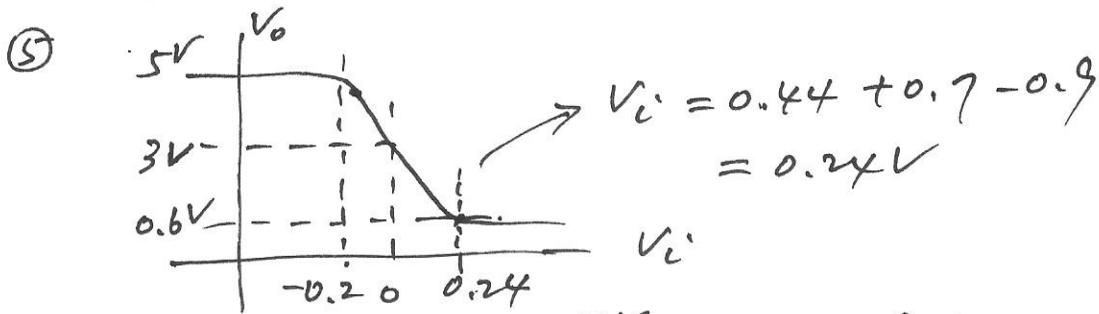


#1; (1)  $I_c = \frac{0.9 - 0.7}{1k\Omega} = 0.2mA$ ,  $V_o = 5 - 0.2mA \times 10k\Omega = 3V$

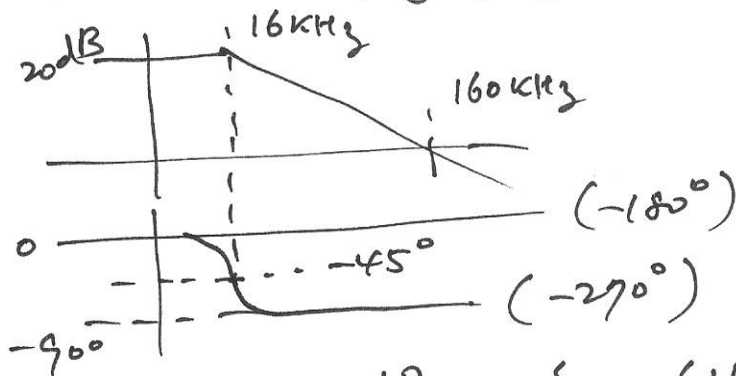
(2)  $g_m = \frac{0.2mA}{25mV} = \frac{1}{125\Omega}$ ,  $\frac{V_o}{V_i} = -\frac{g_m R_c}{1 + g_m R_E} \approx 9$

(3)  $f_{-3dB} = \frac{1}{2\pi \times 10k \times 10pF} \approx 1.6MHz$

(4)  $5V = I \times 10k\Omega + 0.2V + I \times 1k\Omega$ ,  $I \approx 0.44mA$   
 $V_o/min = 5V - 0.44mA \times 10k \approx 0.6V$

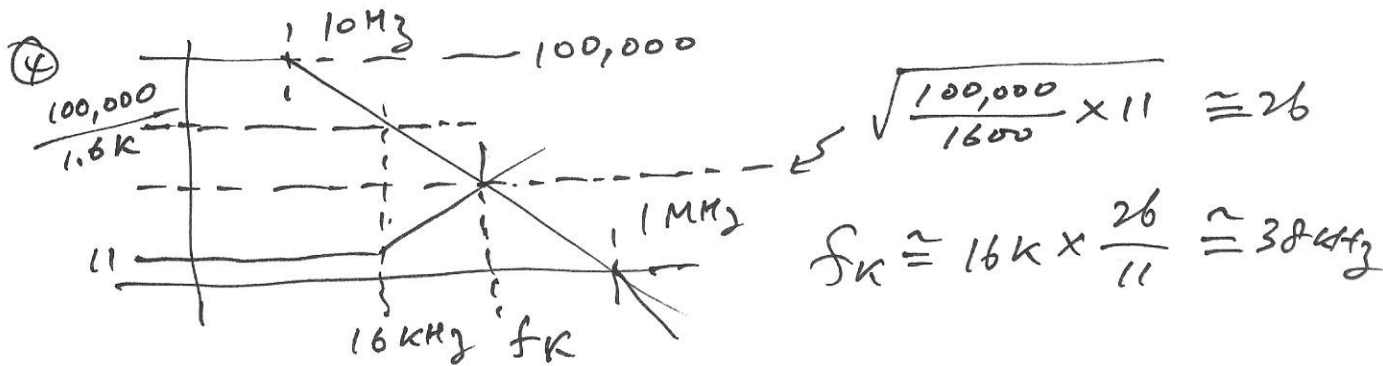


#2; (1) DC Gain =  $20 \log \frac{100k}{10k} = 20dB$ ,  $BW = \frac{1}{2\pi \times 100k \times 100pF} \approx 16kHz$



(2)  $V_o(t) = -\frac{10}{\sqrt{2}} \sin\{2\pi(16kHz)t - 45^\circ\}$

(3)  $V_o(t) = -10(1 - e^{-\frac{t}{10\mu sec}})$ ,  $\tau = 100k \times 100pF \approx 10\mu sec$



(5)  $f_{-3dB} = 1MHz \times \frac{10k}{10k + 100k} \approx 91kHz$