國立成功大學

112學年度碩士班招生考試試題

編　號：124

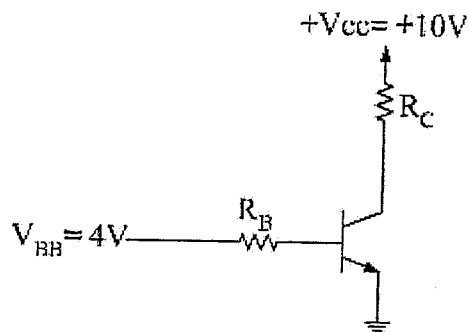系　所：工程科學系

科　目：電子電路

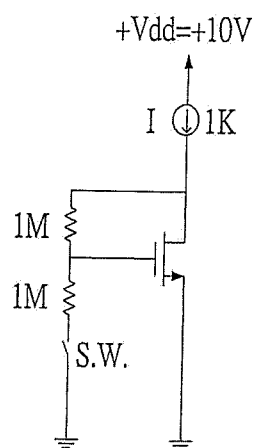日　期：0207

節　次：第 1 節

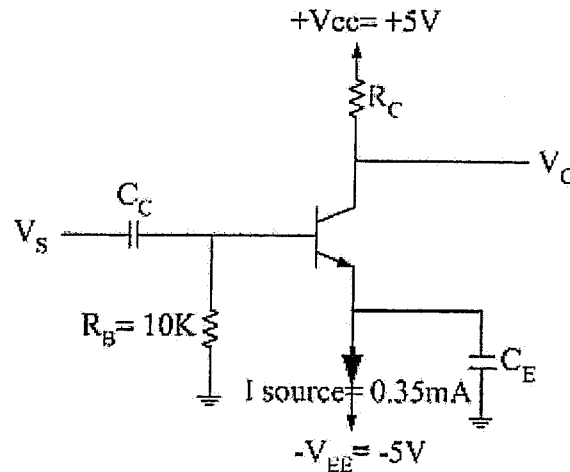備　註：可使用計算機

※ 考生請注意：本試題可使用計算機。　請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. If β is 100 and I_{BQ} is 12μA and V_{CEQ} is 5V, what are the collector resistance (5%), base resistance (5%) and collector current (5%) ?

2. It is known that when the switch (S.W) is opened (OPEN), I=6.5mA, when the switch is shorted (CLOSE), I=4mA, Vt=1.18V, try to find EMOS

(1) Kn coefficient? (10%)

(2) What is the role of the fixed power supply method added to this circuit? (10%)

3. If β is 100 and Early voltage (V_A) is 100V, please find (20%)

(a) the DC voltage at the base (V_B) and the emitter (V_E); (5%)

(b) if V_{CEQ} is 3.5V, find the value of the required collector resistance? (5%)

(c) If the bypass and coupling capacitor are shorted, find the small signal voltage gain $A_V=V_O/V_S$ (5%)

(d) If there is a 500Ω resistor in series with V_S, redo the problem in (c)? (5%)

4. If β is known to be 180 and the output resistance is ∞. (20%)

(a) the values of I_{BQ}, I_{CQ} and V_{CEQ} (5%)

(b) the small signal g_m/r_π (5%)

(c) the small signal voltage gain $A_V=V_O/V_S$? (10%)

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5. As shown in the figure, we know that β is 50. (25%)

(a) What is its maximum fan out (Fan out)? (10%)

(b) If β is not considered to be 50, what is the minimum value of β? (15%)