Salahaddin University-Erbil

College of Engineering

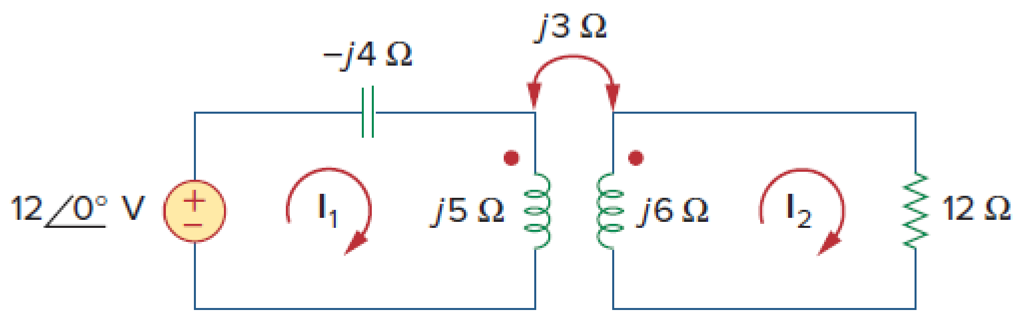
Electrical Engineering Department

Network Analysis II

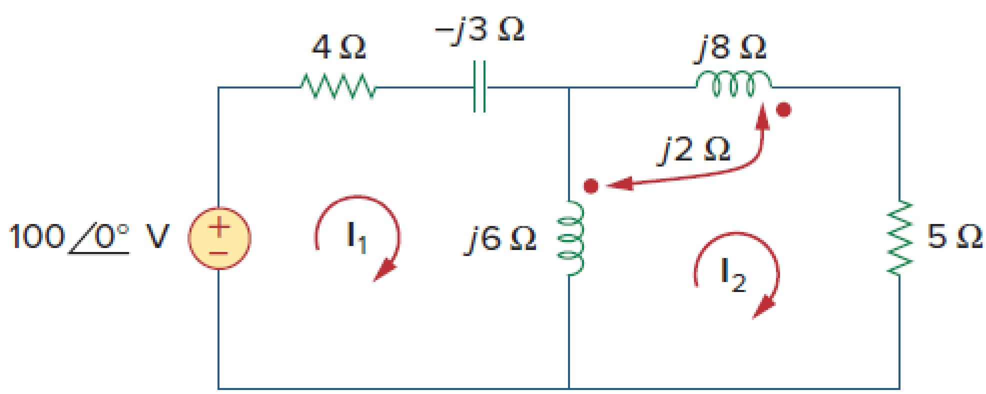
Question Bank

By: Azad N. Abdulla

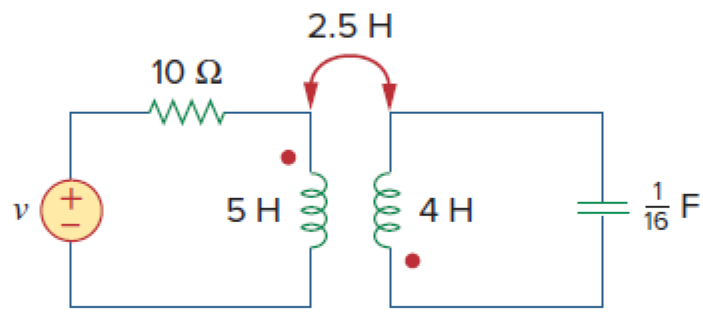
Q1) Calculate the phasor currents $\mathbf{I}_1$ and $\mathbf{I}_2$ in the circuit shown in figure below.



Q2) Calculate the mesh currents in the circuit shown in figure below.



Q3) Consider the circuit shown in figure below. Determine the coupling coefficient. Calculate the energy stored in the coupled inductors at time t **= 1s** if
v **= 60 cos (4t + 30°) V**.

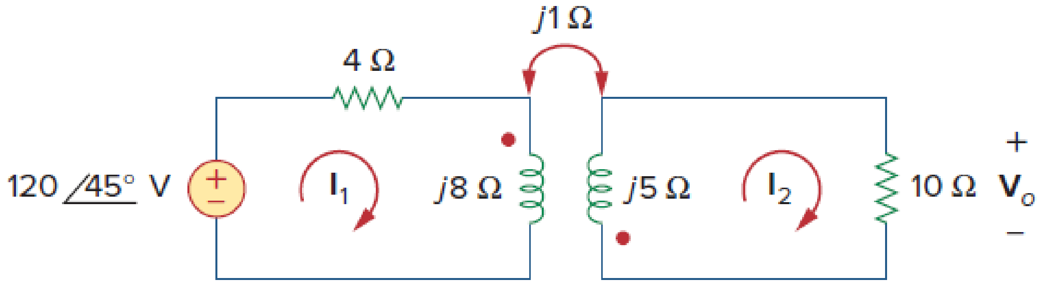


Q4) Two coils are connected in series and their effective inductance is found to be **15 mH**. When the connection to one coil is reversed, the effective inductance is found to be **10 mH**. If the coefficient of coupling is **0.7**, determine:

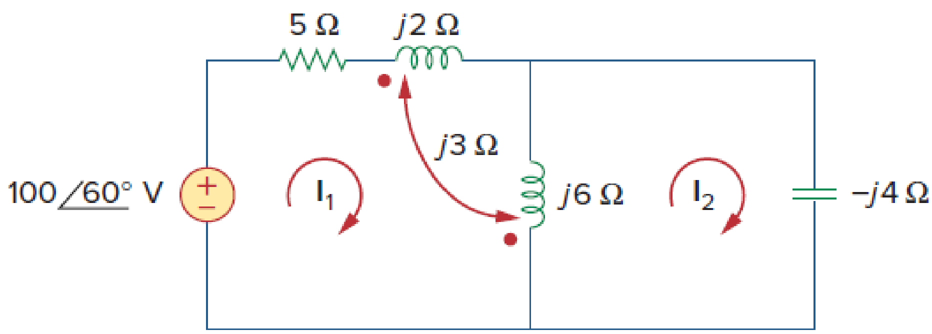
(a) The self inductance of each coil

(b) The mutual inductance.

Q5) Determine the voltage $\mathbf{V_O}$ in the circuit shown in figure below.



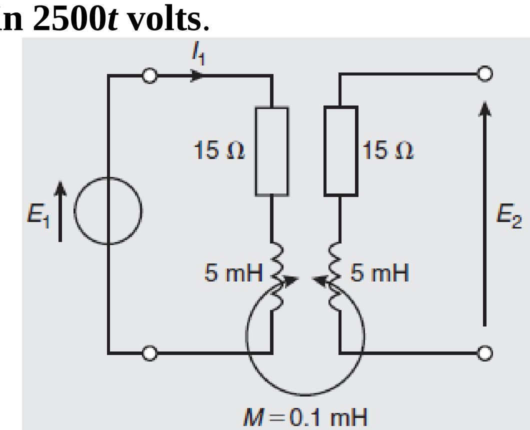
Q6) Determine the phasor currents $\mathbf{I}_1$ and $\mathbf{I}_2$ in the circuit shown in figure below.



