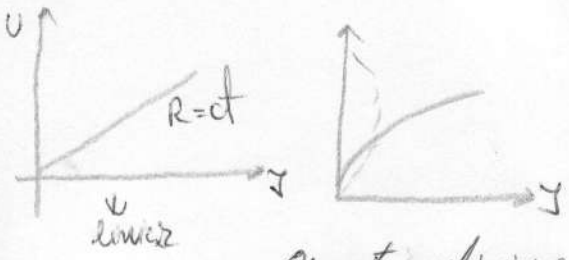
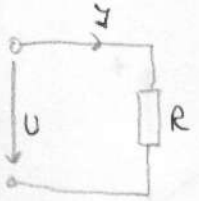
1. Circuite neliniare de curent continuu

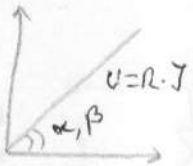


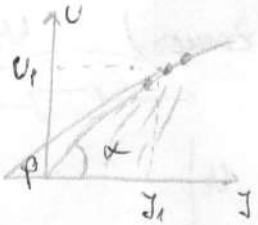
Curs 6

Circuite neliniare de curent continuu



$\frac{U}{I} = R = ct.$





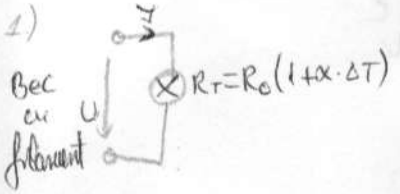
$R_1 = \frac{U_1}{I_1} = tg\,\alpha$

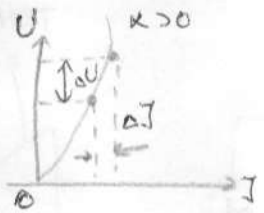
$\frac{U}{I} = R_{st} = tg\,\alpha$

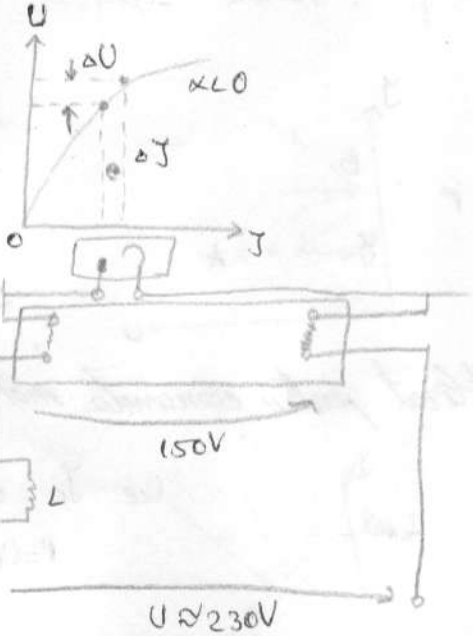
$\frac{\Delta U}{\Delta I} = R_d = tg\,\beta$

