

國立臺北科技大學九十九學年度碩士班招生考試

系所組別：2120 電機工程系碩士班乙組

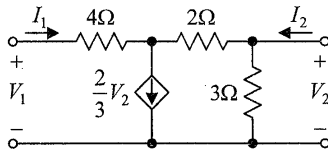
第一節 電路學 試題

第一頁 共一頁

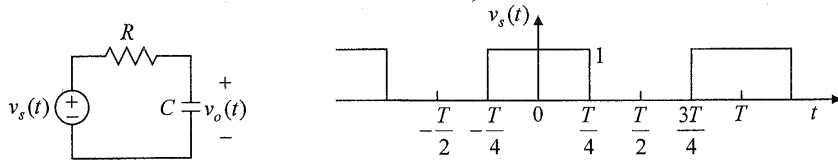
注意事項：

1. 本試題共 8 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。

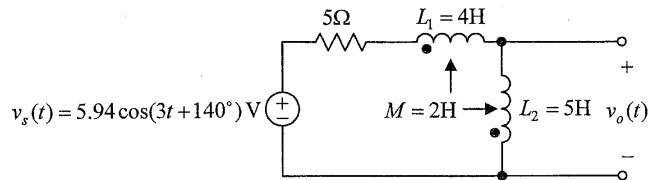
1. Determine the 'z' parameters of the following circuit. (20%)



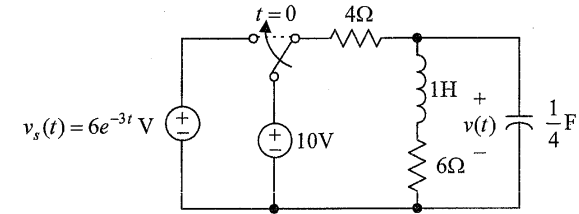
2. Find the steady-state response, $v_o(t)$, of the following RC circuit. The input, $v_s(t)$, is the square wave shown in the following. And this square wave is represented by the first four terms of its Fourier series. Assume that the parameters of the circuit are $R = 1\Omega$ and $C = 2F$ and that the period of the square wave is $T = \pi$ seconds. (20%)



3. Determine the following output voltage, $v_o(t)$. (15%)



4. A customer's plant has two parallel loads connected to the power utility's distribution lines. The first load consists of 50kW of heating and is resistive. The second load is a set of motors that operate at 0.86 lagging power factor. The motors' load is 100kVA. Power is supplied to the plant at $10kV_{rms}$. Determine the total current flowing from the utility's lines into the plant and the plant's overall power factor. (15%)
5. Find the complete response $v(t)$ for $t > 0$ for the following circuit. Assume the circuit is at steady state at $t = 0^-$. (15%)



6. What constraints are required when the phasor concept is applied to the circuit? (5%)
7. From the point of view of a circuit, how to obtain the amplitude and phase angle plots of the Bode plot based on experimental measurements? (5%)
8. What types of responses can be obtained using the Laplace transform concept? (5%)