

國立臺北科技大學 109 學年度碩士班招生考試

系所組別：1111 機械工程系機電整合碩士班甲組

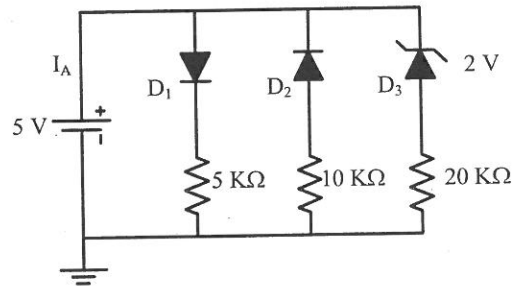
第二節 電子學 試題 (選考)

第 1 頁 共 1 頁

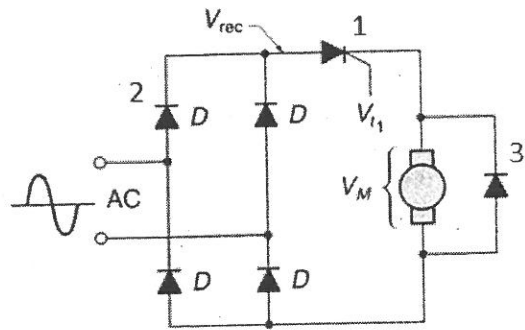
注意事項：

1. 本試題共六題，每題 10~20 分(依各題標記說明)，共 100 分。
2. 不必抄題，作答時請將試題題號及答案依照順序寫在答案卷上。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

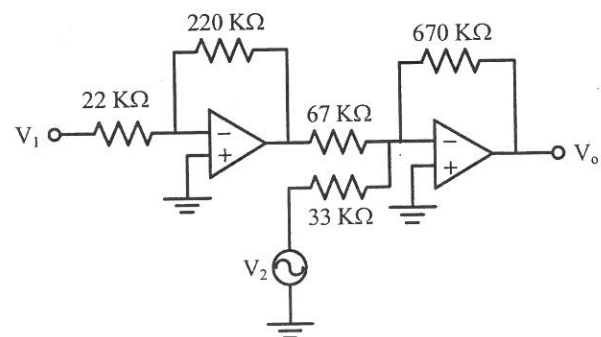
1. 10% For the circuit shown in the figure, calculate the total current I_A supplied by the 5V DC source.



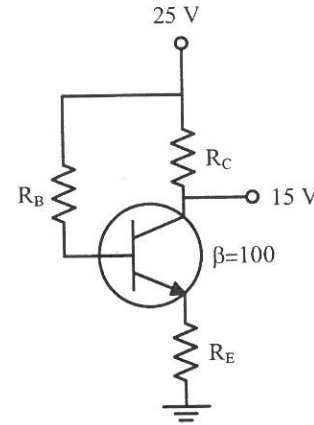
2. 15% Describe the function of diode components 1/2/3 in the following diagram.



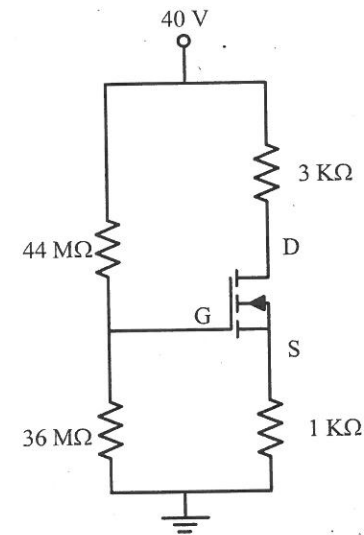
3. 15% Determine the average voltage, the oscillating frequency and amplitude of the output voltage V_o of the circuit shown in the figure if $V_1 = 12 \text{ mV}$ and $V_2 = 18 \cdot \sin(120\pi t) \text{ mV}$.



4. 20% An emitter-biased circuit shown in the figure has been designed to meet the following specification: $I_{CQ} = 0.5 I_{sat}$, $I_{sat} = 8 \text{ mA}$, $V_C = 15 \text{ V}$ and $\beta = 100$. Determine the resistance R_C , R_B , and R_E .



5. 20% Determine the I_{DQ} , V_{GSQ} and V_{DS} for the network shown in the figure. In which, $V_{GS(on)} = 5 \text{ V}$, $I_{D(on)} = 3 \text{ mA}$ at $V_{GS(on)} = 10 \text{ V}$.



6. 20% For the small signal analysis of an emitter-follower network shown in the figure, determine (a) r_e , (b) Z_i , (c) Z_o , (d) A_v , (e) A_i