A) Exemple de circuite neliniare

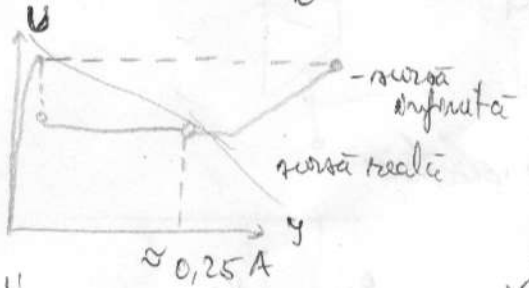
1) Bec cu filament



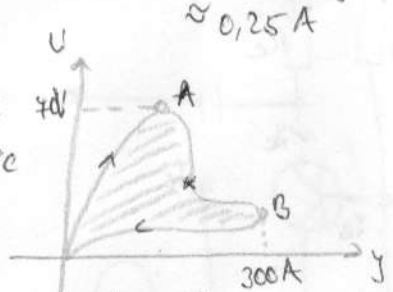




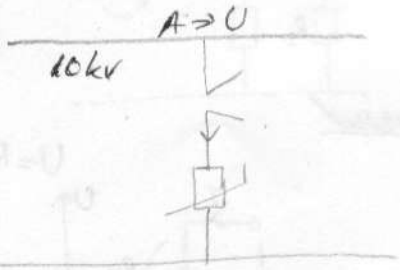
2) Bec cu neon



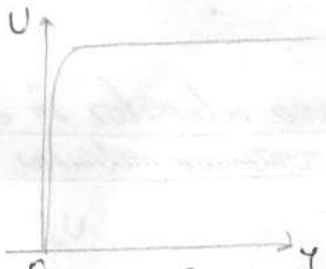
3) Arc electric



4.) Descărcătoarele - se utilizează în electrică pt. a prelua supratensiunea

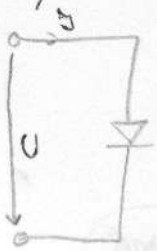


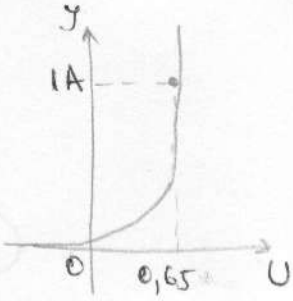
$E = \frac{10kV}{1\,cm}$

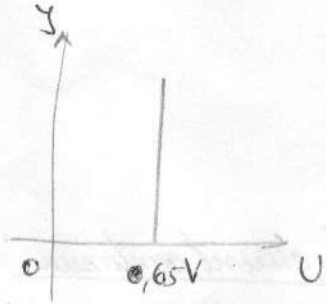


↳ funcționează și în curent continuu

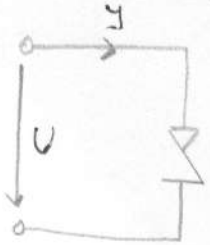
5.) Diode: care au la bază siliciu:

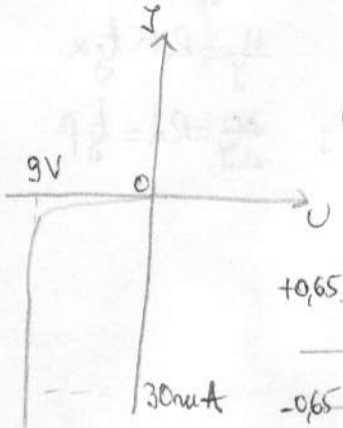


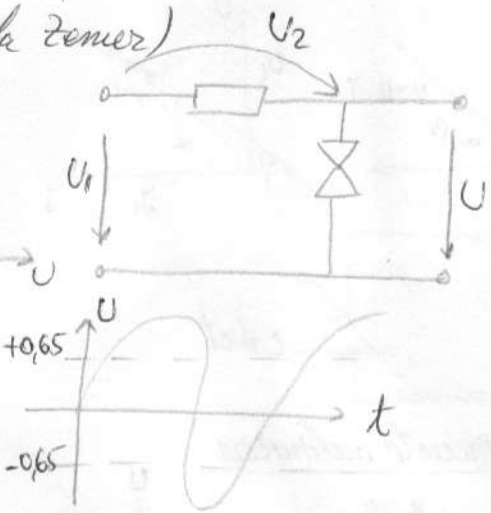


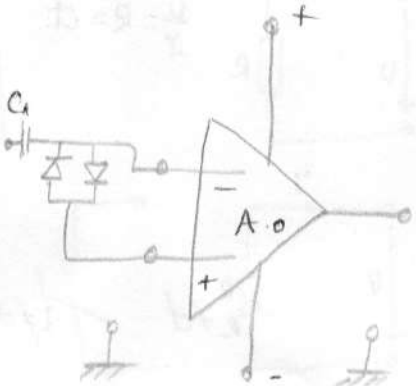


6.) Stabilizatoare de tensiune (dioda Zener)

