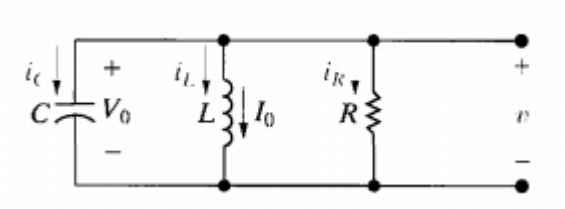
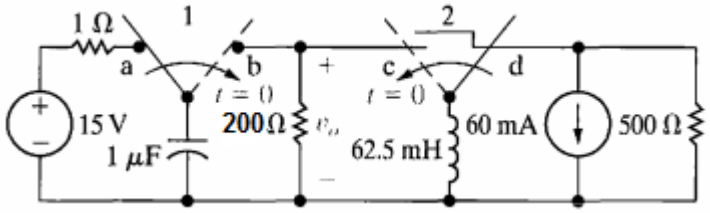
Q1: The natural voltage response of the circuit in Fig.Q1 is



$$v(t) = 75e^{-8000t}(\cos 6000t - 4\sin 6000t)\text{V}, \quad t \geq 0,$$

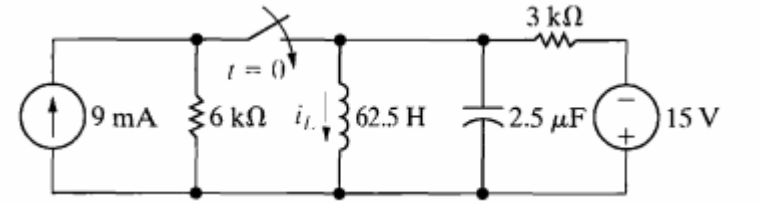
When the inductor is 400mH.Find (a)C; (b)R; (c)V_0 ; (d)I_0 ; and(e)$I_{L(t)}$.

Q2: The two switches in the circuit seen in Fig.Q2 operate synchronously. When switch1 is in position a, switch 2 is in position d. When switch 1 moves to position b, switch 2 moves to position c. Switch 1 has been in position a for a long time. At t=0,the switches move to their alternate positions. Find $v_{0(t)}$ for t>0.

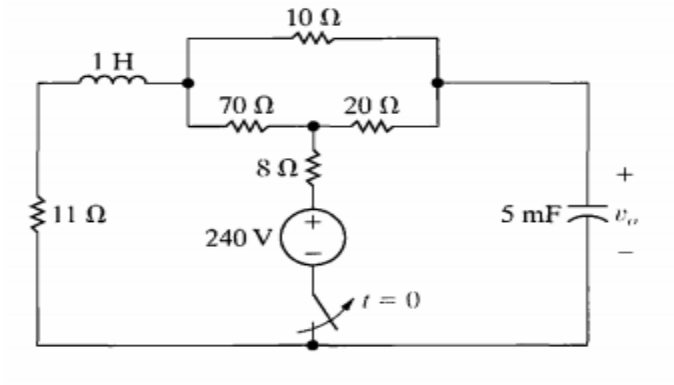


Q3: The resistor in the circuit of Fig.Q2 is decreased from 200 Ω to125 Ω.Find $v_{0(t)}$ for t>0.

Q4: The switch in the circuit in Fig. Q4 has been Open a long time before closing at t=0 find $i_{l(t)}$ for t≥0.



Q5: The switch in the circuit shown in Fig.Q5 has been closed for a long time. The switch opens at t=0. Find $v_o(t)$ for t>0.

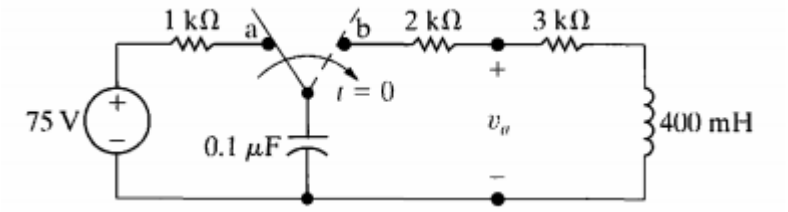


Q6: The switch in the circuit in Fig.Q6 has been in position a for a long time. At t=0, the switch moves instantaneously to position b.

a) What is the initial value of v_a?

b) What is the initial value of dv_a/dt ?

c) What is the numerical expression for $v_a(t)$ for t>0?

