

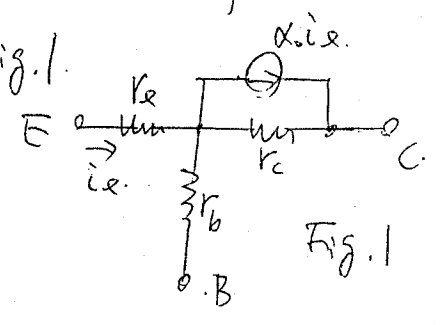
淡江大學八十七學年度夜間部轉學生入學考試試題

系別：電機工程學系三年級

科目：電子學

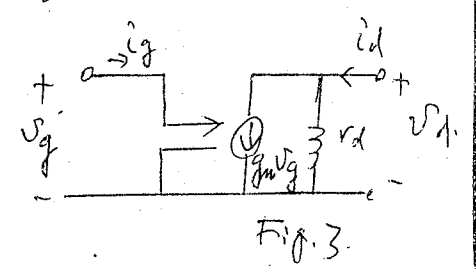
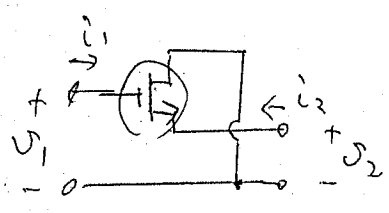
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1(a) Derive T-type equivalent circuit of common emitter and common-collector from T-type equivalent circuit of common base of transistor which is shown in Fig.1.



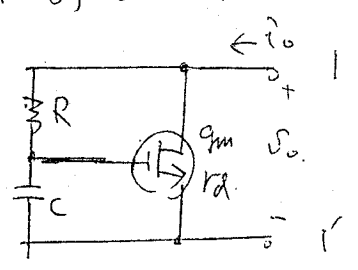
1(b) Derive the equivalent circuit of source follower circuit shown in Fig.2 based on the equivalent circuit of common source which is shown in Fig.3

Fig.2

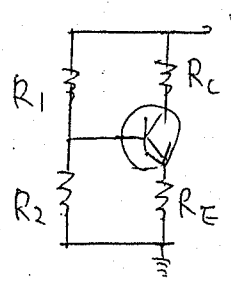


2. Find the output admittance Y_o from terminal 1-1' of circuit which is shown in Fig.4. But the parameters of FET are known.

Fig.4



3(a) Determine V_E, I_B, I_E, V_B, V_C of the circuit shown in Fig.5



- $R_1 = 30k\Omega$
- $R_2 = 6k\Omega$
- $R_E = 1k\Omega$
- $R_C = 5k\Omega$

where the parameters of transistor are given as $r_b = 500\Omega, h_{FE} = 99, V_{BE} = 0.6V$

Fig.5

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3.

(b) For the common emitter circuit shown in Fig. 6. Determine

(i) Voltage gain $A_v = \frac{V_2}{V_1}$ (ii) input impedance $Z_i = \frac{V_1}{i_1}$

(iii) output impedance $Z_o = \frac{V_2}{i_2} \Big|_{V_1=0}$. But the parameters of

transistor are given as $r_b = 500 \Omega$, $r_e = 25 \Omega$

$r_c = \infty$, $h_{fe} = 99$ and

the impedance of capacitor C_1, C_2 are extremely small.

$R_1 = 140 k\Omega$, $R_c = 10 k\Omega$
 $R_2 = 10 k\Omega$, $R_E = 1 k\Omega$

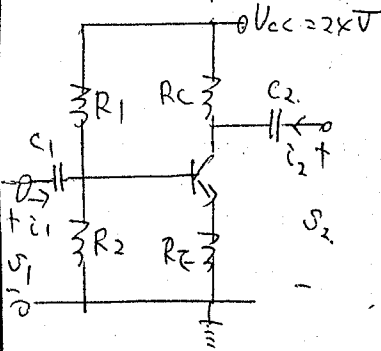


Fig. 6

4.

For the circuit shown in Fig. 7. Determine

(i) input impedance $Z_i = \frac{V_1}{i_1}$

(ii) voltage gain $A_v = \frac{V_2}{V_1}$

(iii) output impedance

$Z_o = \frac{V_2}{i_2} \Big|_{V_1=0}$