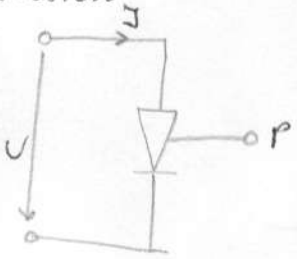


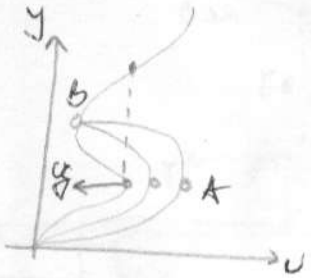


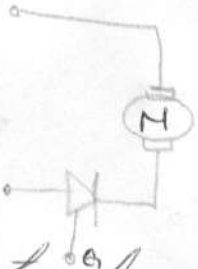




7.) Tiristor

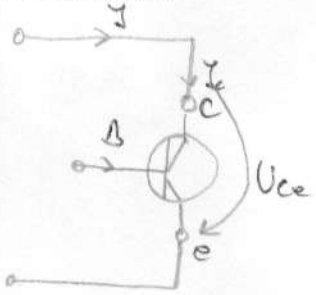


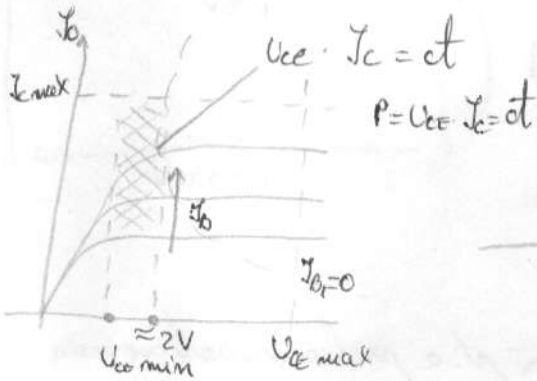


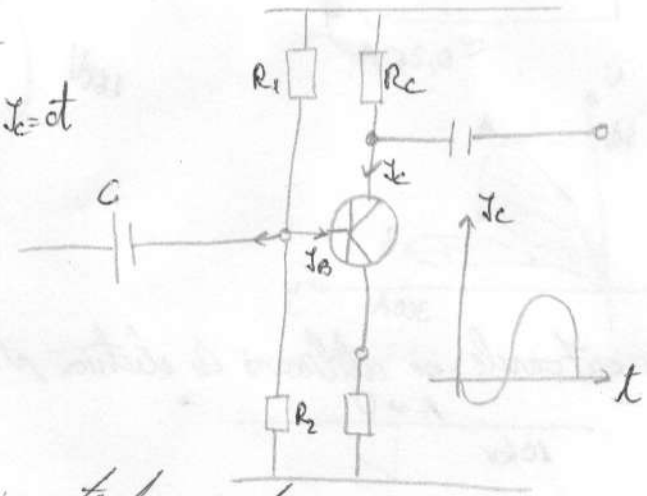


Tiristorul este utilizat pentru comanda motoarelor electrice

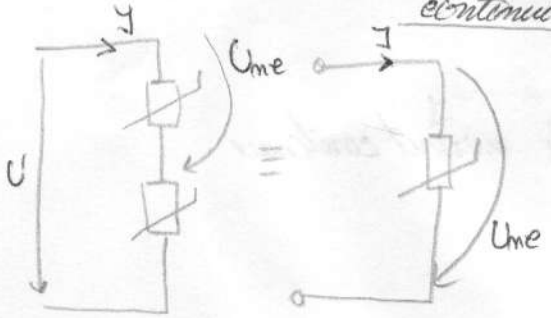
8.) Tranzistor

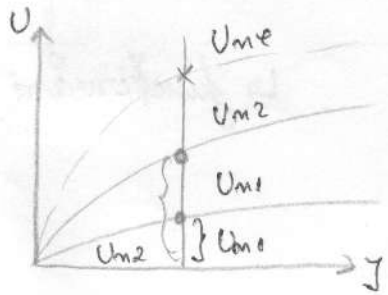


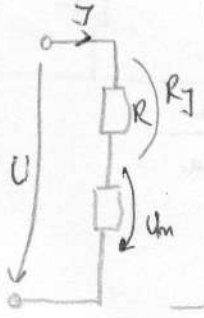


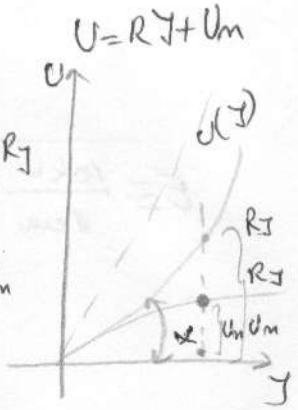


