Q1

The operating principle for transistors is:

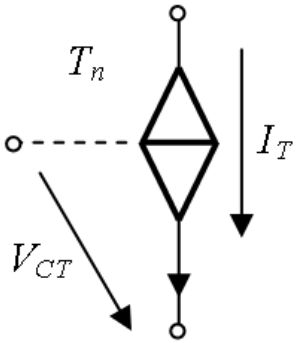
a) The voltage applied between two terminals controls the voltage between the remaining two terminals

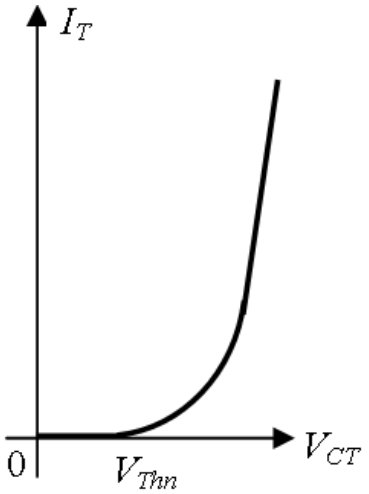
b) The voltage applied between two terminals controls the current through the third terminal

c) The current through one terminal controls the current through the remaining two terminals

d) The current through one terminal controls the voltage between the remaining two terminals

Q2





Based on the plot, the following is true:

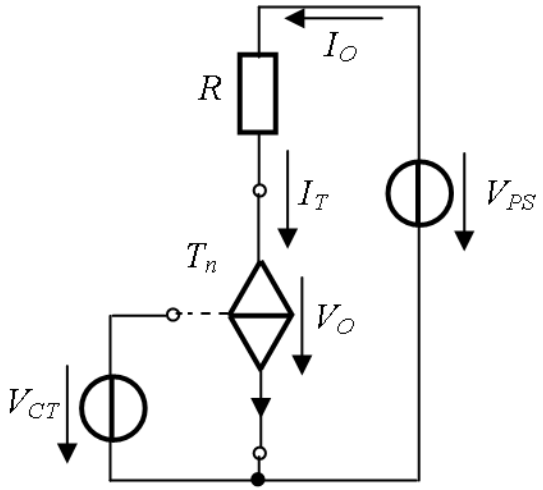
a) $V_{CT} < V_{Thn,}$ T_n – on, $I_T > 0$

b) $V_{CT} > V_{Thn,}$ T_n – on, $I_T = 0$

c) $V_{CT} < V_{Thn,}$ T_n – off, $I_T = 0$

d) $V_{CT} > V_{Thn,}$ T_n – off, $I_T < 0$

Q3



For the given schematic, the following is true:

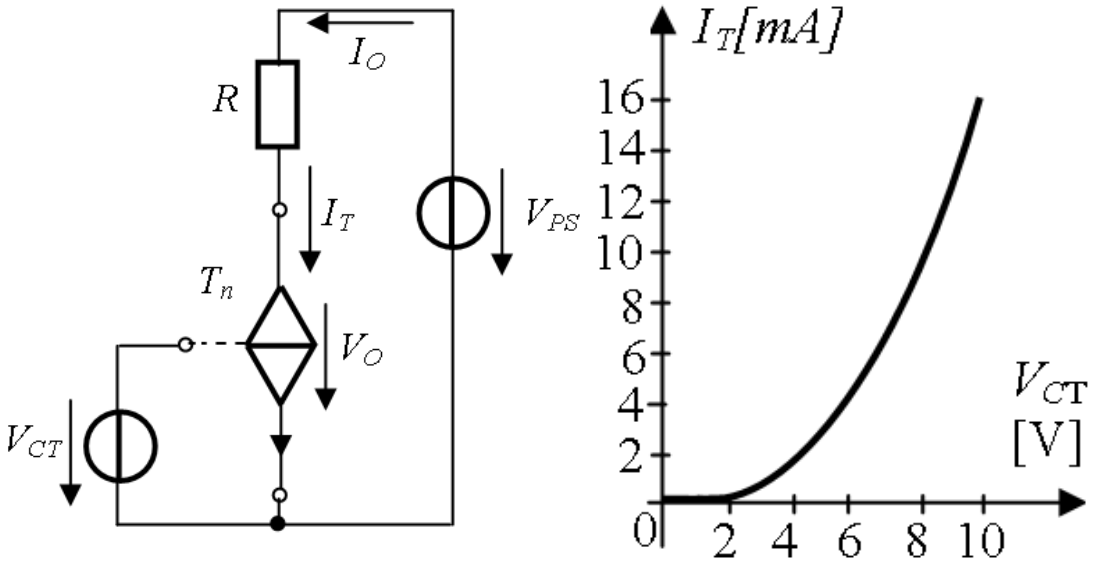
a) $V_{omax} = -V_{CT}$, $I_{Oex} = V_{PS}/R$

