國立臺北科技大學九十八學年度產業研發碩士專班招生考試

系所班別：光電與通訊產業研發碩士專班

111 電子學 試題

填 准 考 證 號 碼

注意事項：

1. 本試題共 **5** 題，配分共 100 分。
2. 請標明大題、子題編號作答，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

一、Using the simple constant-volage-drop (0.7V) for each of the diodes, find the transfer characteristic of the circuit shown in Fig. 1. (20 分)

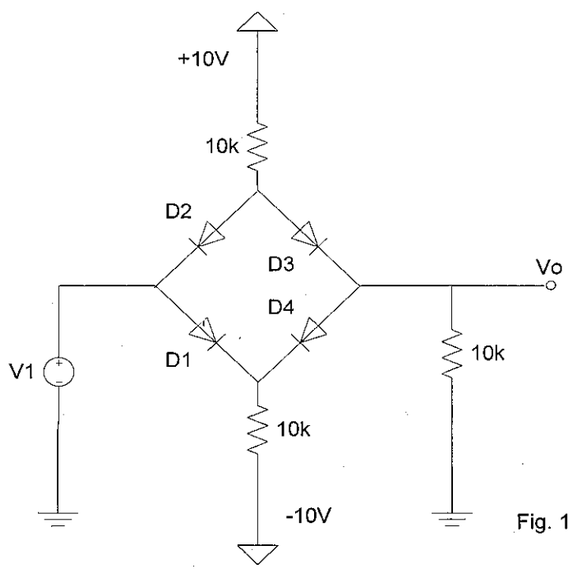


Fig. 1

二、The triangle wave generator shown in Fig. 2. consist of two identical operational ampliers' whose saturation output voltage can be expressed as V_{Sat} =(suppy voltage) - 1.5 = 15 - 1.5 = 13.5 V.

1. Find the waveforms of the output voltages V_{o1} and V_{o2} ,if switch S_1 is kept closed and switch S_2 open. Draw the waveforms to the same horizontal time-scale. Determine the qositive negative peak values'and the frequency for V_{o2} (10 分)
2. Repeat(1), if S_1 is kept open while S_2 closed. (10 分)

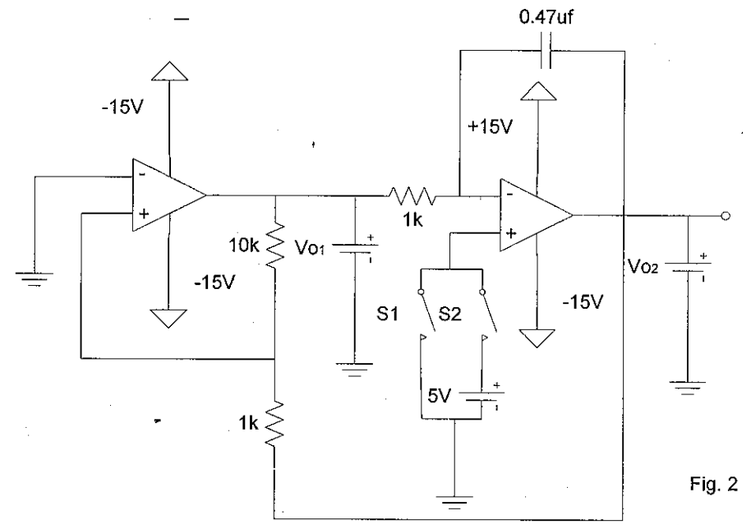


Fig. 2

注意：背面尚有試題

三、1. For the fad back network shown in Fig. 3 find the transfer function V_f / V_o. (6 分)

2. This network is used with an AMP to form an oscillator. Find the frequency of oscillation and the minimum amplifier gain. (7 分)

3. Draw the network connected to the OP AMP to form oscillator. (7 分)

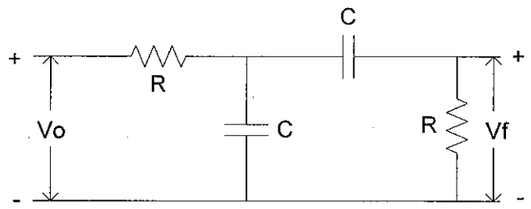
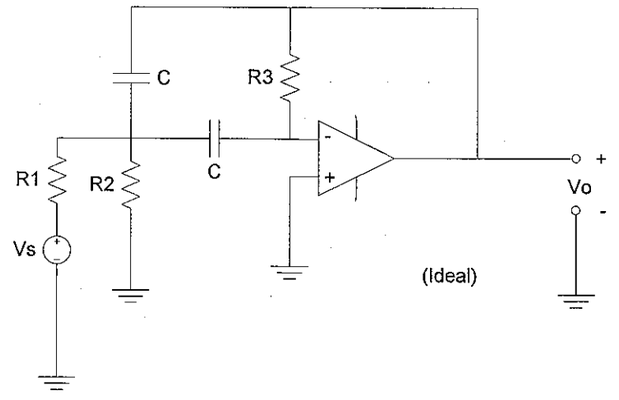


Fig. 3

四、An active RC Band-pass filter as shown, verify $\frac{V_o(s)}{V_s(s)} = \frac{-S/R_1C}{S^2 + \left(\frac{2}{R_3C}\right)S + \frac{1}{R'R_3C^2}}$

where $R' = \frac{R_1R_2}{R_1 + R_2}$ (20 分)



五、For the circuit shown below, find Z_{in} = ? (20 分)