

Electrical Science-II (15B11EC211)

Tutorial-2

1. Determine the forced response for the inductor current i when

- $i_s = 1\text{A}$
- $i_s = 0.5t\text{ A}$
- $i_s = 2e^{-250t}\text{ A}$,

For the circuit shown in fig.1, $R=100/65\ \Omega$, $C=1\text{mF}$ & $L=10\text{mH}$.

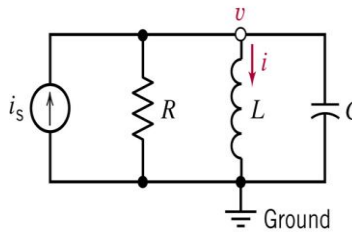


Fig.1

Ans: 1 A , $5t-3.25 \times 10^{-3}\text{ A}$, & $0.0133te^{-250t}\text{ A}$

2. Find $v(t)$ for $t > 0$, for circuit shown in fig.2.

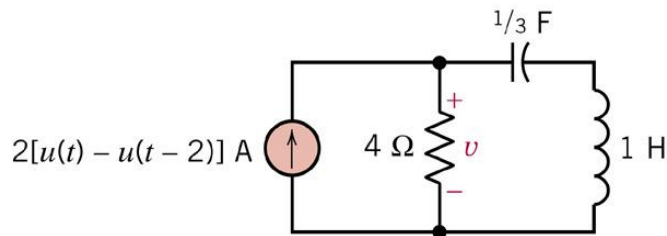


Fig.2

Ans: $v(t) = [8-16e^{-t}+16e^{-3t}]u(t) + [-8+16e^{-(t-2)}-16e^{-3(t-2)}]u(t-2)\text{ Volt}$

3. Find $v(t)$ for $t > 0$, for circuit shown in fig.3, when $v(0)=1\text{volt}$ & $i_L(0)=0$.

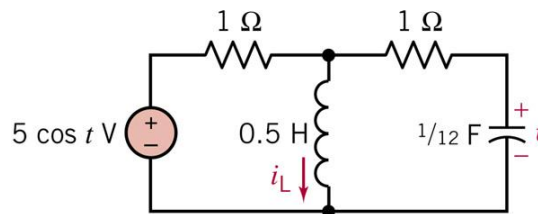


Fig.3

Ans: $v(t) = 25e^{-3t} - \frac{429e^{-4t} - 21\cos t + 33\sin t}{17}\text{ volt}$

4. Find $V_C(t)$ for $t > 0$, for circuit shown in fig.4.

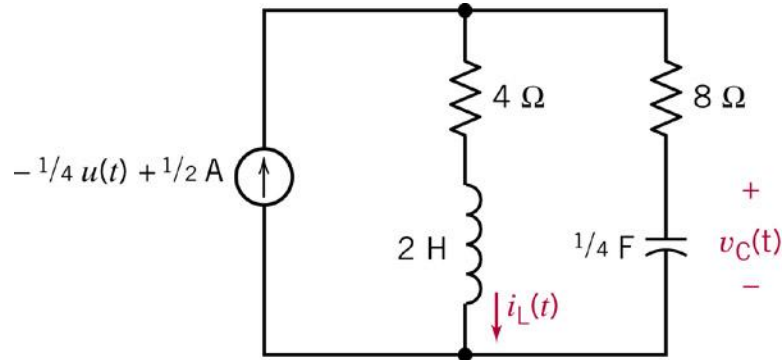


Fig.4

Ans: $v(t) = 0.123e^{-5.65t} + 0.877e^{-0.35t} + 1$ volt

5. In fig.5 determine the inductor current $i(t)$ when $i_s = 5u(t)$ A. Assume that $i(0) = 0$ & $v_c(0) = 0$.

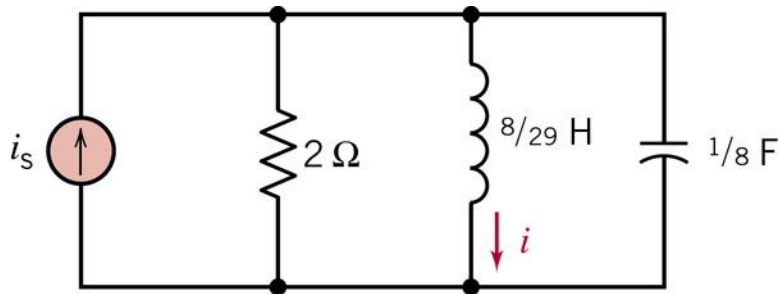


Fig.5

Ans: $i(t) = 5 + e^{-2t}[-5 \cos 5t - 2 \sin 5t]$ A