b) $V_{omax} = V_{CT}$, $I_{Oex} = V_{PS}/R$

c) $V_{omax} = V_{PS}$, $I_{Oex} = V_{PS}/R$

d) $V_{omax} = V_{PS}$, $I_{Oex} = -V_{PS}/R$

Q4



For the given schematic and plot, the following is true:

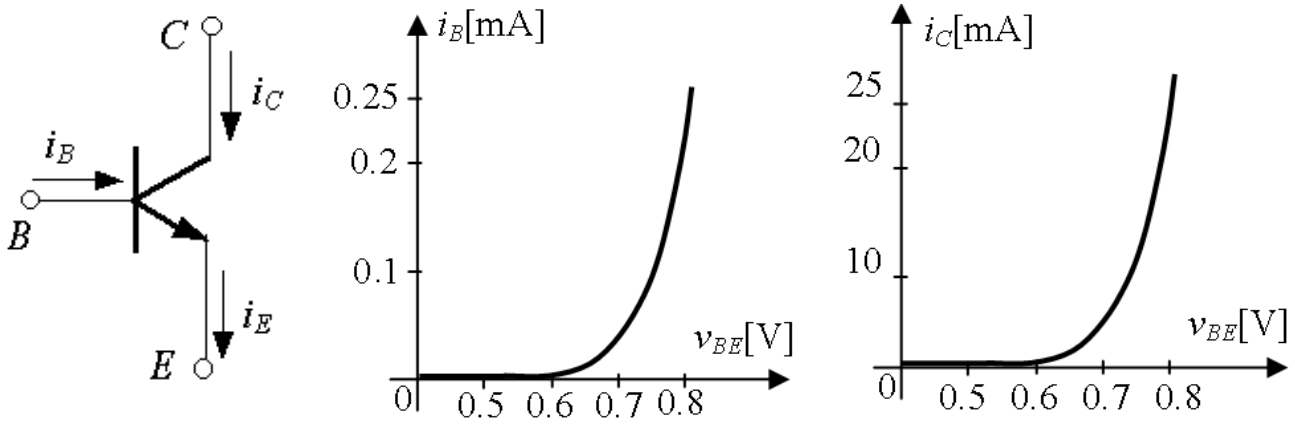
a) V_{Thn} = 10 V

b) V_{CT} = 10 V, I_T = 4 mA

c) V_{CT} = 0 V, I_T = 2 mA

d) V_{Thn} = 2 V

Q5



Based on the plots, the value for β is:

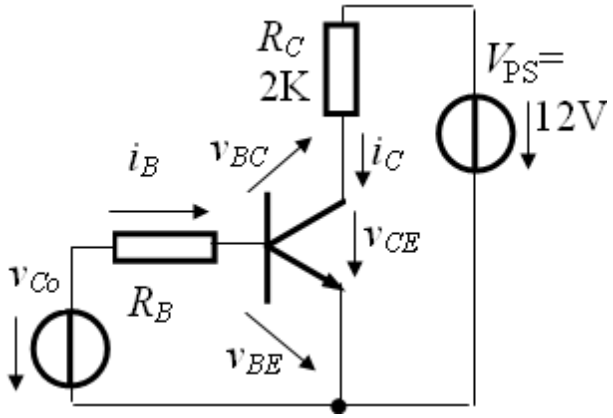
a) β = 100 mA/V^2

b) β = 100

c) β = 100 V/mA

d) β = 100 mA

Q6



For the given schematic, with $v_{Co} = 0.4$ V:

