

國立彰化師範大學 102 學年度碩士班招生考試試題

系所： 電機工程學系

科目： 電子學

☆☆請在答案紙上作答☆☆

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1. A BJT used in a CE amplifier and biased at 2mA is specified to have $f_T = 2\text{GHz}$, $C_u = 1\text{pF}$, $r_x = 100\Omega$, and $\beta = 100$. The voltage source output resistance is neglected.
 - (a) If the midband gain obtained is -10V/V , what is the value of f_H ? (10%)
 - (b) If the midband gain is reduced to -1 V/V (by changing R'_L , where R'_L is the equivalent load resistance), what value of f_H is obtained? (10%)

2. For the circuit of Fig. 1, use the feedback method to find the voltage gain V_o/V_s , the input resistance R_m , and the output resistance R_{out} . The op amp has open-loop gain $\mu = 10^4\text{ V/V}$, $R_{id} = 100\text{ k}\Omega$, and $r_o = 1\text{ k}\Omega$. (10%,10%)

3. Explain the definitions of gain and phase margins with sketching the gain and phase Bode plots.(10%)

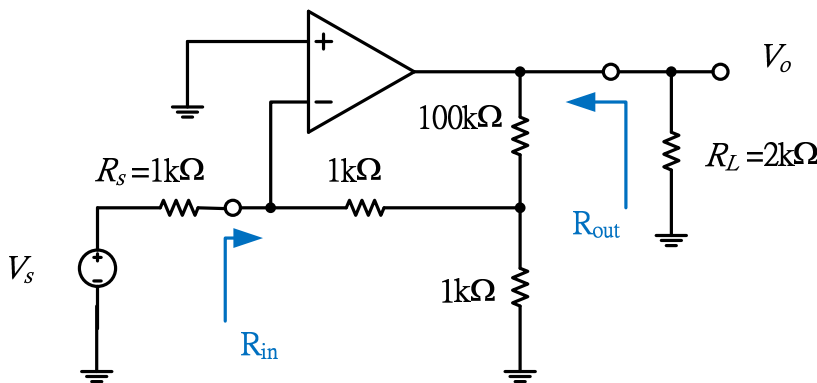


Fig. 1

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4. 名詞解釋 (1) DRAM、(2) Virtual Ground、(3) Rectifier、(4) 稽納二極體。(20%)

5. 求出下圖之輸入阻抗 R_{in} 、輸出阻抗 R_{out} 與電壓增益表示式。(30%)