6. Simplificarea schemelor în circuite de curent continuu neliniare

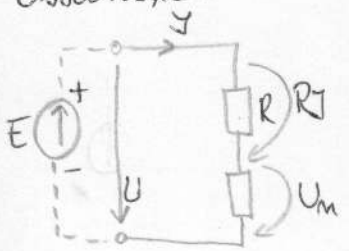


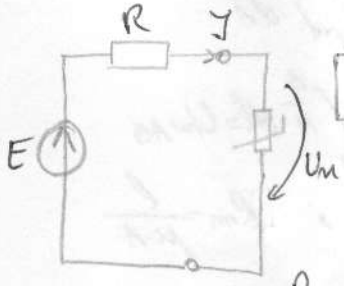






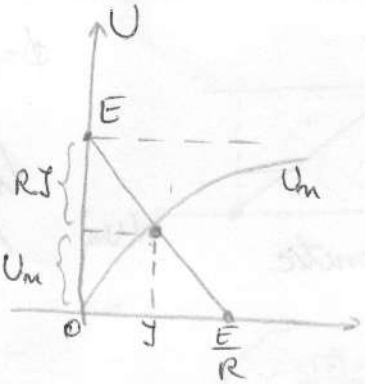
Observație:

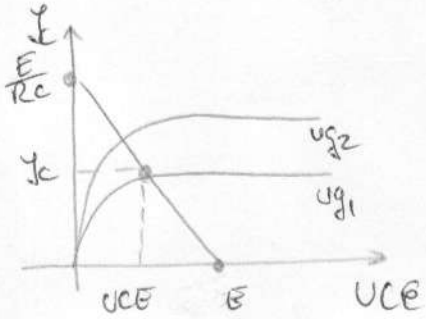


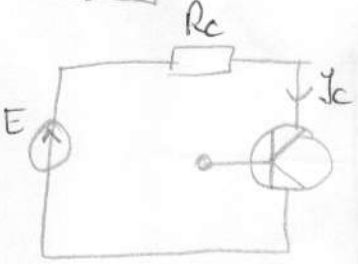


$$E = R \cdot I + U_m$$

$$\boxed{U_m = E - RI}$$

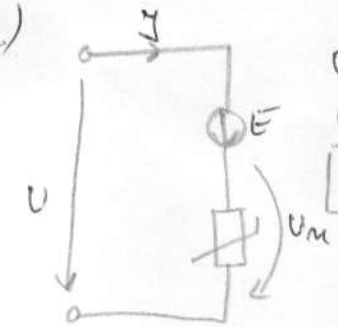






Elemente neliniare în serie cu un element

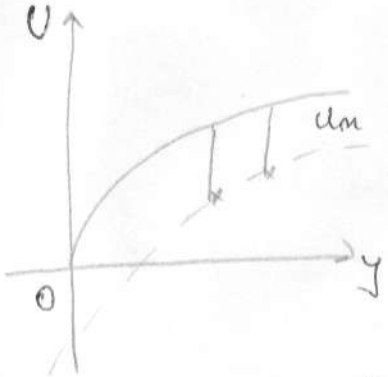
a)