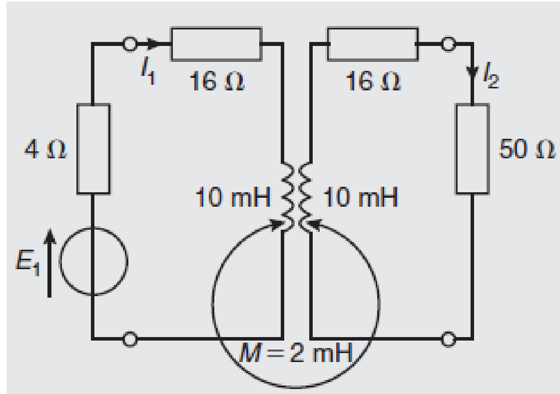
Q7) Two coils connected in series have self inductance of **40 mH** and **10 mH**, respectively. The total inductance of the circuit is found to be **60 mH**. Determine:
(a) The mutual inductance between the two coils
(b) The coefficient of coupling.

Q8) Two mutually coupled coils, **X** and **Y**, are connected in series to a **240 V DC**. supply. Coil **X** has a resistance of **5Ω** and an inductance of **1H**. Coil **Y** has a resistance of **10Ω** and an inductance of **5 H**. At a certain instant after the circuit is connected, the current is 8 A and increasing at a rate of **15 A/s**. Determine:
(a) The mutual inductance between the coils (b) The coefficient of coupling.

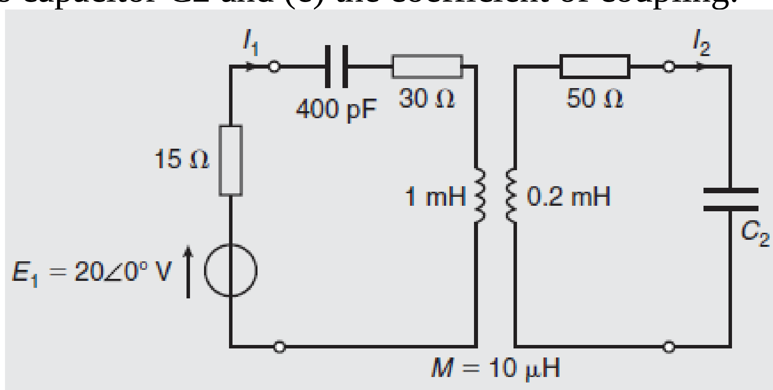
Q9) For the circuit shown in figure below, determine the $\boldsymbol{E_2}$ which appears across the open-circuited secondary winding, given that $\boldsymbol{E_1}$ **= 8sin 2500*t* volts**.



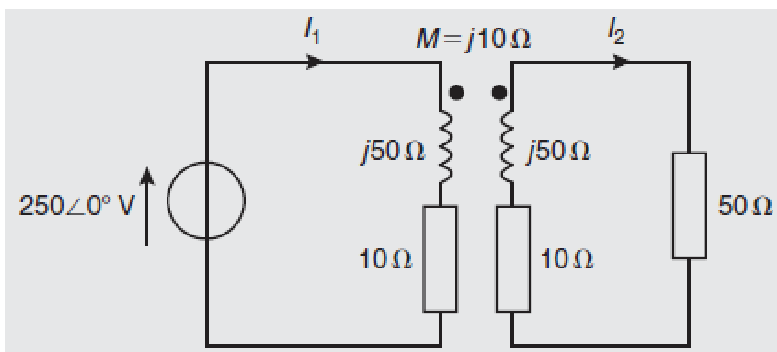
Q10) For the circuit shown in figure below, determine the value of the secondary current I_2 if $E1 = 2\angle 0^{\circ}$ volts and the frequency is $10^{3}/\pi$ **Hz**.



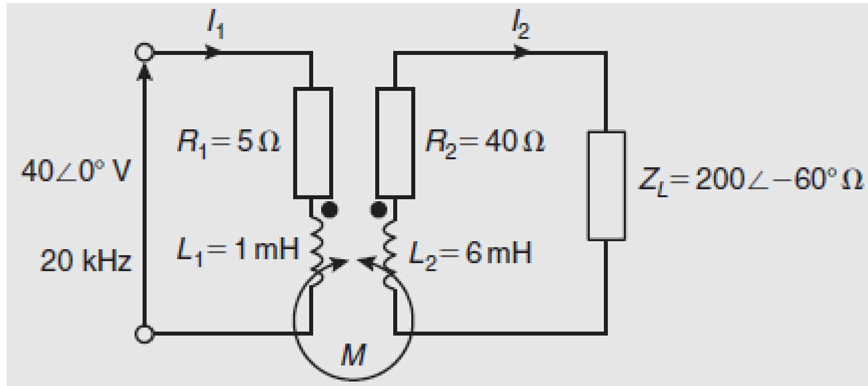
Q11) For the circuit shown in figure below each winding is tuned to resonate at the same frequency. Determine (a) the resonant frequency, (b) the value of capacitor *C*2, (c) the primary current, (d) the voltage across capacitor C2 and (e) the coefficient of coupling.



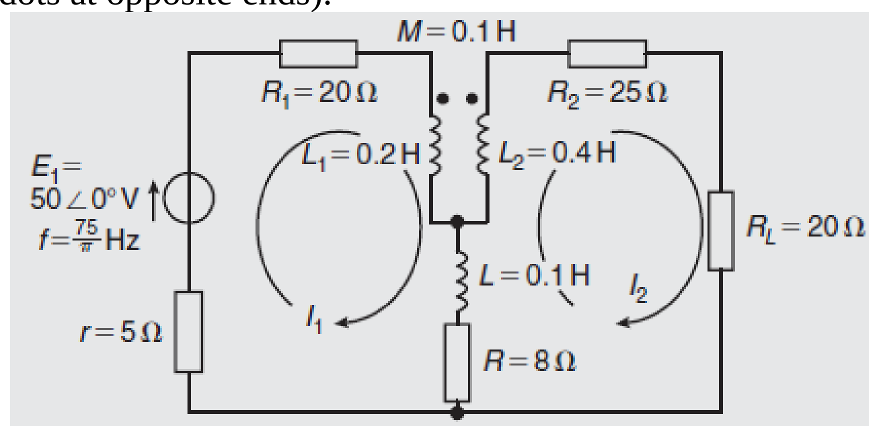
Q12) For the coupled circuit shown in figure below, determine the values of currents I_1 and I_2.



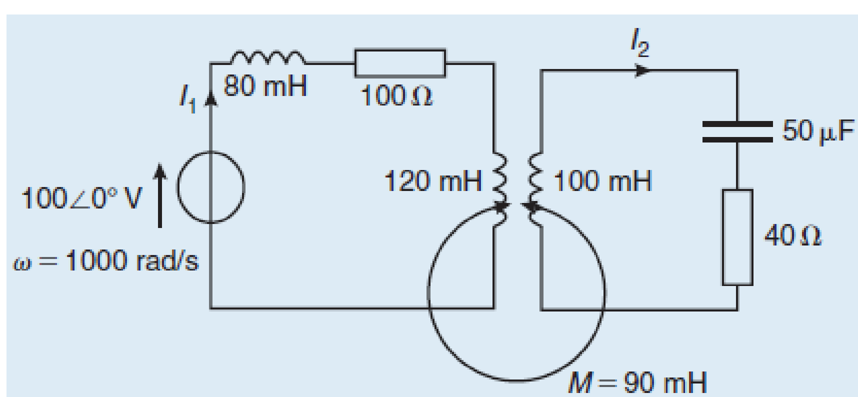
Q13) The circuit diagram of an air-cored transformer winding is shown in figure below. The coefficient of coupling between primary and secondary windings is **0.70**. Determine for the circuit (a) the mutual inductance $\boldsymbol{M}$, (b) the primary current $\boldsymbol{I_1}$ and (c) the secondary current $\boldsymbol{I_2}$.



