

國立臺北科技大學

九十六學年第二學期電機系博士班資格考試

高等類比積體電路設計試題

填學生證號碼

第一頁 共九頁

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注意事項：

1. 本試題共【8】題，配分共100分。
2. 請按順序標明題號作答，不必抄題。
3. 全部答案均須答在試卷答案欄內，否則不予計分。
4. 考試時間：二小時。



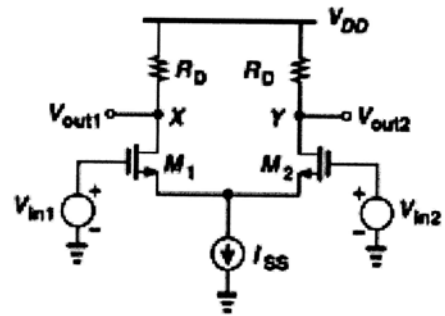
1. (10%) (a) What is the channel-length modulation effect? (b) What is the body effect?



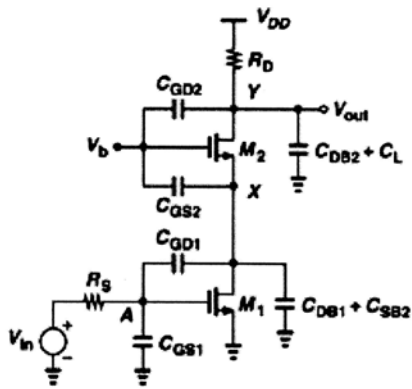
2. (10%) Sketch the circuit and layout of CMOS source follower.



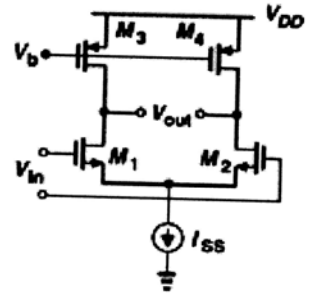
3. (10%) According to the following figure, find the differential-mode gain ($|A_{DM}|$), common-mode gain (A_{CM-DM}) and CMRR, respectively, if the output impedance of current source I_{SS} is infinity and all of the components are matched.



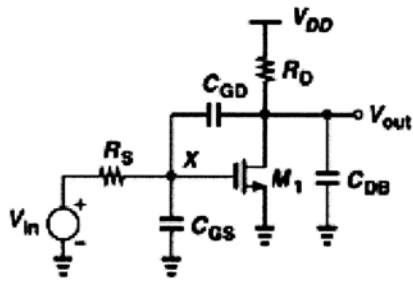
4. (15%) In the following figure, please find the three poles of this amplifier using Miller effect.



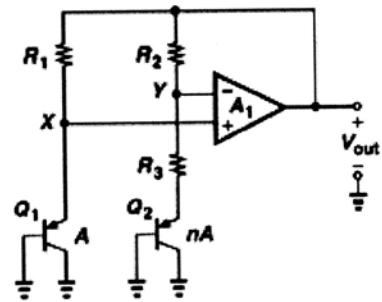
5. (10%) In the following figure, the voltage V_b is the bias voltage, please find the small-signal differential gain V_{out}/V_{in} .



6. (10%) In the following figure, use Miller effect to find the two poles and one zero, respectively.



7. (15%) Please find the output voltage V_{out} , as shown in the following figure. If V_{out} will be a reference voltage and independent to temperature, please find the condition.



8. (20%) According to the following figure, find closed-loop input resistance ($R_{i,closed}$), closed-loop output resistance ($R_{o,closed}$) and closed-loop gain ($A_{i,closed}$), respectively.