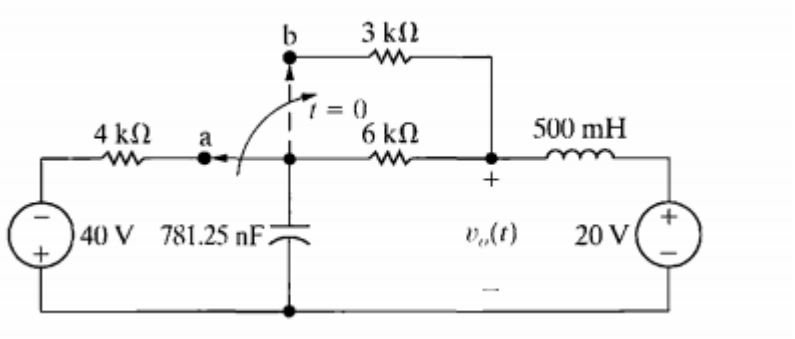


Q7: The switch in the circuit of Fig.Q7 has been in position a for a long time. At t=0 the switch moves instantaneously to position b .Find

a) v_o (0^+)

b) $dv_0(0^+)/dt$

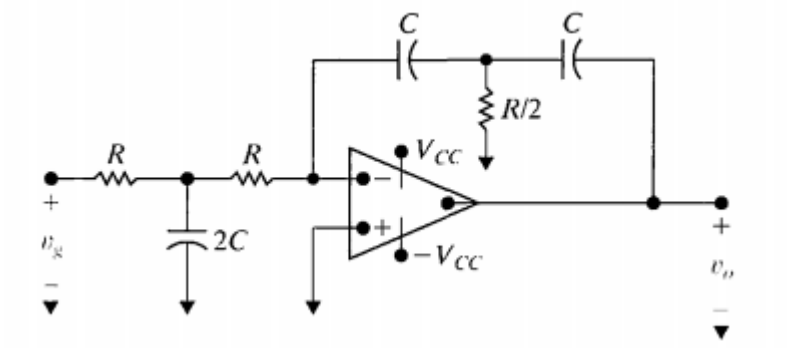
c)$v_0(t)$for $t \geq 0$.



Q8: a) Derive the differential equation that relates The output voltage to the input voltage for the circuit shown in Fig.Q8.

b) Compare the result with Eq.8.75 when $R_1C_1=R_2C_2=RC$ in Fig.8.18.

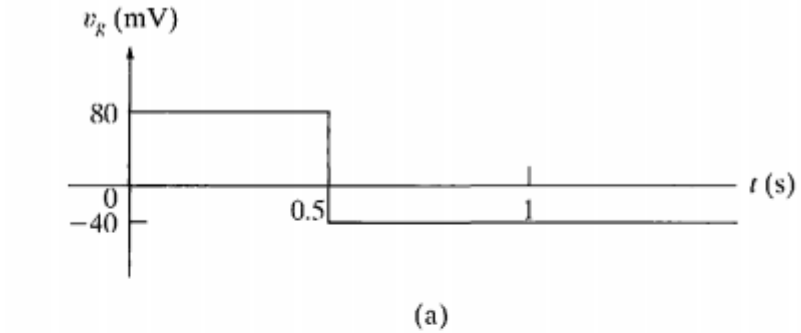
c) What is the advantage of the circuit shown in Fig.Q8?



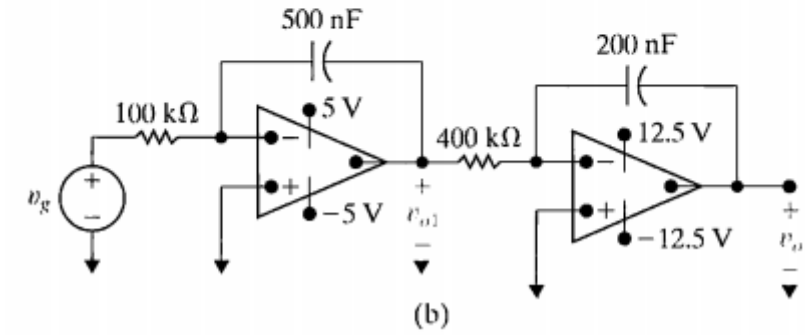
Q9: The voltage signal of Fig.Q9 (a) is applied to cascaded integrating amplifiers shown in Fig.Q9(b).There is no energy stored in the capacitors at the instant the signal is applied.

a) Derive the numerical expressions for $v_o(t)$ and v_{o1} (t) for the time intervals $0<t<0.5$ s and $0.5 s<t<t_{sat}$.

b) Compute the value of t_{sat}.



(a)



(b)