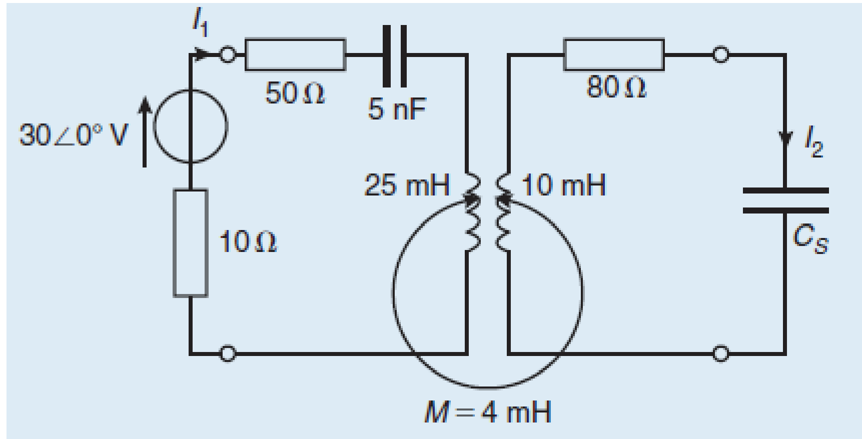
Q14) For the coupled circuit shown in figure below. Determine the source and load currents for (a) the windings as shown (i.e. with the dots adjacent), and (b) with one winding reversed (i.e. with the dots at opposite ends).



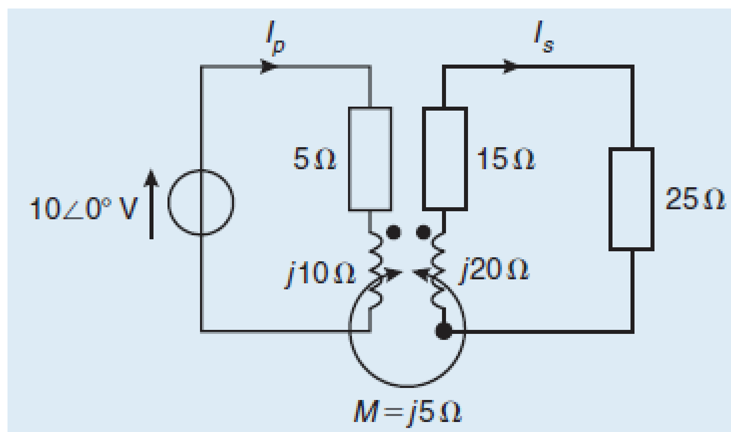
Q15) For the magnetically coupled circuit shown in figure below, determine (a) the self impedance of the primary circuit, (b) the self impedance of the secondary circuit, (c) the primary current and (d) the secondary current.



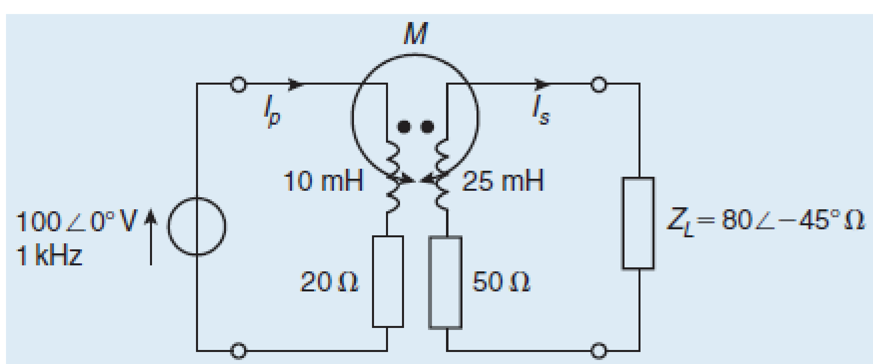
Q16) In the coupled circuit shown in figure below, each winding is tuned to resonance at the same frequency. Calculate (a) the resonant frequency, (b) the value of *CS*, (c) the primary current, (d) the secondary current, (e) the voltage across capacitor *CS* and (f) the coefficient of coupling.



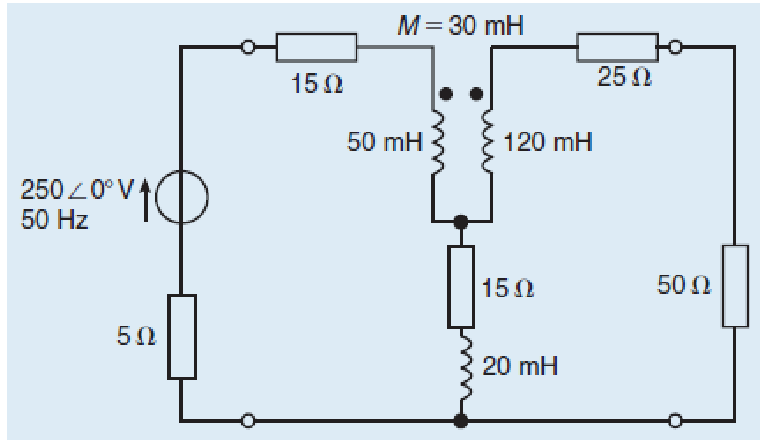
Q17) Determine the values of currents $\boldsymbol{I_p}$ and $\boldsymbol{I_s}$ in the coupled circuit shown in figure below.



Q18) The **coefficient of coupling** between the primary and secondary windings for the air-cored transformer shown in figure below is 0.84. Calculate for the circuit (a) the mutual inductance $\boldsymbol{M}$, (b) the primary current $\boldsymbol{I_p}$ and (c) the secondary current $\boldsymbol{I_s}$.



Q19) For the magnetically coupled circuit shown in figure below. Determine (a) the source current and (b) the load current. (c) If one of the windings is reversed, determine the new value of source and load currents.



Q20) An ideal transformer is rated at **2400/120 V, 9.6 kVA**, and has **50 turns** on the secondary side. Calculate: (a) the turns ratio, (b) the number of turns on the primary side, and (c) the current ratings for the primary and secondary windings.

Q21) A complex voltage wave is given by: $\boldsymbol{v=200 \sin 100\pi t + 80 \sin 300\pi t + 40 \sin 500\pi t}$ **volts** Determine (a) which harmonics are present, (b) the **r.m.s.** value of the fundamental, (c) the frequency of the fundamental, (d) the periodic time of the fundamental, (e) the frequencies of the harmonics, (f) the percentage third harmonic and (g) the percentage fifth harmonic.

Q22) A complex voltage waveform which has an r.m.s. value of 240 V contains 30% third harmonic and 10% fifth harmonic, both of the harmonics being initially in phase with each other. (a) Determine the r.m.s. value of the fundamental and each harmonic. (b) Write down an expression to represent the complex voltage waveform if the frequency of the fundamental is 31.83 Hz.

Q23) A complex voltage ***v*** given by

$$v = 60 \sin \omega t + 15 \sin\left(3\omega t + \frac{\pi}{4}\right) + 10 \sin\left(5\omega t - \frac{\pi}{2}\right) \text{ volts}$$

is applied to a circuit and the resulting current ***i*** is given by

$$i = 2 \sin\left(\omega t - \frac{\pi}{6}\right) + 0.3 \sin\left(3\omega t - \frac{\pi}{12}\right) + 0.1 \sin\left(5\omega t - \frac{8\pi}{9}\right) \text{ amperes}$$

Determine (a) the total active power supplied to the circuit and (b) the overall power factor.

