

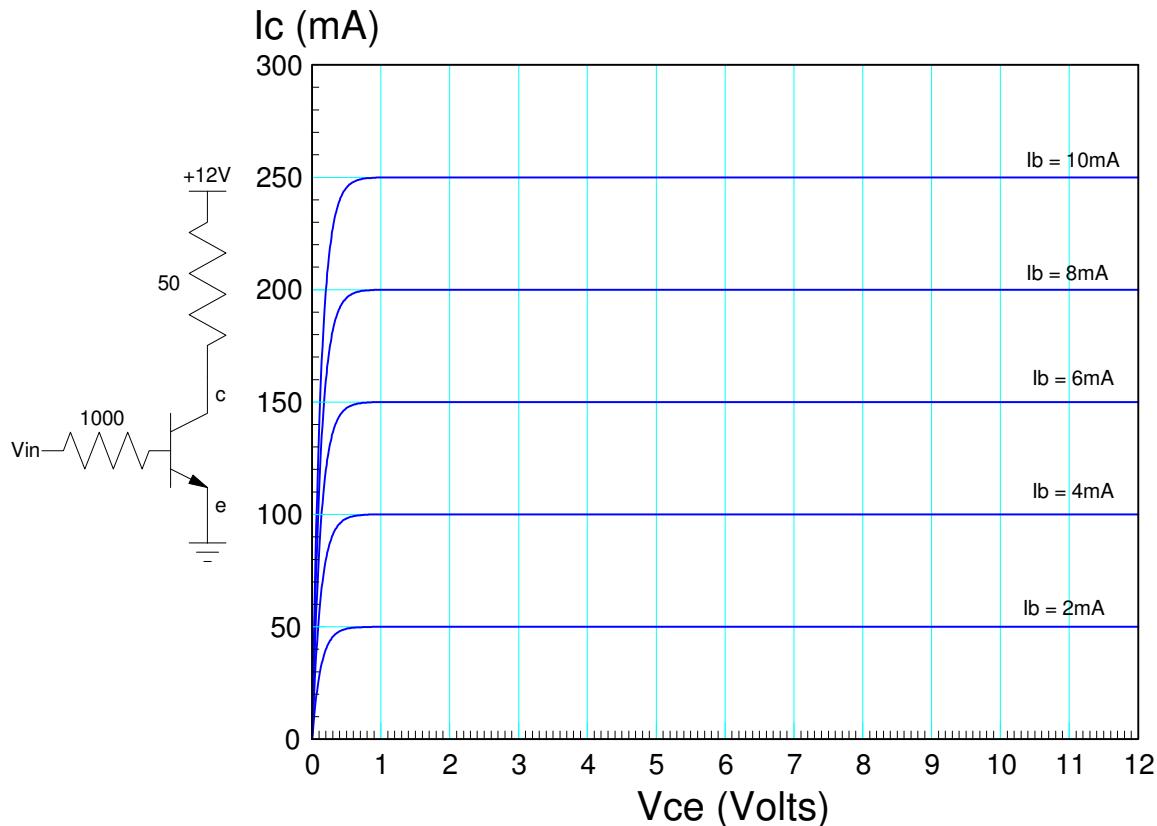
ECE 320: Handout #11

Transistors

Label the regions for the following transistor (off / active / saturated)

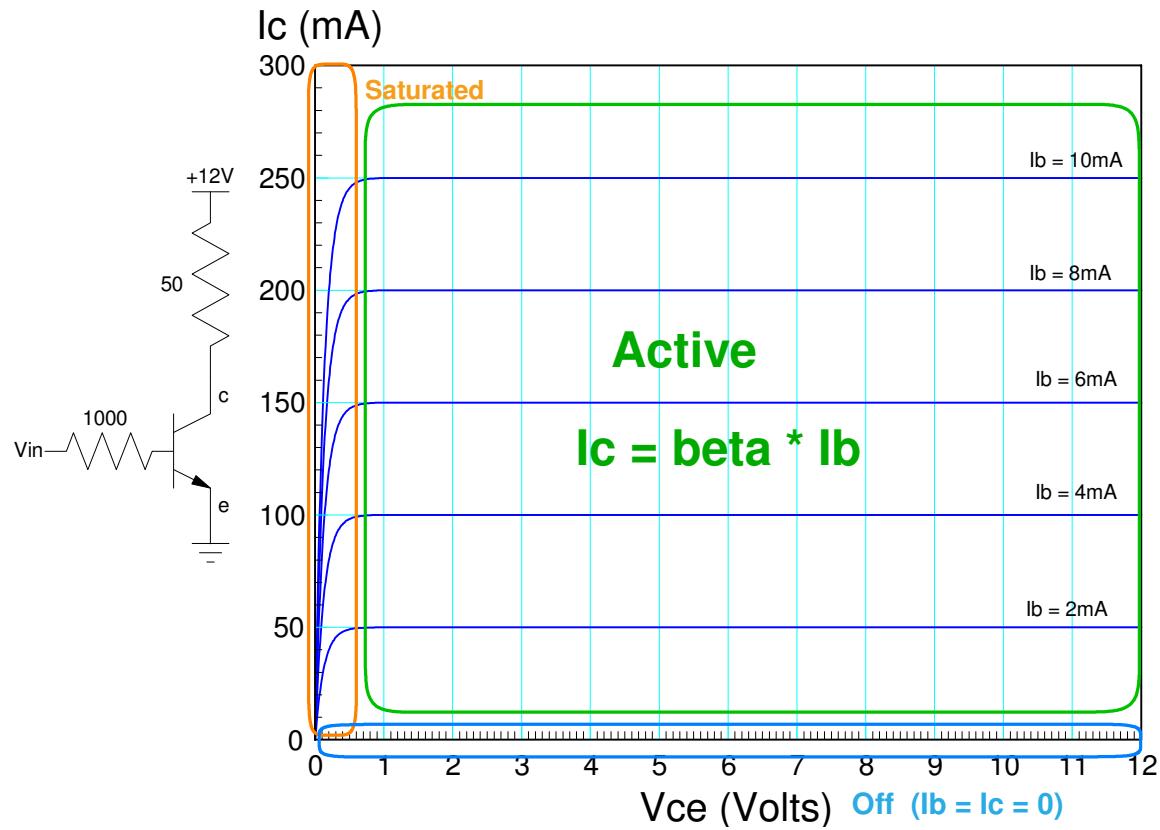
Determine

- The current gain (β) for the following transistor,
- The load line, and
- The Q-point (V_{ce} , I_c) when $V_{in} = \{0V, 5V, 10V, 15V\}$



Solution

Label the regions for the following transistor (off / active / saturated)



Solution

Determine the current gain for the following transistor,

Pick a point in the active region, such as

- $V_{ce} = 10V$, $I_b = 10mA$, $I_c = 250mA$

$$\beta I_b = I_c$$

$$\beta = \left(\frac{250mA}{10mA} \right) = 25$$

The load line (shown in orange)

The Q-point (V_{ce} , I_c) when $V_{in} = \{0V, 5V, 10V, 15V\}$

