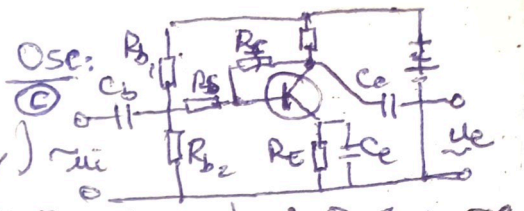
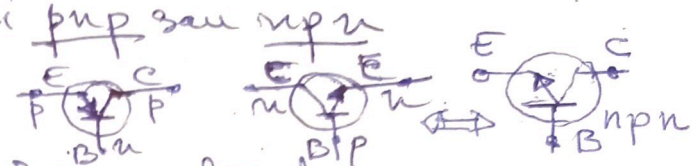
Tranzistorul bipolar cu joncțiuni (pn)

Osc: 

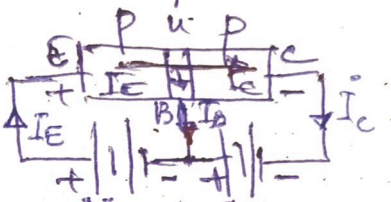
- 1947 – Bell Telephone Laboratory (New Jersey) (J. Bardeen + W. H. Brattain + W. B. Shockley) PN-1956
  - dezvoltarea electronicii
- Tipuri { bipolare – cu joncțiuni pnp sau npn
  unipolare (TEC + FET)

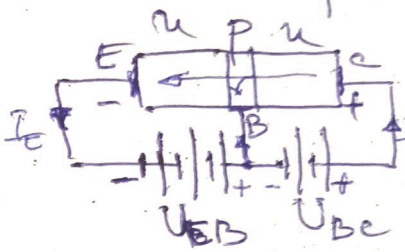


- Def.: – cristal semicond. cu care s-au realizat prin dopare 3 zone de conductie care alternează (Emitor, Bază, Colect) care joacă rol de electrozi prin care circulă curenții (I_E, I_C, I_B) la aplicarea tensiunilor de polarizare
- Ec. trouz (directă – inversă)

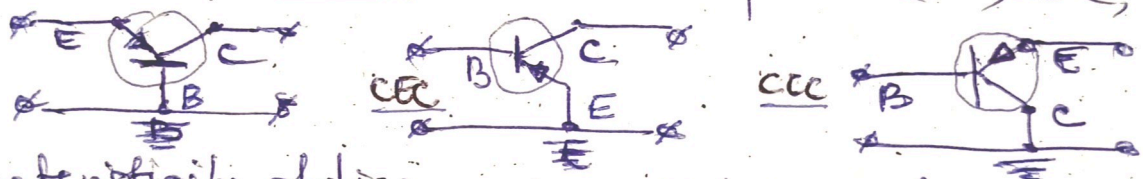
α (0,9 – 0,99)
β (20 – 500)

$\dot I_E = \dot I_C + \dot I_B$
$\dot I_C = \alpha \cdot \dot I_E + \dot I_{E=0} = \left(\dot I_C = \frac{\dot I_C}{\alpha}\right)$
$\dot I_B = (1-\alpha)\, \dot I_E$
$\dot I_C = \frac{\alpha}{1-\alpha}\, \dot I_B = \beta \cdot \dot I_B$



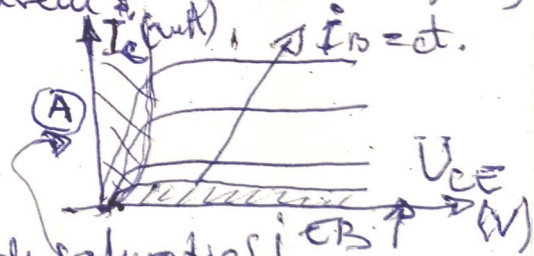


- Modul de conexiune: a trouz. bipolar (BC, CEC, CCC)

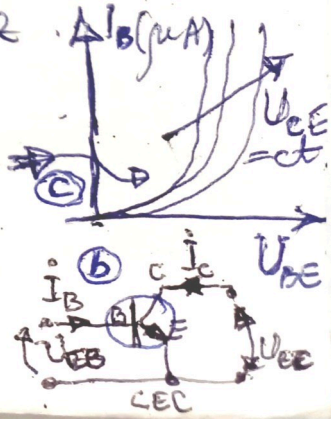


- Caracteristicile statice. – dependențele dintre curenți–tensiuni
- Regimul de funcționare care caracterizează un anumit regim de funcț. funcție de tensiunile de polarizare avem:

Reg. funcț. { a) regimul normal { – jEB – pol. direct ↗ / – jBC – pol. invers ↘
b) reg. invers { jEB – pol. invers ↘ / jBC – pol. direc. ↗
c) – regimul de blocare { jEB ↘ / jBC ↘
d) – reg. de saturație ↗ { jEB ↗ / jBC ↘



Caract. funcț. { A – Caracteristica de ieșire (CEC) – $\dot I_C(U_{CE}) / \dot I_B = ct$
B – Caracteristica de transfer. $\dot I_C(\dot I_B) / U_{CE} = ct$
C) – Caracteristica de intrare. $\dot I_B(U_{BE}) / U_{CE} = ct$



- Rolul/funcțiile tranzistorului
  a) – comutator (Switch) { on / off
  b) – amplificator
  c) – oscilator