Q24) A complex voltage waveform represented by

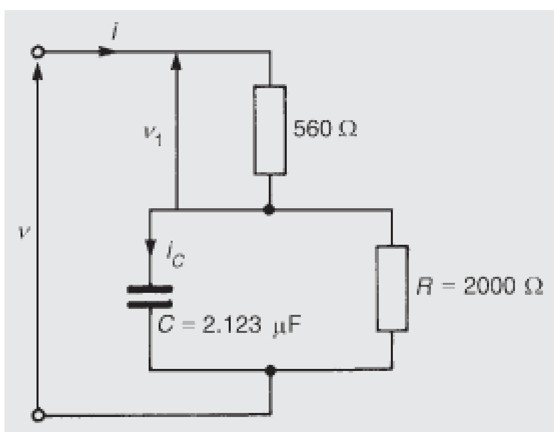
$$v = 100\sin\omega t + 30\sin\left(3\omega t + \frac{\pi}{3}\right) + 10\sin\left(5\omega t - \frac{\pi}{6}\right) \text{ volts}$$

is applied across (a) a pure **40Ω** resistance, (b) a pure **7.96 mH** inductance and (c) a pure **25µF** capacitor. Determine for each case an expression for the current flowing if the fundamental frequency is **1 kHz**.

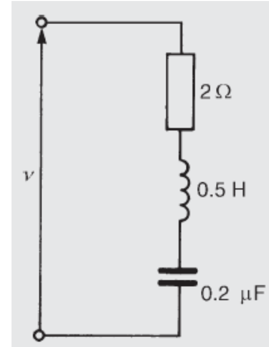
Q25) A supply voltage ***v*** given by ***v* = *(*240 sin314*t* +40 sin942*t* +30 sin1570*t)*** volts is applied to a circuit comprising a resistance of **12Ω** connected in series with a coil of inductance **9.55 mH**. Determine (a) an expression to represent the instantaneous value of the current, (b) the **r.m.s.** voltage, (c) the **r.m.s.** current, (d) the power dissipated and (e) the overall power factor.

Q26) The voltage applied to a particular circuit comprising two components connected in series is given by ***v* = *(*30+40 sin103*t* +25sin2×103*t* +15sin 4×103*t)*** volts and the resulting current is given by ***i* = 0.743sin *(*103*t* +1.190*)* +0.781sin *(*2×103*t* +0.896*)* +0.636sin *(*4×103*t* +0.559*)* A**, determine (a) the average power supplied, (b) the type of components present, and (c) the values of the components.

Q27) In the circuit shown in figure below, the supply voltage is given by ***v* = 300 sin314*t*+ 120 sin*(*942*t* +0.698*)*** volts. Determine (a) an expression for the supply current, ***i***, (b) the percentage harmonic content of the supply current, (c) the total power dissipated, (d) an expression for the p.d. shown as v_1 and (e) an expression for current i_C.



Q28) A voltage waveform having a fundamental of maximum value **400 V** and a third harmonic of maximum value **10 V** is applied to the circuit shown in figure below. Determine (a) the fundamental frequency for resonance with the third harmonic, and (b) the maximum value of the fundamental and third harmonic components of current.



Q29) A voltage wave has amplitude of **800 V** at the fundamental frequency of **50 Hz** and its ***n*th** harmonic has amplitude **1.5%** of the fundamental. The voltage is applied to a series circuit containing resistance **5Ω**, inductance **0.369 H** and capacitance **0.122μF**. Resonance occurs at the ***n*th** harmonic. Determine (a) the value of ***n***, (b) the maximum value of current at the ***n*th** harmonic, (c) the p.d. across the capacitor at the ***n*th** harmonic and (d) the maximum value of the fundamental current.

Q30) An **e.m.f.** is represented by

$$e = 50 + 200\sin\omega t + 40\sin\left(2\omega t - \frac{\pi}{2}\right) + 5\sin\left(4\omega t + \frac{\pi}{4}\right) \text{ volts,}$$

the fundamental frequency being **50 Hz**. The e.m.f. is applied across a circuit comprising a **100μF** capacitor connected in series with a **50Ω** resistor. Obtain an expression for the current flowing and hence determine the **r.m.s. value** of current.

Q31) A complex voltage, ***v***, given by ***v* = 200 sin*ωt* +42 sin3*ωt* +25sin5*ωt* volts** is applied to a circuit comprising a **6Ω** resistance in series with a coil of inductance **5 mH**. Determine, for a fundamental frequency of **50 Hz**, (a) an expression to represent the instantaneous value of the current flowing, (b) the **r.m.s.** voltage, (c) the **r.m.s.** current, (d) the power dissipated and (e) the overall power factor.

Q32) A complex current given by

$$i = 5\sin\left(\omega t + \frac{\pi}{3}\right) + 8\sin\left(3\omega t + \frac{2\pi}{3}\right) \text{ mA}$$

flows through a pure **2000 pF** capacitor. If the frequency of the fundamental component is **4 kHz**, determine (a) the **r.m.s. value** of current, (b) an expression for the p.d. across the capacitor and (c) the **r.m.s. value** of voltage.

Q33) An **e.m.f.** ***e*** is given by

$$e = 40 + 150 \sin \omega t + 30 \sin \left(2\omega t - \frac{\pi}{4}\right) + 10 \sin \left(4\omega t - \frac{\pi}{3}\right) \text{ volts}$$

the fundamental frequency being **50 Hz**. The **e.m.f.** is applied across a circuit comprising a **100Ω** resistance in series with a **15µF** capacitor. Determine (i) the **r.m.s. value** of voltage, (ii) an expression for the current flowing and (iii) the **r.m.s. value** of current.

Q34) A coil having inductance ***L*** and resistance ***R*** is supplied with a complex voltage given by

$$v = 240 \sin \omega t + V_3 \sin \left(3\omega t + \frac{\pi}{3}\right) + V_5 \sin \left(5\omega t - \frac{\pi}{12}\right) \text{ volts}$$

The resulting current is given by

$$i = 4.064 \sin (\omega t - 0.561) + 0.750 \sin (3\omega t - 0.036) + 0.182 \sin (5\omega t - 1.525) \text{ A}$$

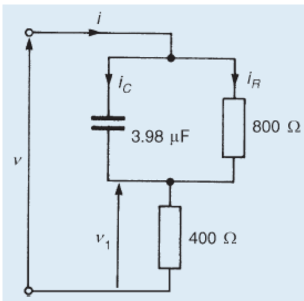
The fundamental frequency is **500 Hz**. Determine (a) the impedance of the circuit at the fundamental frequency, and hence the values of ***R*** and ***L***, (b) the values of V_3 and V_5, (c) the **r.m.s.** voltage, (d) the **r.m.s.** current,(e) the circuit power and (f) the power factor.

Q35) An alternating supply voltage represented by ***v* =(240 sin300*t* −40 sin1500*t*+ 60 sin2100*t*) volts** is applied to the terminals of a circuit containing a **40Ω** resistor, a **200 mH** inductor and a **25µF** capacitor in series. (a) Derive the expression for the current waveform and (b) calculate the power dissipated by the circuit.

