台灣科技大學一百零八學年度下學期平時考（二）

科目名稱：電路學(二)　開課系所：電子系 ET2104301　地點：國際大樓 IB306

考試時間：109 年 5 月 21 日　下午 13:20 至 15:10 (不可使用工程計算機)

1. (5%) Please find the inverse Laplace transform of the following transfer function:

$$F(s)=\frac{(s+4)(s+8)}{s(s^2+4s+8)}$$

2. (5%) Please find the Laplace transform of the following function:

$$f(t)=[2e^{-t}\cos 2t+5e^{-t}\sin 2t]q(t)$$

3. (20%) A second-order circuit in Fig. 1 is assumed to be in a steady-state condition prior to switch at $t=0$. Please use the Laplace transforms to calculate the voltage $v_o(t)$ for $t>0$.

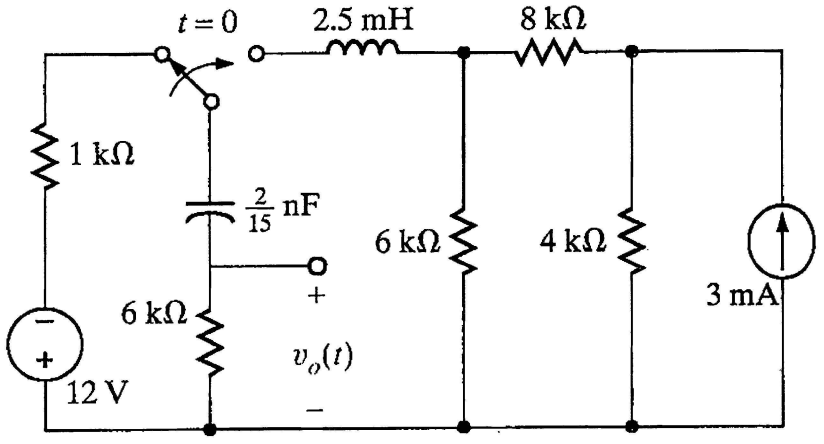

Fig. 1.

4. (15%) Please find $v_o(t)$ for $t>0$ in Fig. 2.

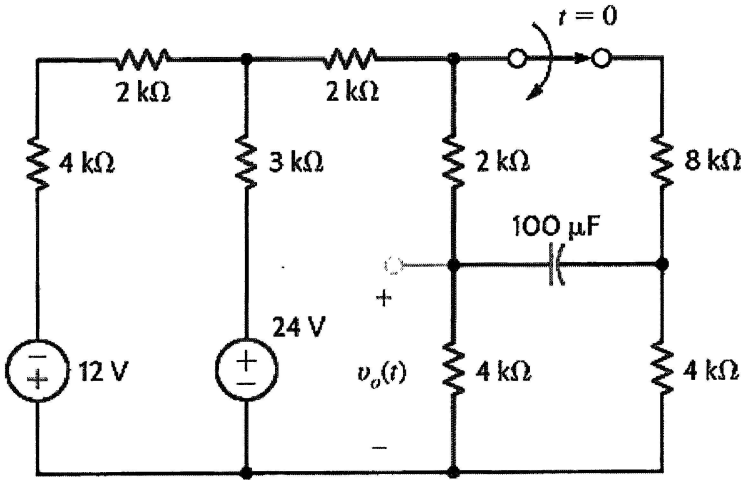

Fig. 2.

5. (15%) A second-order circuit in Fig. 3 is assumed to be in a steady-state condition prior to switch at $t = 0$. Please use Laplace transforms to the voltage $v_o(t)$ for $t > 0$.

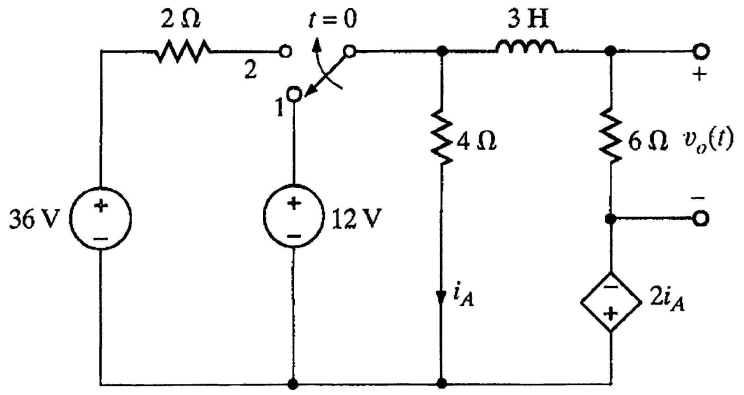

Fig. 3

6. (10%) The magnitude characteristic of a band-elimination filter is depicted in Fig. 4. Please determine the transfer function of $H(j\omega)$.

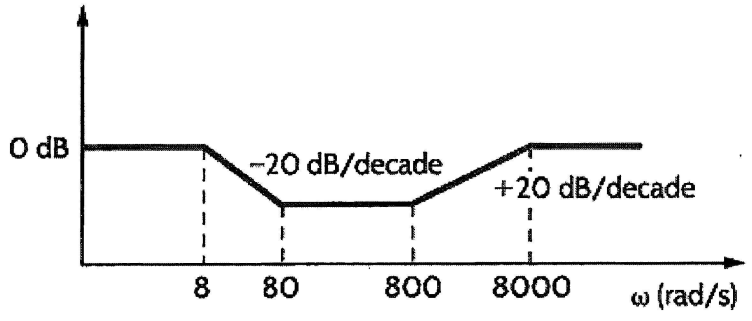

Fig. 4

7. (15%) Please sketch the magnitude characteristic of the Bode plot for the following transfer function.

$$\mathbf{H}_{(j\omega)} = \frac{5(j\omega + 10)}{j\omega(j\omega + 100)}$$

8. (15%) The switch in Fig. 5 has been closed for a long time and is opened at $t = 0$. Please find $i_{(90m)}$. 不完整就放棄，留著幹嘛

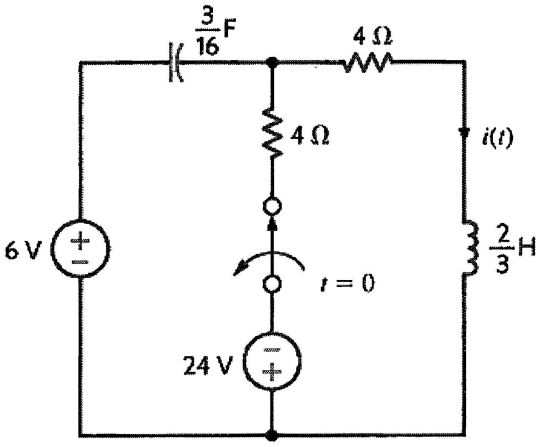

Fig. 5