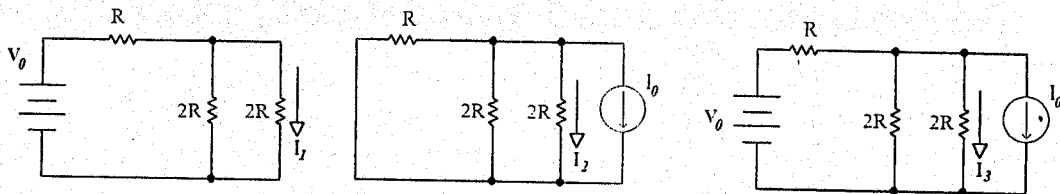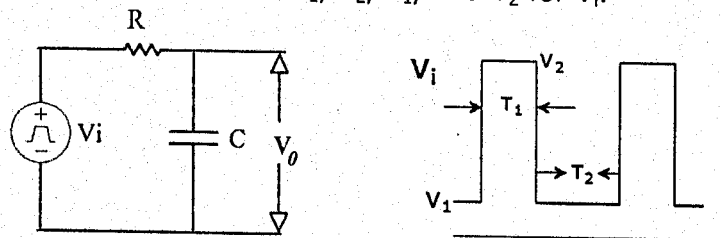所別：光電科學研究所碩士班 一般生 科目：電子學
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15% 1. Find the currents, I_1, I_2, and I_3 in terms of V_0, I_0, and R. Then, express the relation among I_1, I_2, and I_3.


15% 2. Refer to the circuit below. Please discuss the characteristics of the output V_o in terms of the parameters of V_1, V_2, T_1, and T_2 for V_i.

15% 3. Simplify the logic circuit with as few logic gates as possible (AND, OR, and NOT gates only). A and B are two input ports, and X is the output port.
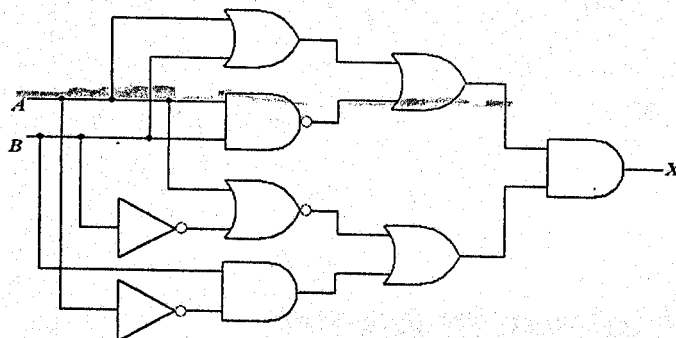
20% 4. Derive the electric current, I_f, through LEDs. If each LED has a voltage drop V_f, evaluate the maximum possible number of LEDs.
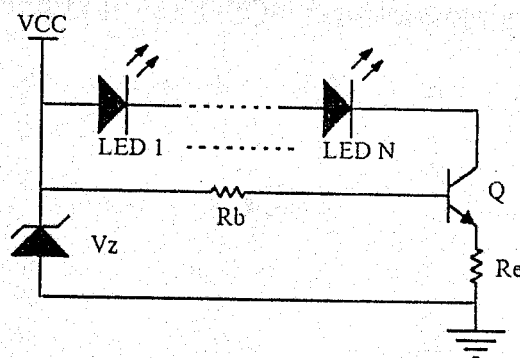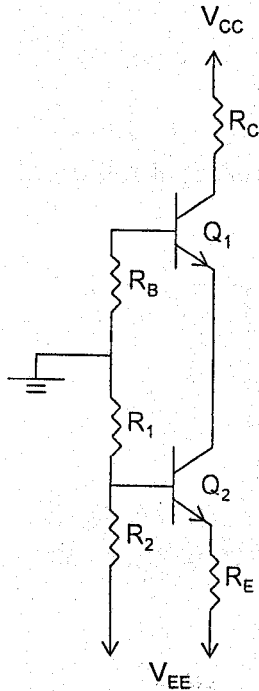

注意：背面有試題

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20% 5.Please design the BJT circuit, and find out R_1, R_2, R_B, R_C, R_E :

(1)When current gain β is infinity, $I_{C1}=0.1mA$、$V_{RE}=2V$ and $V_{CE1}=1.5V$;

(2)When current gain β is 50, $V_{CE1}=2.5V$ and V_{R_E} reduced 5%

15% 6.Please find out these circuit symbols :

(1)Zerner Diode (2)npn BJT (3)p-channel MOSFET

(4)n-channel depletion-type MOSFET(5)n-channel JFET