Q36) A voltage ***v*** represented by

$$v = 120 \sin 314t + 25 \sin \left(942t + \frac{\pi}{6}\right) \text{ volts}$$

is applied to the circuit shown in figure below. Determine (a) an expression for current ***i***, (b) the percentage harmonic content of the supply current, (c) the total power dissipated, (d) an expression for the p.d. shown as v_1 and (e) expressions for the currents shown as I_r and i_C



Q37) A complex voltage of fundamental frequency **50 Hz** is applied to a series circuit comprising resistance **20Ω**, inductance **800µH** and capacitance **74.94µF**. Resonance occurs at the ***n*th** harmonic. Determine the value of ***n***.

Q38) A complex voltage waveform has a maximum value of **500 V** at the fundamental frequency of **60 Hz** and contains a **17th** harmonic having amplitude of **2%** of the fundamental. The voltage is applied to a series circuit containing resistance **2Ω**, inductance **732 mH** and capacitance **33.26 nF**. Determine (a) the maximum value of the **17th** harmonic current, (b) the maximum value of the **17th** harmonic p.d. across the capacitor and (c) the amplitude of the fundamental current.

Q39) A complex voltage waveform ***v*** is given by the expression

$$v = 150\sin\omega t + 25\sin\left(3\omega t - \frac{\pi}{6}\right) + 10\sin\left(5\omega t + \frac{\pi}{3}\right) \text{ volts}$$

where ***ω*** **= 314 rad/s**. The voltage is applied to a circuit consisting of a coil of resistance **10Ω** and inductance **50 mH** in series with a variable capacitor. (a) Calculate the value of the capacitance which will give resonance with the triple frequency component of the voltage. (b) Write down the corresponding equation for the current waveform. (c) Determine the **r.m.s. value** of current. (d) Find the power dissipated in the circuit.

Q40) A **20µF** capacitor is connected in series with a **50 kΩ** resistor and the circuit is connected to a **20 V DC.** supply. Determine (a) The initial value of the current flowing, (b) The time constant of the circuit, (c) The value of the current one second after connection, (d) The value of the capacitor voltage two seconds after connection and (e) The time after connection when the resistor voltage is **15 V**

Q41) A circuit consists of a resistor connected in series with a **0.5µF** capacitor and has a time constant of **12 ms**. Determine (a) the value of the resistor, and (b) the capacitor voltage **7 ms** after connecting the circuit to a **10 V** supply.

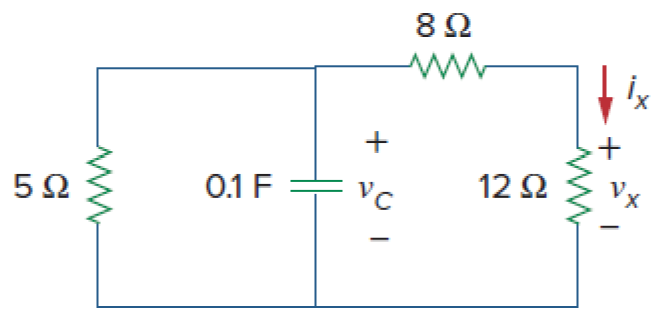
Q42) A circuit consists of a **10µF** capacitor connected in series with a **25 kΩ** resistor with a switchable **100 V DC**. supply. When the supply is connected, calculate (a) the time constant, (b) The maximum current, (c) The voltage across the capacitor after **0.5 s**, (d) The current flowing after one time constant, (e) The voltage across the resistor after **0.1 s**, (f) The time for the capacitor voltage to reach **45 V** and (g) The initial rate of voltage rise.

Q43) A capacitor is charged to **100 V** and then discharged through a **50 kΩ** resistor. If the time constant of the circuit is **0.8 s**, determine: (a) The value of the capacitor, (b) The time for the capacitor voltage to fall to **20 V**, (c) The current flowing when the capacitor has been discharging for **0.5 s**, and (d) The voltage drop across the resistor when the capacitor has been discharging for one second.

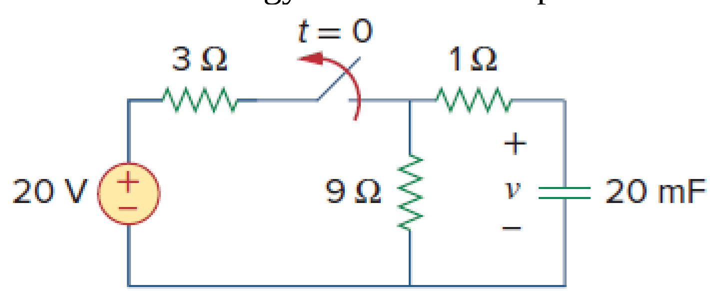
Q44) A **0.1μF** capacitor is charged to **200 V** before being connected across a **4 kΩ** resistor. Determine (a) The initial discharge current, (b) The time constant of the circuit and (c) The minimum time required for the voltage across the capacitor to fall to less than **2V**.

Q45) A DC. voltage supply of **200 V** is connected across a **5μF** capacitor as shown in figure below. When the supply is suddenly cut by opening switch **S**, the capacitor is left isolated except for a parallel resistor of **2 MΩ** Calculate the p.d. across the capacitor after **20 s**.

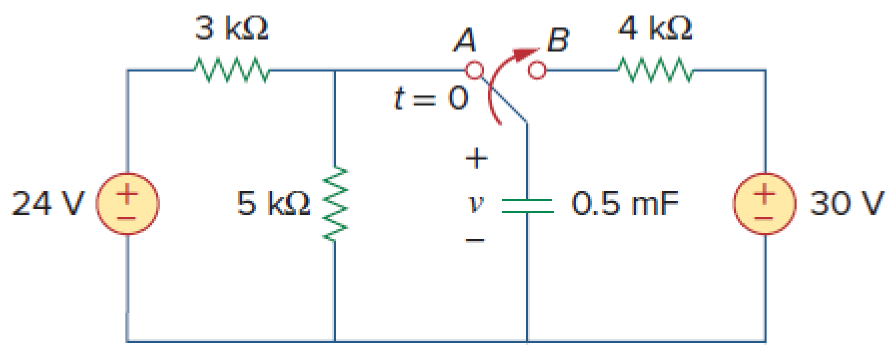
Q46) In figure below, let $\mathbf{v_C(0) = 15\ V}$. Find $\mathbf{v_C}$, $\mathbf{v_x}$, and $\mathbf{i_x}$ for $\mathbf{t > 0}$.



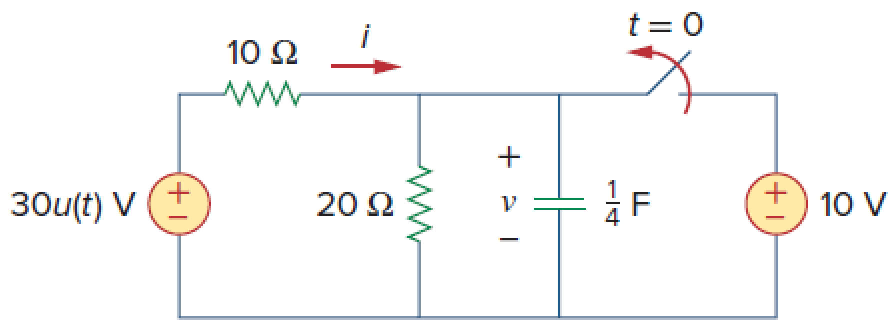
Q47) The switch in the circuit in figure below has been closed for a long time, and it is opened at $t = 0$. Find $v(t)$ for $t \geq 0$. Calculate the initial energy stored in the capacitor.



