Expirement 1

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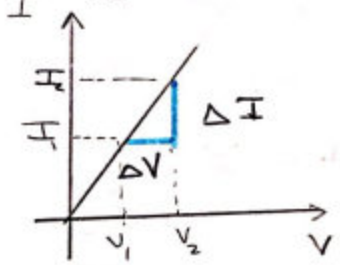
linear and non linear circuit components

- Components used :-
  - ↳ Carbon resistance, light bulb and a diode

Components are

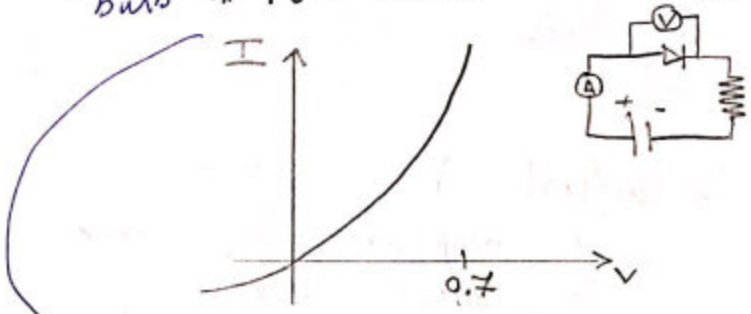
- **linear components** (Carbon resistance)
  - The slope of the line $= \frac{1}{R}$



- **non-linear components** (light-bulb, diode)

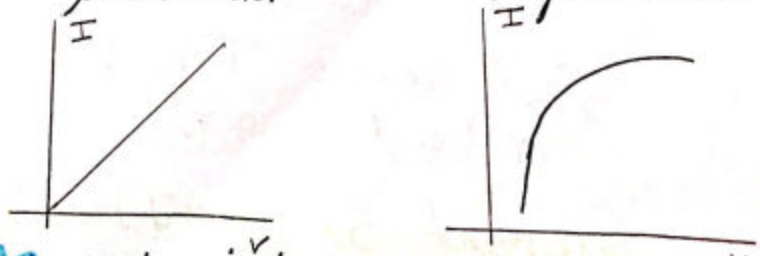
Diode: * $I = I_o (e^{V/K} - 1)$

For the light bulb * $R = R_o [1 + \alpha (T - T_o)]$



light bulb :- *

- low current- I
- high current I



Note

- A semiconducting consists of two pieces : a p-type piece and a n-type piece
  - → p-type with battery = forward baised
  - → n-type with battery = reverse baised

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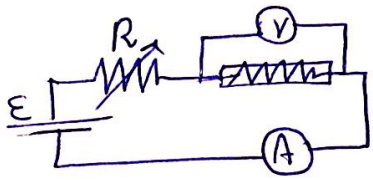
- What we used :-
  - A decade box Resistance (مقاومة متغيرة / صندوق المقاومات)
  - A voltage source
  - An element (Carbon Resistance, light bulb, Si diode)
  - Ammeter & voltmeter

- Procedure :-

1- element 1 (Carbon Resistance)

- Keep changing the value of R



to adjust V to (0.2, 0.4, ——)
and measure I Then draw I vs V.

2- element 2 (Si diode)

- Same as Resistance (Carbon)

And draw I vs V
(V (0.4 —— 0.7))

3- element 3 (light bulb)

- same but this time we need to measure high and low currents so Voltage Range will be (0.01 —— 3) Volts

١- العنصر الأول (المقاومة الكربونية)

هم تغيير قيم المقاومة المتغيرة
حتى تصبح V تساوي
(0.2, 0.4 —— 2)V
وقم بقياس I عند كل قيمة لـ V
ثم قم برسم I vs V

٢- العنصر الثاني (الثنائي)

نفس الخطوات التي قمت بها مع المقاومة الكربونية
ثم ارسم I vs V

٣- العنصر الثالث (المصباح)

نفس الخطوات السابقة لكن نحتاج إلى قياس تيار عالي و منخفض لذلك سيكون مدى الجهد (0.01 —— 3) Volts

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