

Homework 4

Due date: Apr. 9th, 2018

Turn in your homework in class

Rules:

- Work on your own. Discussion is permissible, but extremely similar submissions will be judged as plagiarism.
- Please show all intermediate steps: a correct solution without an explanation will get zero credit.
- Please submit on time. No late submission will be accepted.
- Please prepare your submission in English only. No Chinese submission will be accepted.

1. The current in a $150\mu H$ inductor is known to be:

$$i_L = 25te^{-500t} \text{ A for } t \geq 0$$

- (a) Find the voltage across the inductor for $t > 0$.
- (b) Find the power (in microwatts) at the terminals of the inductor when $t = 5ms$.

2. Assume that the initial energy stored in the inductors of Fig. 1 is zero. Find the equivalent inductance with respect to the terminals a, b.

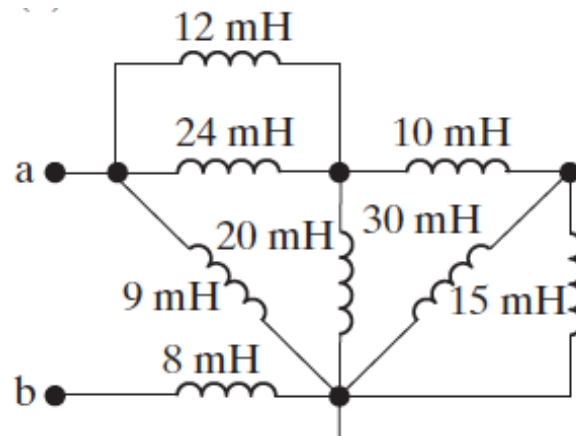


Fig. 1

3. The capacitance and associated voltage for each capacitor is given in Fig. 2. Find the equivalent capacitance and the associated voltage with respect to the terminals a, b for the circuit shown in Fig. 2.

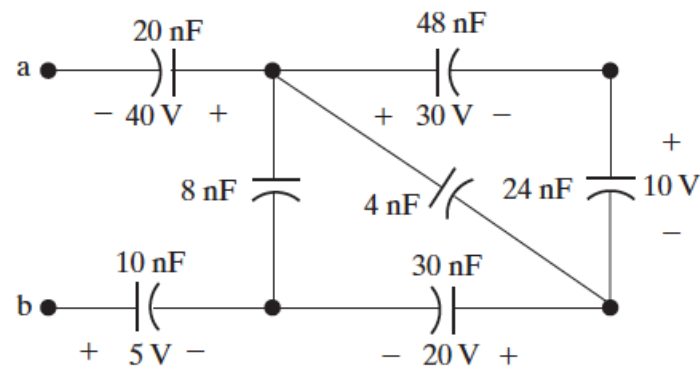


Fig. 2

4. The switch in the circuit in Fig. 3 has been open for a long time. At $t = 0$ the switch is closed.
- (a) Determine $i_o(0)$ and $i_o(\infty)$.
- (b) Determine $i_o(t)$ for $t \geq 0$.

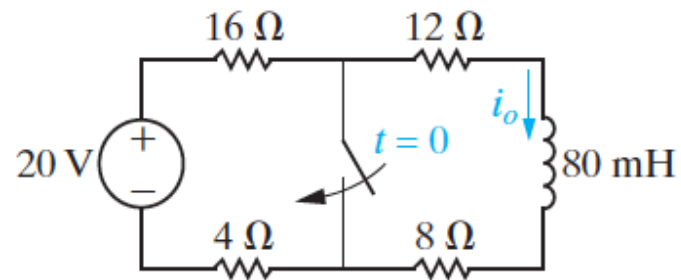


Fig. 3

5. The switch shown in Fig. 4 has been open for a long time before closing at $t = 0$. Write the expression for the capacitor voltage, $v(t)$, for $t \geq 0$.

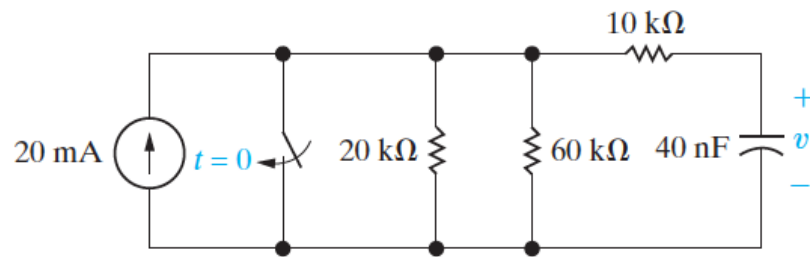


Fig. 4