Q48) The switch in figure below has been in position ***A*** for a long time. At $t = 0$, the switch moves to ***B***. Determine $v(t)$ for $t > 0$ and calculate its value at $t = 1$ and 4 s.



Q49) In figure below, the switch has been closed for a long time and is opened at $t = 0$. Find i and v for all time.



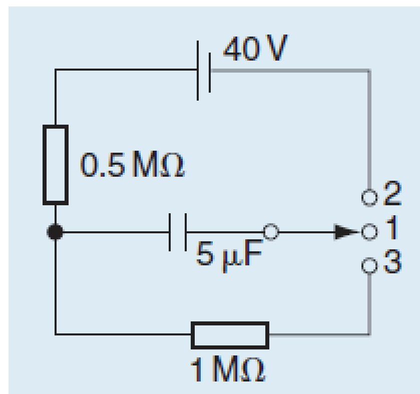
Q50) A **50µF** uncharged capacitor is connected in series with a **1 kΩ** resistor and the circuit is switched to a **100 V DC** supply. Determine: (a) the initial current flowing in the circuit, (b) the time constant, (c) the value of current when ***t*** is **50 ms** and (d) the voltage across the resistor **60 ms** after closing the switch.

Q51) A **60µF** capacitor is connected in series with a **10 kΩ** resistor and connected to a **120 V DC** supply. Calculate (a) the time constant, (b) the initial rate of voltage rise, (c) the initial charging current and (d) the time for the capacitor voltage to reach **50 V**.

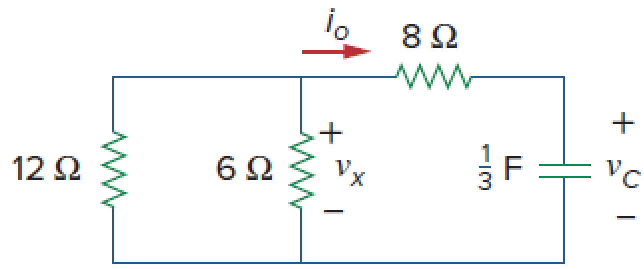
Q52) A **200 V DC** supply is connected to a **2.5 MΩ** resistor and a **2µF** capacitor in series. Calculate (a) the current flowing **4 s** after connecting, (b) the voltage across the resistor after **4 s** and (c) the energy stored in the capacitor after **4 s**.

Q53) 1) In the circuit shown in figure below, with the switch in position **1**, the capacitor is uncharged. If the switch is moved to position **2** at time ***t*=0 s**, calculate (i) the initial current through the **0.5 MΩ**, (ii) the voltage across the capacitor when ***t*=1.5 s** and (iii) the time taken for the voltage across the capacitor to reach **12 V**.

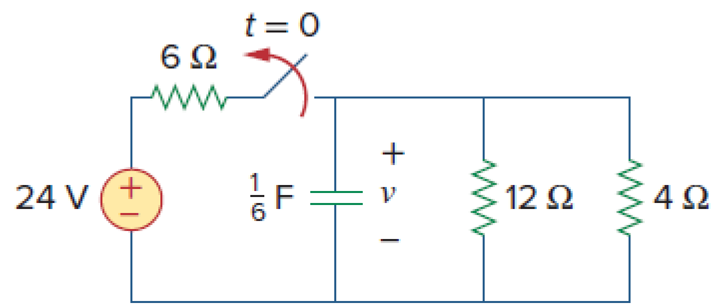
Q54) If at the time ***t* =1.5** s, the switch is moved to position **3**, calculate (i) the initial current through the **1 MΩ** resistor, (ii) the energy stored in the capacitor **3.5 s** later (i.e. when ***t*** =5 s).



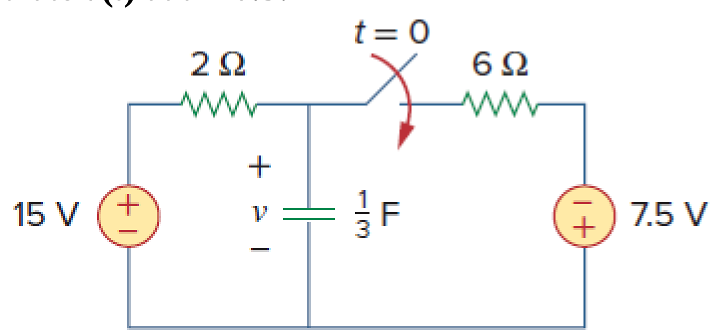
Q54) For the circuit in figure below. Let v_C **(0) = 60 V**. Determine v_C, v_x, and i_o **for $t \geq 0$**.



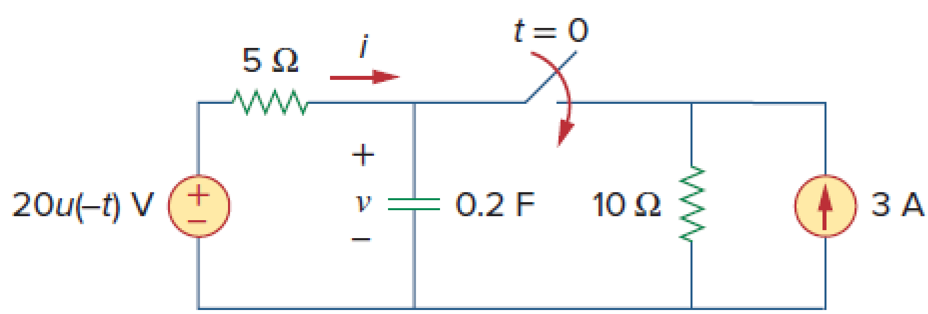
Q55) If the switch in Figure below opens at $t = 0$, find $v(t)$ for $t \geq 0$ and $w_C(0)$.



Q56) Find $v(t)$ for $t > 0$ in the circuit of Figure below. Assume the switch has been open for a long time and is closed at $t = 0$. Calculate $v(t)$ at $t = 0.5$.



Q57) The switch in figure below is closed at $t = 0$. Find $i(t)$ and $v(t)$ for all time. Note that $u(-t) = 1$ for $t < 0$ and 0 for $t > 0$. Also, $u(-t) = 1 - u(t)$.



Q58) A coil of inductance **0.04H** and resistance **10Ω** is connected to a **120V DC** supply. Determine (a) the final value of current, (b) the time constant of the circuit, (c) the value of current after a time equal to the time constant from the instant the supply voltage is connected, and (d) the expected time for the current to rise to within **1%** of its final value.

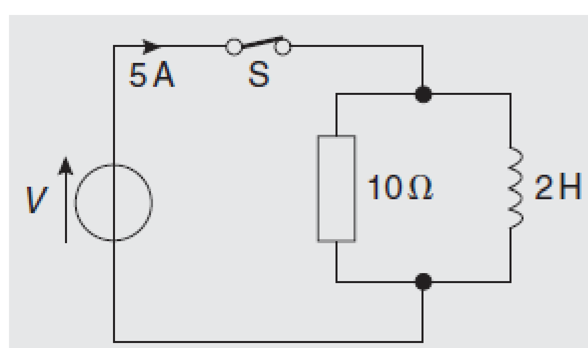
Q59) The winding of an electromagnet has an inductance of **3H** and a resistance of **15Ω**. When it is connected to a **120V DC** supply, calculate: (a) the steady state value of current flowing in the winding, (b) the time constant of the circuit, (c) the value of the induced **e.m.f.** after **0.1s**, (d) the time for the current to rise to **85%** of its final value and (e) the value of the current after **0.3s**

Q60) A coil having an inductance of **6H** and a resistance of **RΩ** is connected in series with a resistor of **10Ω** to a **120V DC** supply. The time constant of the circuit is **300ms**. When steady state conditions have been reached, the supply is replaced instantaneously by a short-circuit. Determine: (a) the resistance of the coil, (b) the current flowing in the circuit one second after the shorting link has been placed in the circuit and (c) the time taken for the current to fall to **10%** of its initial value.