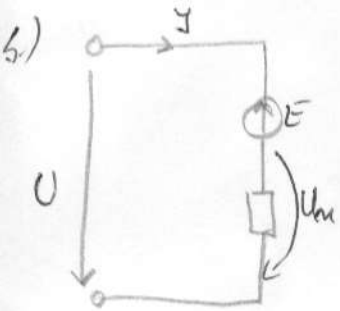
$$U + E = R \cdot I$$

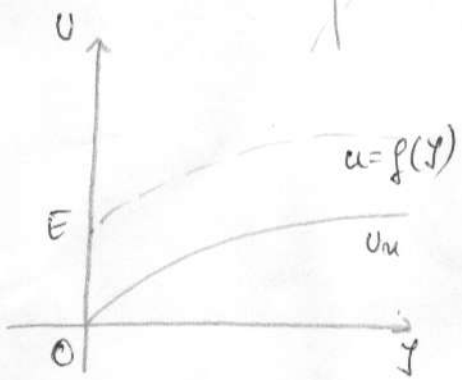
$$U + E = U_m$$

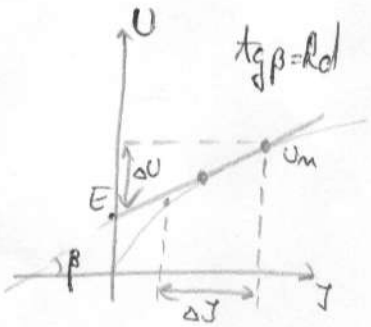
$$\boxed{U = U_m - E}$$

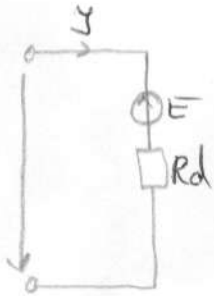


b)

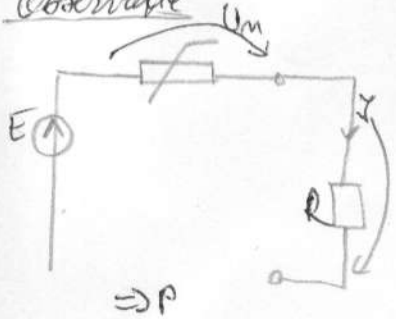








Observație



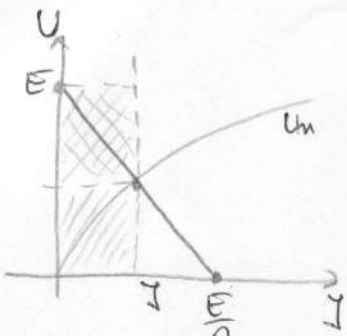
$$E = R \cdot I + U_m$$

$$RI = E - U_m$$

$$RI^2 = I(E - U_m)$$

$$\boxed{P_2 = R \cdot I^2 = I(E - U_m)}$$

$\Rightarrow P$



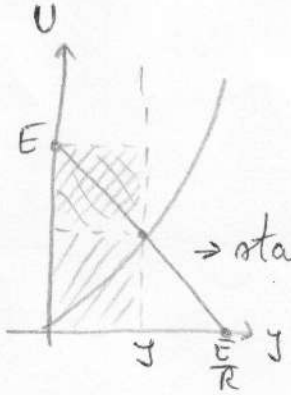
→ stabilizator de tensiune

$$\frac{\partial P_2}{\partial I} = 0$$

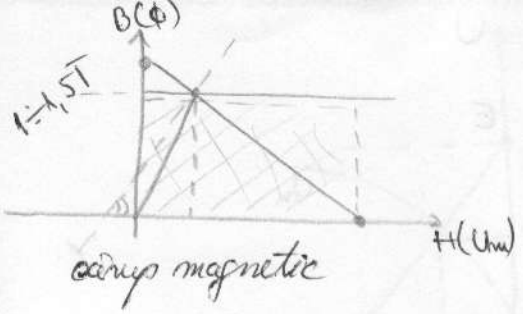
$$E - U_m - \frac{\partial U_m}{\partial I} \cdot I = 0$$

$$RI = I \cdot \frac{\partial U_m}{\partial I} \Rightarrow \boxed{R = R_d}$$

Condiția transferului maxim de putere



→ stabilizator de curent



câmp magnetic

$$\Phi = \int_{S\Gamma} \bar{B} \cdot d\bar{A} \Rightarrow \lambda = \int_{S\Gamma} \bar{J} \cdot d\bar{A}$$

$$\int_A^B \bar{E} \cdot d\bar{l} = U_{AB} \Rightarrow \int_A^B \bar{H} \cdot d\bar{l} = U_{mAB}$$

$$R = \rho \cdot \frac{l}{A} = \frac{e}{\Gamma \cdot A} \quad ; \quad R_m = \frac{l}{\mu \cdot A}$$