

# 淡江大學 99 學年度轉學生招生考試試題

系別：電機工程學系三年級

科目：電 子 學

本試題共 5 大題，2 頁

1. (20%) Figure 1 shows two diodes with reverse saturation currents of  $I_{S1}$  and  $I_{S2}$  placed in series. Calculate  $I_B$ ,  $V_{D1}$ , and  $V_{D2}$  in terms of  $V_B$ ,  $I_{S1}$ , and  $I_{S2}$ .

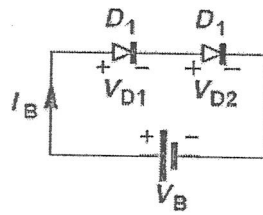


Fig.1

2. (20%) Plot the I/V characteristic of the circuit shown in Fig. 2. Assume  $V_{D,on} = 800$  mV

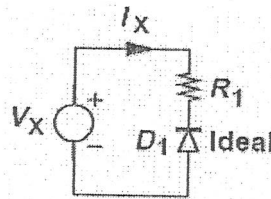


Fig. 2

3. (20%) As shown in Fig. 3, find the impedances of three circuits by using small signal model.

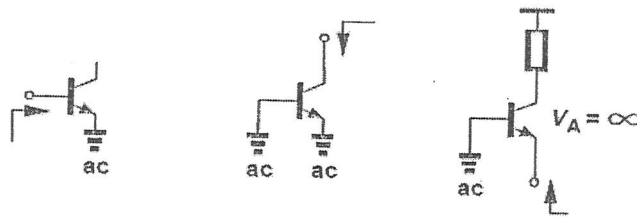


Fig. 3

4. (20%) Design the circuit of Fig. 4 so as to provide a transconductance of  $1/(52\Omega)$  for  $Q_1$ . Assume  $V_{CC} = 2.5$  V,  $\beta = 100$ , and  $I_S = 5 \times 10^{-17}$  A. What is the maximum tolerable value of  $R_C$ ?

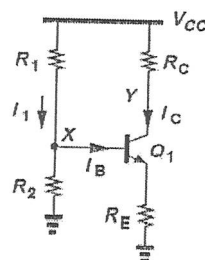


Fig. 4

本試題雙面印刷

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5. (20%) As shown in Fig. 5, find the impedances of two circuits by using small signal model.

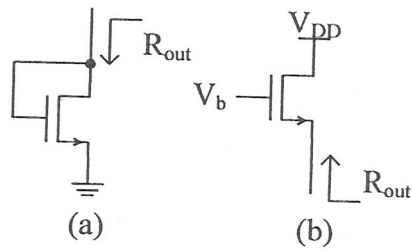


Fig. 5