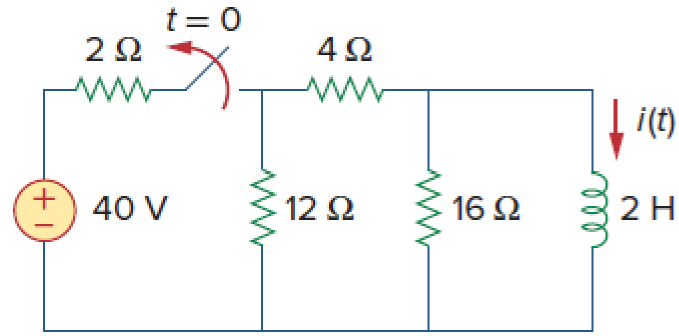
Q61) An inductor has a negligible resistance and an inductance of **200mH** and is connected in series with a **1kΩ** resistor to a **24V DC** supply. Determine the time constant of the circuit and the steady state value of the current flowing in the circuit. Find (a) the current flowing in the circuit at a time equal to one time constant, (b) the voltage drop across the inductor at a time equal to two time constants and (c) the voltage drop across the resistor after a time equal to three time constants.

Q62) A coil of inductance **50 mH** and resistance **5Ω** is connected to a **110 V DC** supply. Determine (a) the final value of current, (b) the value of current after **4ms**, (c) the value of the voltage across the resistor after **6ms**, (d) the value of the voltage across the inductance after **6ms** and (e) the time when the current reaches **15A**.

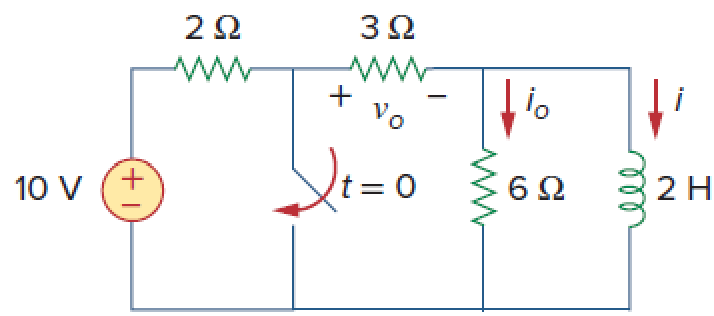
Q63) In the circuit shown in figure below, a current of **5A** flows from the supply source. Switch **S** is then opened. Determine (a) the time for the current in the **2H** inductor to fall to **200mA** and (b) the maximum voltage appearing across the resistor.



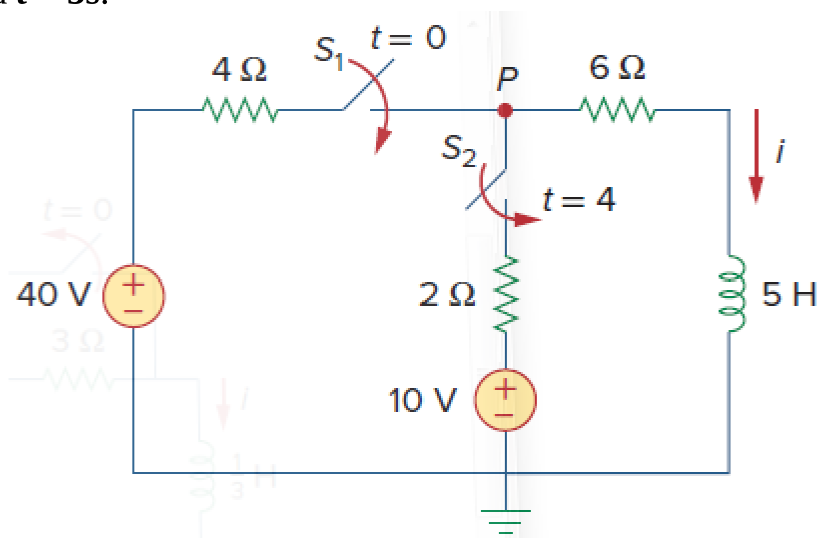
Q64) The switch in the circuit of figure below has been closed for a long time. At $t = 0$, the switch is opened. Calculate $i(t)$ for $t > 0$.



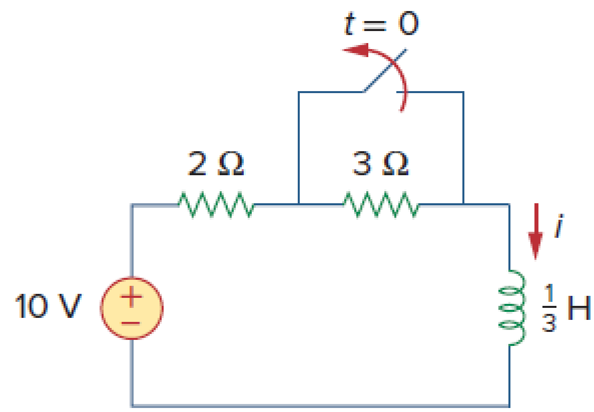
Q65) In the circuit shown in figure below, find i_o, v_o, and i for all time, assuming that the switch was open for a long time.



Q66) At $t = 0$, switch 1 in figure below is closed, and switch **2** is closed 4s later. Find $i(t)$ for $t > 0$. Calculate i for $t = 2s$ and $t = 5s$.

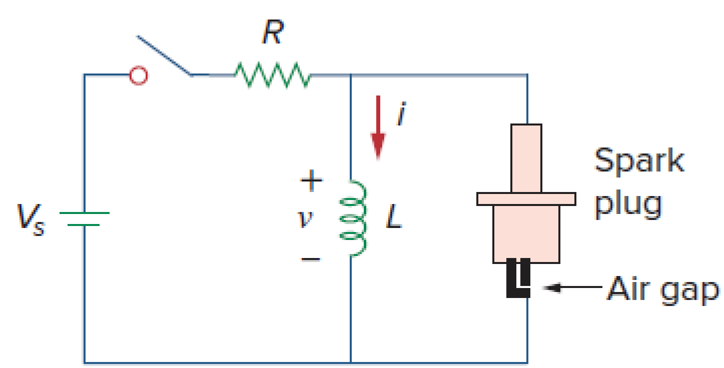


Q67) Find ***i*(*t*)** in the circuit of figure below for ***t* > 0**. Assume that the switch has been closed for a long time.



Q68) The coil of a certain relay is operated by a **12V** battery. If the coil has a resistance of **150 Ω** and an inductance of **30 mH** and the current needed to pull in is **50mA**, calculate the relay delay time.

