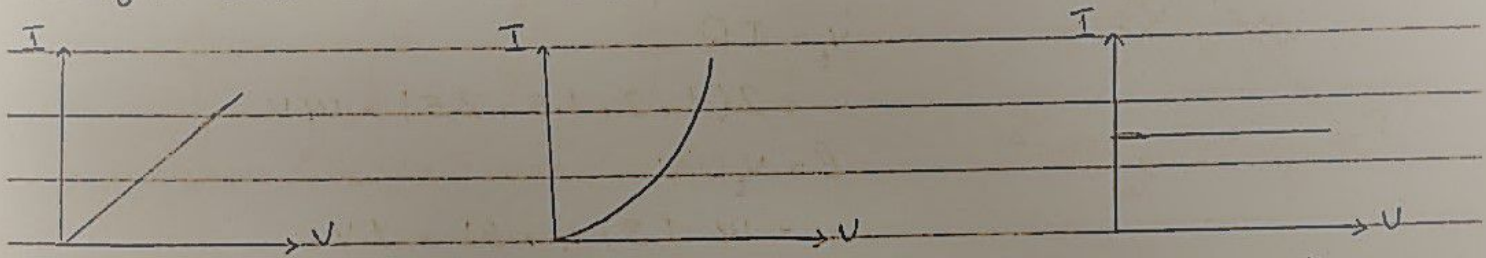
"lecture 1"

⇒ Circuit Components:-

→ Super Conductors → 0 = Registance



"linear Componen" "non linear componen" "D.C"

Ohm → V = IR

"$I \propto \frac{1}{R}$"

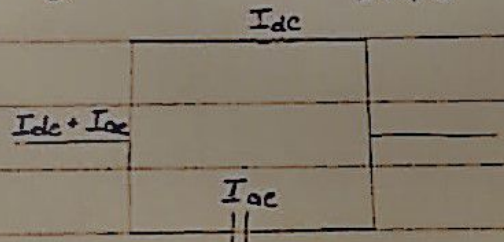
⇒ Capacitor:-

→ Why metals are good Conduction?

Because they are rich with free electrons.

1) Energy storage system → $X_C = \frac{1}{2\pi f C}$.

2) By PASS →



→ Charging → accumulation of change caniers.

• $V = V_0 e^{\frac{-t}{Rc}}$.

↳ C = Capacty / R = Registanee / Rc = Time Constant / V_0 = "V" at "t=0".

→ Rc = t.

∴ $V = V_0 e^{\frac{-t}{t}} = \frac{V_0}{e}$.

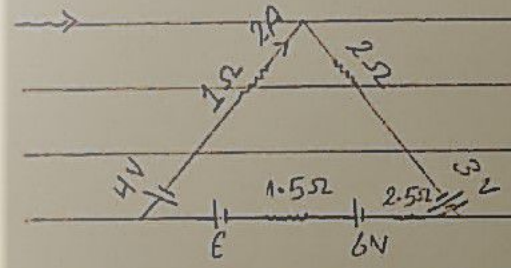
⇒ D.C circuit Theories:-

1) Kirchhoff's laws:-

a) At any junction in an electric circuit the total current flowing toward that junction must equals to the total current flowing away from that junction.

"$\Sigma I = 0$" → "Current law"

$\rightarrow I_1 + I_2 - I_3 - I_4 - I_5 = 0$



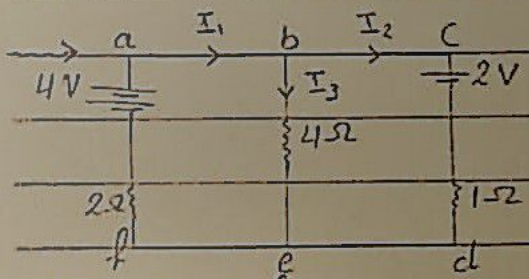
$V_t = IR$

$= 2(1+2+1.5+2.5) = 14\,V$

$E = V_t - V$

$= 14 - (3+4+6) = 1\,V.$

b) In any closed loop in a network the algebraic sum of the voltage drops taken around the loop is equal to the resultant emf acting in that loop. "$\Sigma NB = \Sigma IR$" → "Voltage law"



1) loop, abcfa :

$4 = 4I_3 + 2I_1 \rightarrow (1)$

2) loop bcdeb :

$2 = I_2 - 4I_3 \rightarrow (2)$

3) By using current law :

$\Sigma I = 0$

$\therefore I_1 - I_2 - I_3 = 0 \rightarrow (3)$

$I_1 = I_2 + I_3$

$4 = 4I_3 + 2(I_2 + I_3) \rightarrow 4 = 6I_3 + 2I_2$

$2 = I_2 - 4I_3 \quad (\times 2)$

$4 = 2I_2 + 6I_3$

$-4I_3 = 0 \rightarrow I_3 = 0$

$I_2 = 2\,A \;\&\; I_1 = 0 + 2 = 2\,A.$