

$f_{\text{switch}} = 100\text{KHz}$, $L_p = 100\mu\text{H}$, $L_s = 200\mu\text{H}$, P_o (output power) = 72 Watts. Assume ideal components

(8%) 1. Determine duty cycle value. Is this a continuous conduction mode (why)?

(20%) 2. Sketch waveforms $i_p(t)$, $i_s(t)$, $v_D(t)$, $i_C(t)$ and determine the peak value of each waveform

(6%) 3. If the switches were non-ideal, the transistor voltage drop is V_Q when it's conducting, and the diode voltage drop is V_D when it's conducting, find the expression for the duty cycle D in terms of V_Q , V_D and other variables. If $V_Q = 1\text{V}$, $V_D = 1.1\text{V}$, what's the exact value of D ?

4. A generator with reactance $X_d = 1.6$ and $X_q = 0.9$ delivers $S_G = 1\angle 45^\circ$ to a bus with voltage $V_a = 1\angle 0^\circ$, find

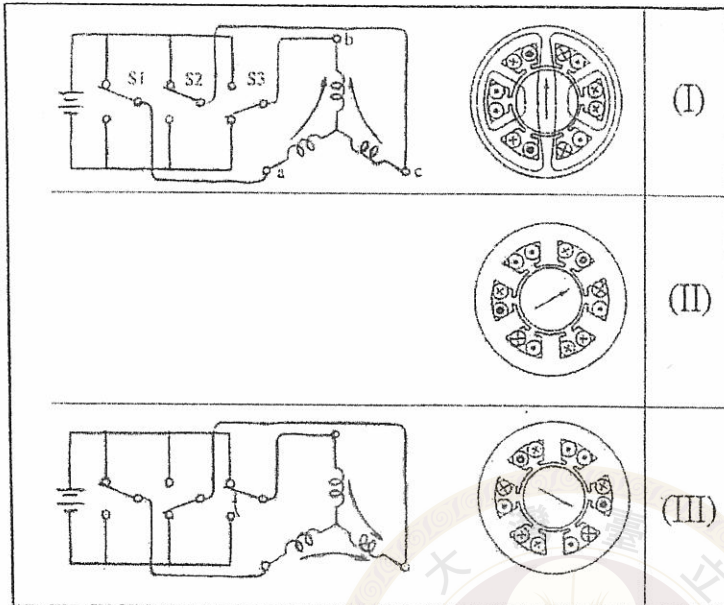
(a) I_{ad} . (10分)

(b) the rotor angle θ_0 (i.e. the rotor angle θ at $t=0$) (13分)

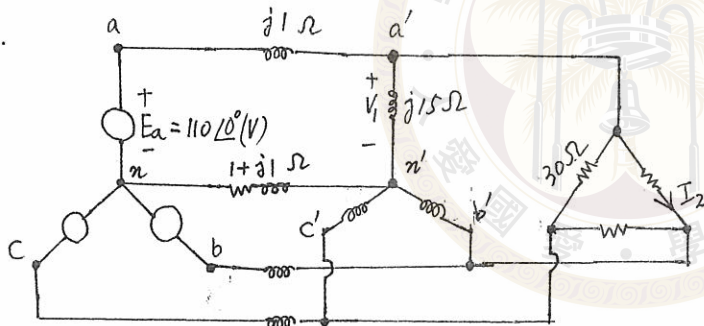
見背面

5. Please draw the circuit diagram of (II) which indicates the states of switches.

(10分)

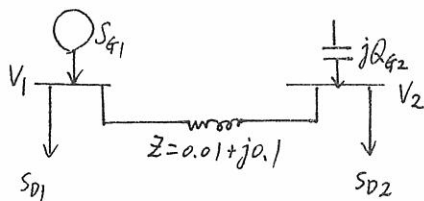


6.



左圖所示為一平衡三相電力系統。
試求 V_1 及 I_2 。(12%)

7.



左圖為一電力系統之單線圖。若 $V_1 = 1 \angle 0^\circ$,
 $|V_2| = 1$, $S_{D1} = 0.6 + j0.6$, $S_{D2} = 0.6 + j0.6$,
試求 Q_{g2} 。(11%)
(註: $S = VI^*$)

8.

有一圓極同步發電機，其電樞電阻可忽略不計，同步電抗 $X_s = 1$ 。
將此發電機之端點與無限匯流排 ($V_\infty = 1 \angle 0^\circ$) 並聯之瞬間，發電機之
場電流 $i_F = i_F1$ 。若維持場電流之大小固定不變，逐漸將汽輪機
送到發電機之機械功率增加到 P_g (發電機輸出之實功) = 0.35 為止。
試求此時發電機之電樞電流 I_a 。(10%)

試題隨卷繳回