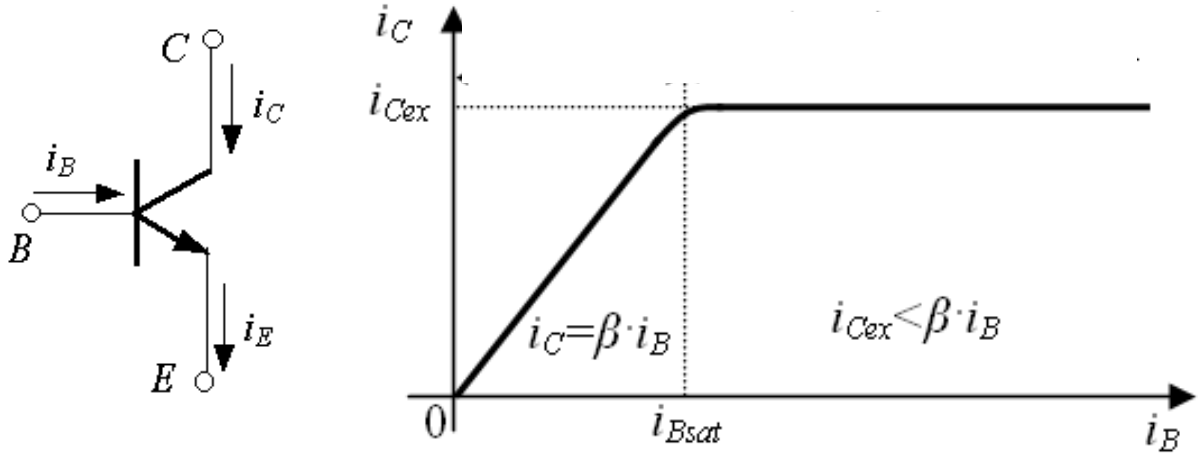
a) T – off because $v_{Co} = 0.4$ V < $V_{Th,n} = 0.6$ V

b) T – off because $v_{Co} = 0.4$ V > $V_{Th,n} = 0.6$ V

c) T – on because $v_{Co} = 0.4$ V > $V_{CEsat} = 0.2$ V

d) T – on because $v_{Co} = 0.4$ V < $V_{CEsat} = 0.2$ V

Q7



For an n-type BJT, the following is true:

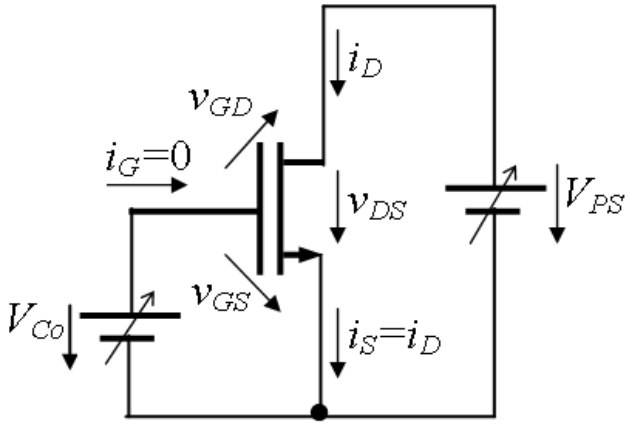
a) (a_F): $i_C = \beta i_{Bsat}$
(exc): $i_C < \beta i_B$

b) (exc): $i_C = \beta i_B$
(a_F): $i_C < \beta i_B$

c) (exc): $i_C = \beta i_B$
(a_F): $i_{Cex} < \beta i_B$

d) (a_F): $i_C = \beta i_B$
(exc): $i_C < \beta i_B$

Q8



Assuming T in (a_F), the following is true:

