

國立臺北科技大學九十八學年度碩士班招生考試

系所組別：1521 自動化科技研究所乙組

第二節 電子學 (選考) 試題

第一頁 共二頁

注意事項：

1. 本試題共 5 題，配分共 100 分。
2. 請標明大題、子題編號作答，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

1. Find the voltage gain and input resistance R_i in Figure 1, assuming that $\beta = 100$. (15%)

(第 1 小題 8 分，第 2 小題 7 分)

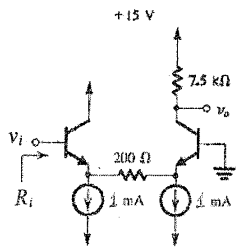


Figure 1

2. Find I_D and V_o in Figure 2: (1) $V_{IN} = 5V$ (2) $V_{IN} = 2V$. (20%) (每小題 10 分)

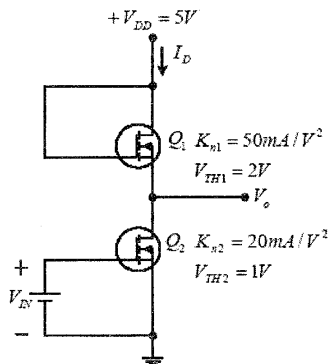


Figure 2

3. For the circuit shown in Figure 3, find I_C and V_{CE} for $V_{BE} = 0.7V$ and $\beta = 50$. (20%) (每小題 10 分)

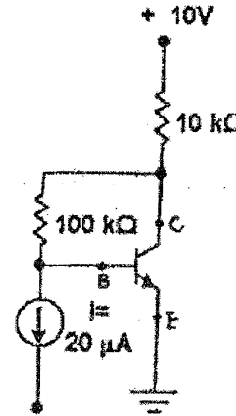


Figure 3

4. A MOS amplifier was shown as Figure 4. Please find the R_{in} , R_{out} and voltage gain. The current source is for DC bias only. Q1 and Q2 have small sign parameters as follows: the transconductances are g_{m1} for Q1 and g_{m2} for Q2, respectively. (25%)

(第 1 小題 9 分，第 2 小題 8 分，第 3 小題 8 分)

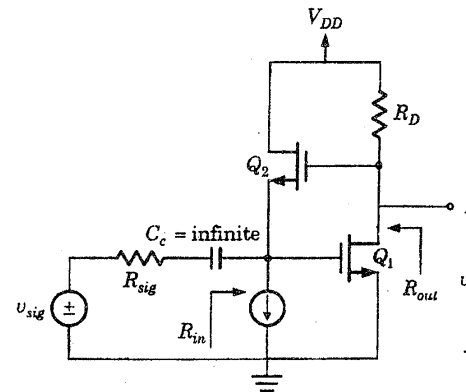


Figure 4

注意：背面尚有試題

Ans-1

5. For the circuit shown in Figure 5, $R_1 = R_2 = 10k\Omega$ and $C_1 = C_2 = 100pF$. Find the upper 3-dB frequency exactly. (20%)

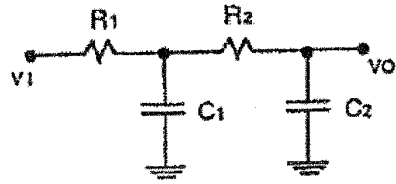


Figure 5