

國立彰化師範大學104學年度碩士班招生考試試題

系所： 工業教育與技術學系

乙組選考丙

科目： 電路學

☆☆請在答案紙上作答☆☆

共 2 頁，第 1 頁

1. Find $v_o(t)$ of the circuit in Fig. 1 (10%)

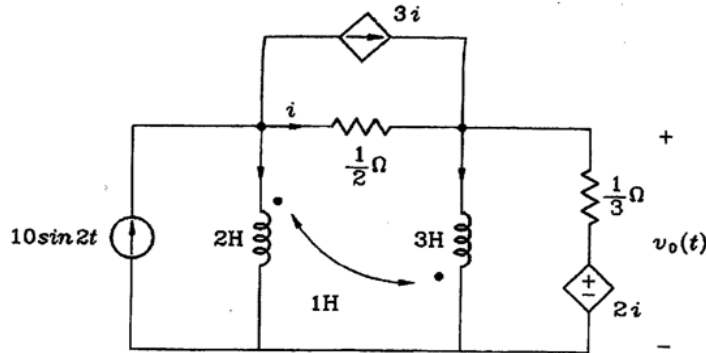


Fig. 1

2. Use mesh analysis to decide i_1 , i_2 and i_3 in Fig. 2, where $V_1=3V$; $A_1=4A$; $R_1=2\Omega$; $R_2=1\Omega$; $R_3=4\Omega$; $R_4=1\Omega$; $R_5=1\Omega$;

(a) Formulate mesh analysis in matrix form, i.e., $M \times \begin{bmatrix} i_1 \\ i_2 \\ i_3 \end{bmatrix} = \begin{bmatrix} y_1 \\ y_2 \\ y_3 \end{bmatrix}$, where y_1, y_2, y_3 , and all entries of matrix M must be scalar. (10%)

(b) Solve the equations and obtain i_1 , i_2 , and i_3 . (10%)

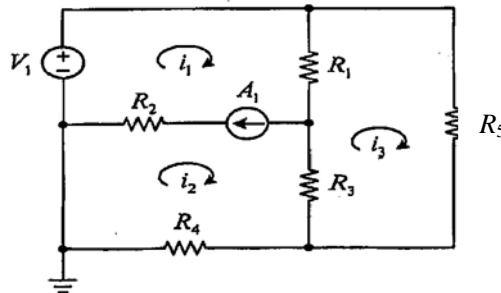


Fig. 2

3. As the circuit shown in Fig. 3 for $v_{in}=50$ Vdc, $R_1=R_2=500\Omega$, and $C_1=C_2=2\mu F$, find the total solution for $v_{out}(t)$. (20%)

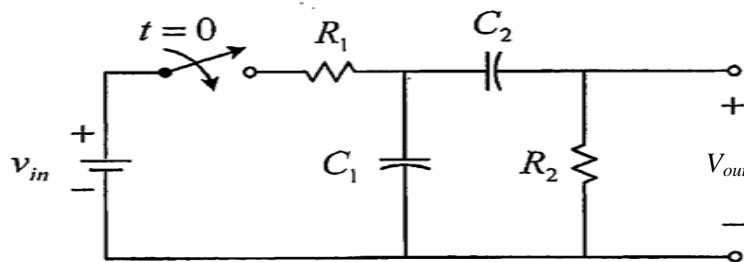


Fig. 3

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共 2 頁，第 2 頁

4. Find the indicated response current in Fig. 4 using superposition. (10%)

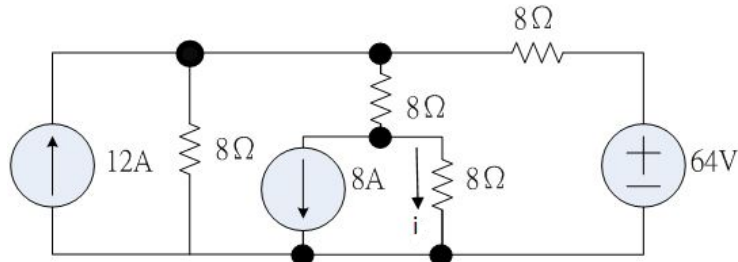


Fig. 4 Circuit

5. Solve for the node voltages V_1 and V_2 . (15%)

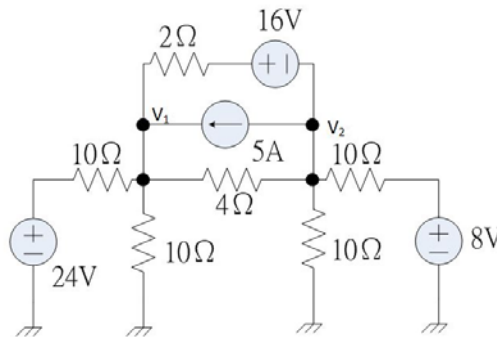


Fig. 5 Circuit

6. Find the value of i in the circuit in Fig. 6 using nodal analysis. (15%)

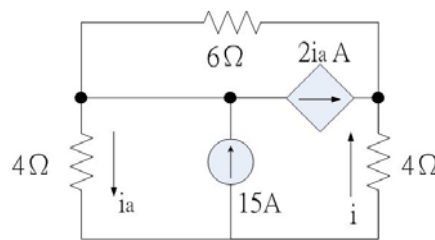


Fig. 6 Circuit

7. The current source in Fig. 7(a) has the waveform shown in Fig. 7(b). Find and sketch the waveform for the capacitor voltage $v(t)$. (10%)

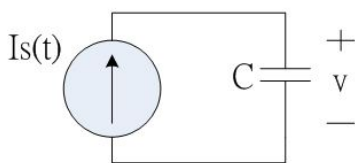


Fig. 7 (a) Circuit

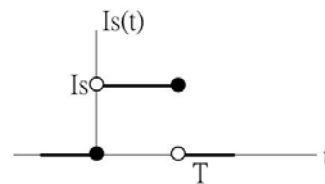


Fig. 7 (b) Source waveform