Homework 10

Due date: Jun.13th, 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. (20%)Find the Laplace transform of each of the following functions:
   (a). $f(t) = 20e^{-500(t-10)}u(t-10)$.
   (b). $f(t) = (5t+20)[u(t+4)-u(t+2)] - 5t[u(t+2)-u(t-2)] - 10u(t-2)$.

2. (20%)Find $f(t)$ for each of the following functions:
   (a). $F(s) = \frac{6(s+10)}{(s+5)(s+8)}$
   (b). $F(s) = \frac{320}{s^2(s+8)}$
   (c). $F(s) = \frac{8(s+1)^2}{(s^2+10s+34)(s^2+8s+20)}$
   (d). $F(s) = \frac{25(s+4)^2}{s^2(s+5)^2}$

3. (20%)Find V_0(s domain) and v_0(time domain) in the circuit shown in Fig.1 if the initial energy is zero and the switch is closed at $t = 0$.

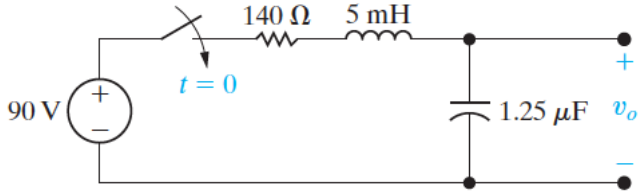

Fig.1

4. The switch in the circuit in Fig.2 has been closed for a long time. At $t = 0$ the switch is opened.
   (a). Find i_0 for $t \geq 0$.
   (b). Find v_0 for $t \geq 0$.

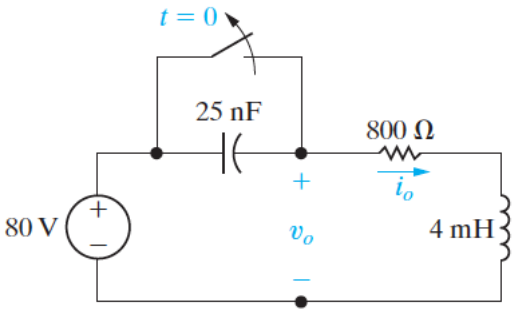

Fig.2

5. The switch in the circuit in Fig.3 has been closed for a long time before opening at $t = 0$. Find v_0 for $t \geq 0$.

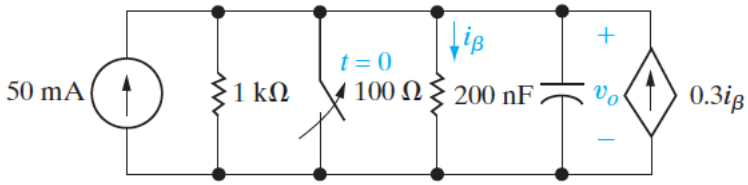

Fig.3