

國立臺北科技大學九十六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

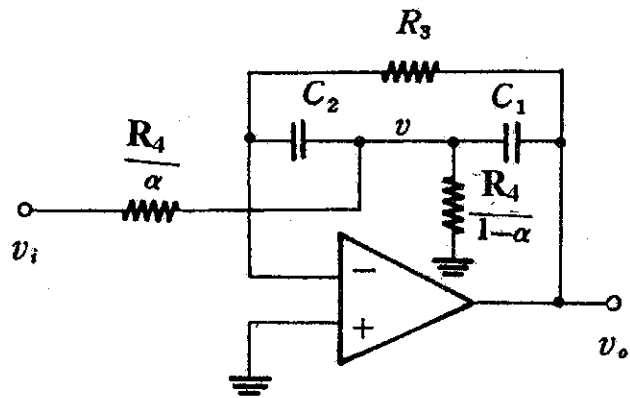
第二節 電子學 (選考) 試題

第一頁 共二頁

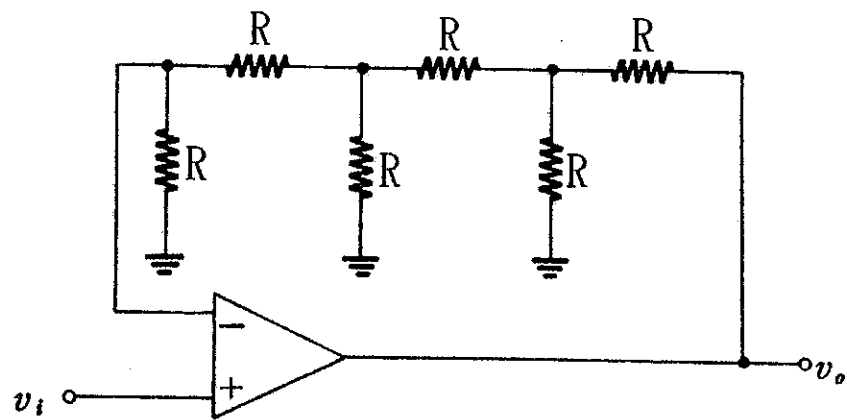
注意事項：

1. 本試題共四題，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. Suppose the OP-amp is ideal. Find the voltage gain (V_o/V_i) of the following circuits. (10% each, 20% total)

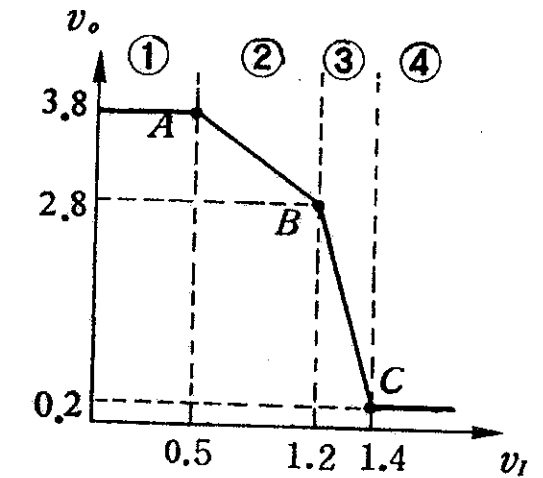
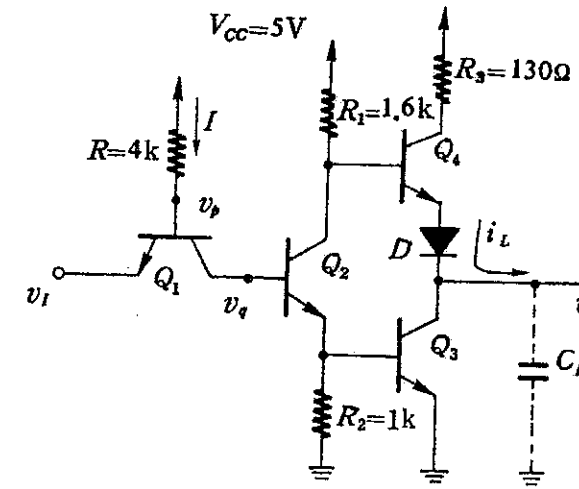


(a)



(b)

2. A standard TTL circuit is shown below. The transfer characteristic curve of this circuit is also shown.



- a) Complete the table shown below. An example is shown for region ①. (1% each, 25% total) **Please copy the following table onto your answering sheet.

元件 區域	Q1	Q2	Q3	Q4	D
①	Saturation (飽和)	Cutoff (截止)	Cutoff (截止)	Cut-in (切入)	Conduct (導通)
A					
②					
B					
③					
④					

- b) Describe the function of each component and fill the table below. (2% each, 10% total) **Please copy the following table onto your answering sheet.

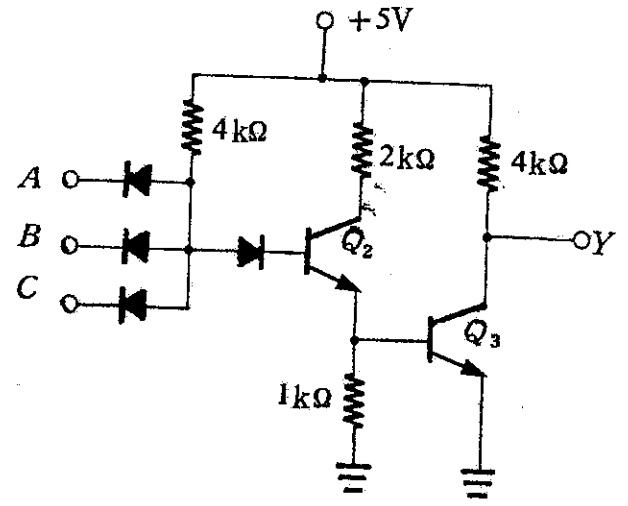
Component	Function (功能)
Q1	
Q2	
Q3	
Q4	
D	

out 2-3

3. a) For the circuit shown below, verify that $Y = \overline{ABC}$. (10%)

b) Suppose $\beta = 25$, what is the fan-out of the circuit? (15%)

$V_{D(on)} = 0.7V, V_{BE(sat)} = 0.2V.$



4. Find the logic expression for the TTL circuit shown below with detail explanation. (20%)

