Nolan Anderson
Module 5 Quiz

1) BJT in active mode

$V_{BE} = 0.72V$ $I_C = 4.5mA$ $V_{BE} = ?$ $I_C = 6.8mA$

$V_{BE} = 0.730$

$V_{BE} - .72 = .025 \ln\left(\frac{6.8}{4.5}\right)$

$V_{BE} = .025 \ln\left(\frac{6.8}{4.5}\right) + .72$

$V_{BE} = .7302V$

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2) $I_E = 1.208mA$ $I_C = 1.2mA$ $I_B = .008mA$

$I_E = I_B + I_C$

$I_B = I_E - I_C$

$\beta = \frac{I_C}{I_B}$ $\beta = 150$ $\alpha = \frac{150}{151} = .99$

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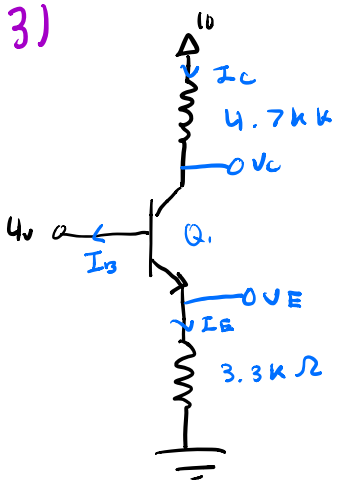
3)



$V_{BE} = .75V$

$\alpha = .99$

$I_B = 0.01mA$

$I_C = 0.975mA$

$I_E = 0.985mA$

I_C

$I_C = \alpha I_E$

$I_C = (.99)(.985)$

$I_C = .975mA$

I_E

$V_E = 4 - .75$

$V_E = 3.25V$

$I_E = \frac{3.25}{3.3E3}$

$.984mA$

9.85

I_B

$I_B = .985 - .975$

$I_B = 0.01mA$