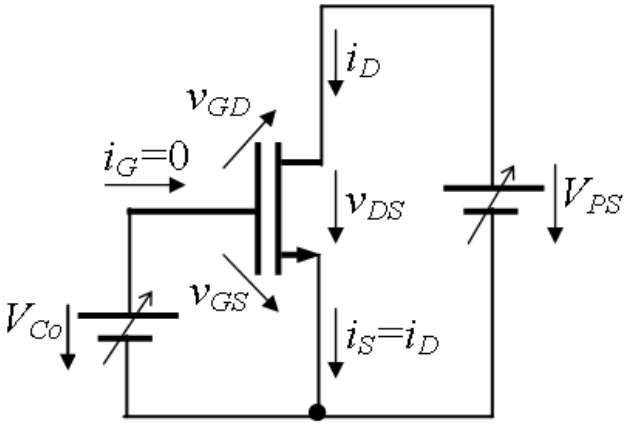
a) $v_{DS} < V_{DSsat}$

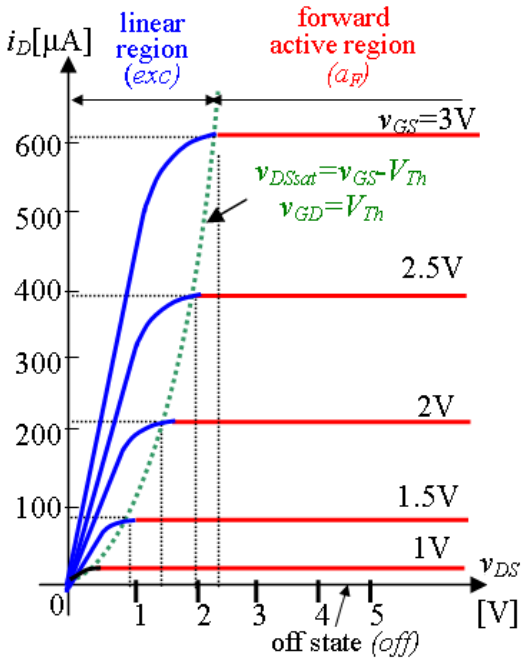
b) $i_D = \beta(v_{DS} - V_{Th})^2$

c) $v_{DS} > V_{DSsat}$

d) $i_D = \beta[2(v_{GS} - V_{Th})v_{DS} - {v_{DS}}^2]$

Q9





For V_{GS} = 2.5 V and I_D = 300 uA, the following is true:

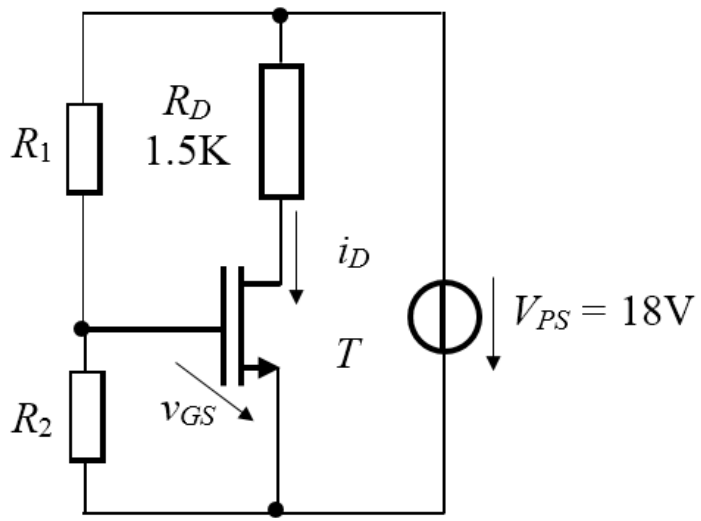
a) V_{DS} = 2.5 V, T in (a_F)

b) V_{DS} = 1 V, T in (a_F)

c) V_{DS} = 2.5 V, T in (exc)

d) V_{DS} = 1 V, T in (exc)

Q10



For V_{GS} = 9 V, the values for R_1 and R_2 can be:

a) R_1 = 1.5 MΩ; R_2 = 0.5 MΩ;

b) R_1 = 5 MΩ; R_2 = 5 MΩ;

c) R_1 = 15 MΩ; R_2 = 5 MΩ;

d) R_1 = 0.5 MΩ; R_2 = 1.5 MΩ;