國立臺北科技大學 111 學年度碩士班招生考試

系所組別：1502 自動化科技研究所
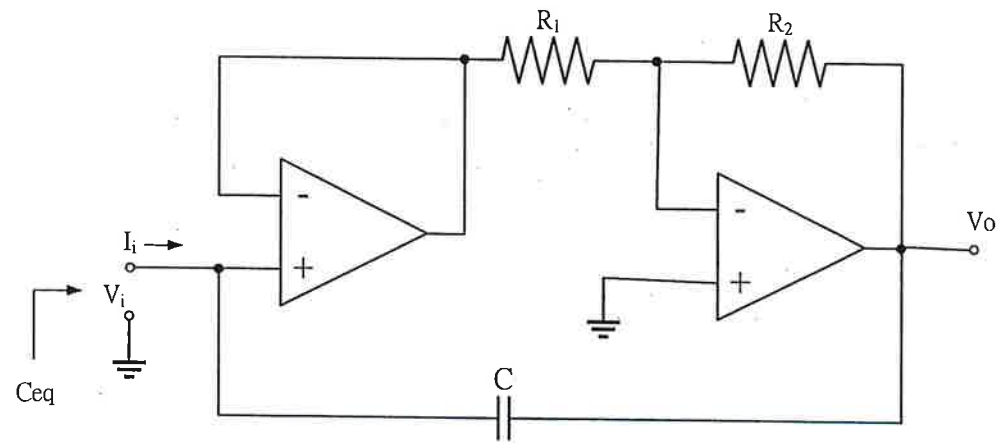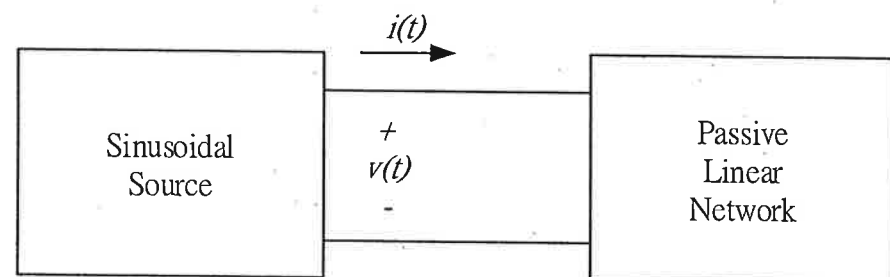
第二節　電子學　試題（選考）

注意事項：

1. 本試題共五題，每題 20 分，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。

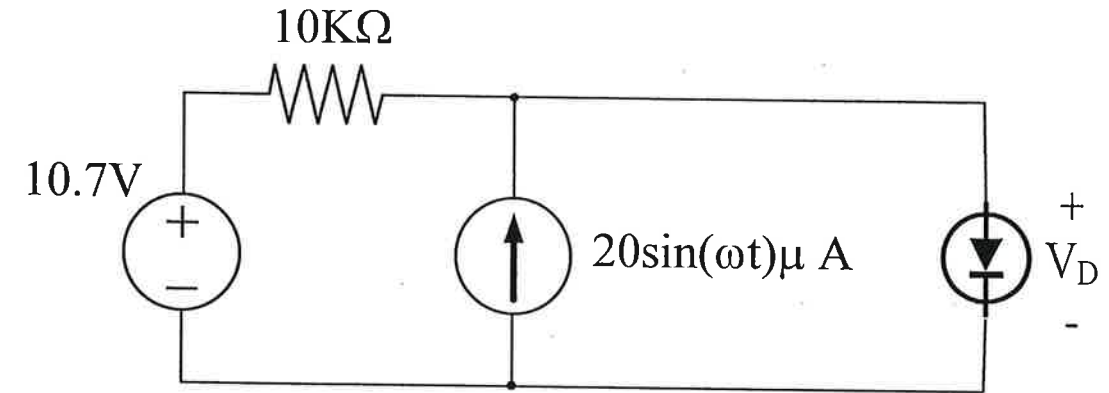1. Calculate C_{eq} for the circuit shown below with $R_1=10k\Omega$, $R_2=1M\Omega$, and $C=1nF$. (20%)
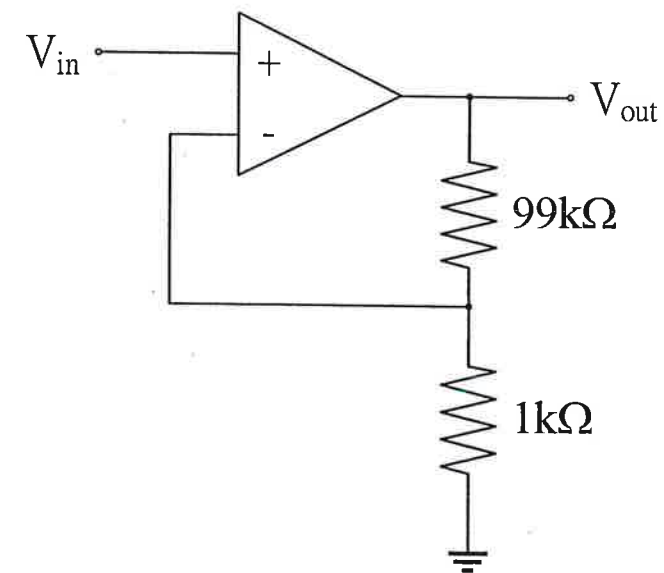

2. Given that $v(t)=120\cos(377t+50°)$V, and $i(t)=10\cos(377t-10°)$A, find the instantaneous power and the average power absorbed by the passive linear network. (20%)

3. Assume the built-in potential of the diode is 0.7V. The small signal resistance, r_d, of the diode is 25Ω. Draw the DC equivalent circuit and the small signal equivalent circuit, (5% each), and find the diode voltage, V_D, for the circuit shown below. (10%)

4. Suppose the unit gain band width of the OP amp is, $f_T = 3MH$, find the bandwidth of the circuit shown below. (20%)

注意：背面尚有試題

5. Suppose $V_{in}=2\sin(\omega t)$ V, the rms value of the output, V_{out}, is 2.828V for the circuit shown below. Find the value of R_1. (20%)