and lower sub parts of the breadboard have points which are connected horizontally, and the middle two sub parts have points which are connected vertically. Also, we ran the stimulation code on the terminal for the first time.

Shashi- we got to know about many things

*how to run ngspice netlist through terminal

*saw LED, resistors,bread board, and those Ammeter and voltmeter for first time .

*in breadboard vertical lines are in parallel and horizontal lines are in series.