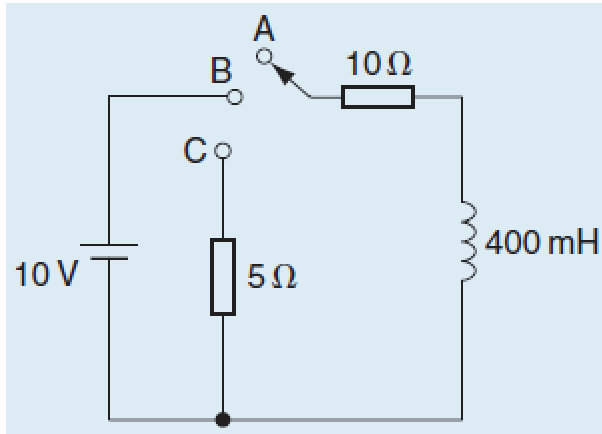
Q69) A solenoid with resistance **4Ω** and inductance **6mH** is used in an auto- mobile ignition circuit similar to that in the following figure. If the battery supplies **12 V**, determine: the final current through the solenoid when the switch is closed, the energy stored in the coil and the voltage across the air gap, assuming that the switch takes **1 *μ*s** to open.



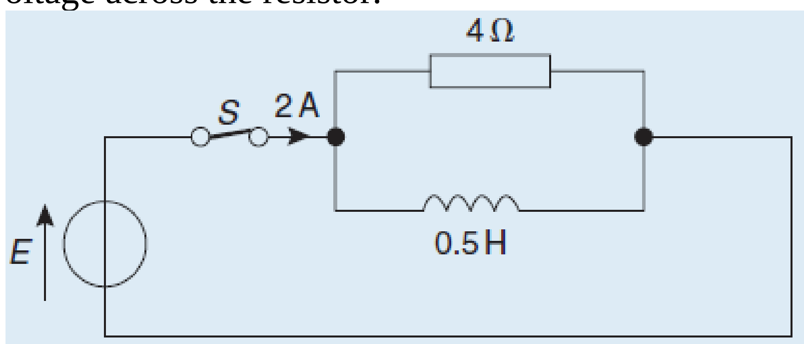
Q70) The field winding of a **200V DC** machine has a resistance of **20Ω** and an inductance of **500 mH**. Calculate (a) the time constant of the field winding, (b) the value of current flow one time constant after being connected to the supply and (c) the current flowing **50ms** after the supply has been switched on.

Q71) A circuit comprises an inductor of **9H** of negligible resistance connected in series with a **60Ω** resistor and a **240V DC** source. Calculate (a) the time constant, (b) the current after **1** time constant, (c) the time to develop maximum current, (d) the time for the current to reach **2.5A** and (e) the initial rate of change of current.

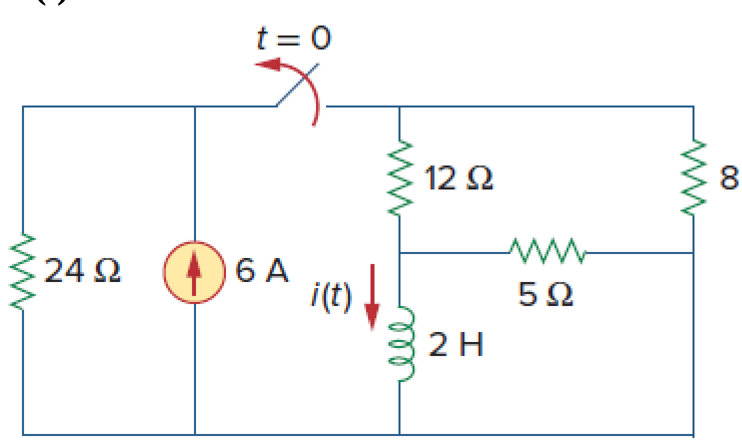
Q72) In the inductive circuit shown in figure below, the switch is moved from position **A** to position **B** until maximum current is flowing. Calculate (a) the time taken for the voltage across the resistance to reach **8 volts**, (b) the time taken for maximum current to flow in the circuit, (c) the energy stored in the inductor when maximum current is flowing and (d) the time for current to drop to **750mA** after switching to position **C**.



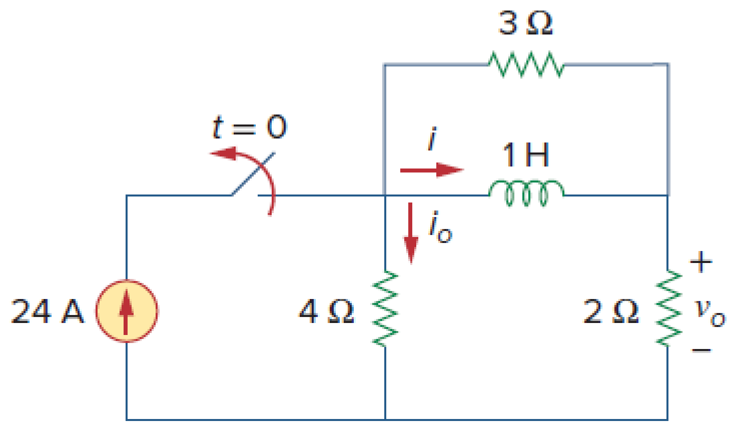
Q73) In the circuit shown in figure below a current of **2A** flows from the source. If the switch ***S*** is suddenly opened, calculate (a) the time for the current in the **0.5 H** inductor to fall to **0.8A** and (b) the maximum voltage across the resistor.



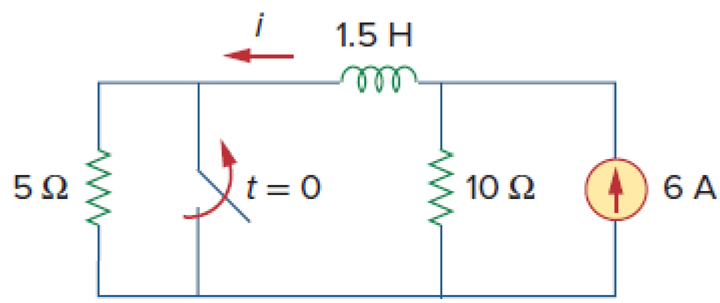
Q74) For the circuit in figure below, find $\boldsymbol{i(t)}$ for $\boldsymbol{t > 0}$.



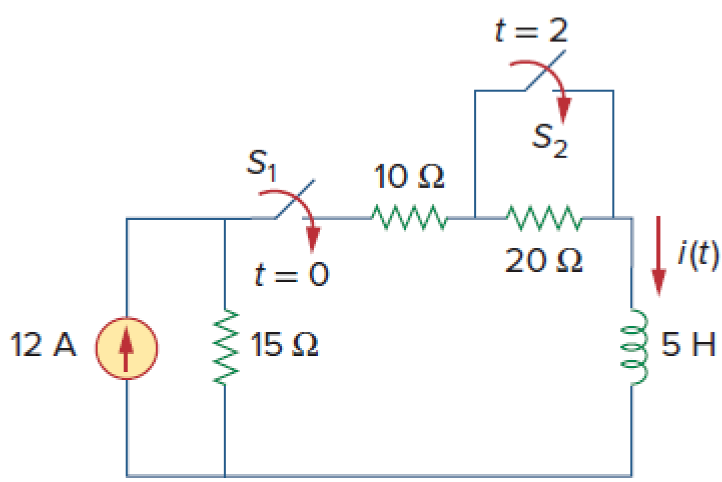
Q75) Determine $\boldsymbol{i}$, $\boldsymbol{i_o}$, and $\boldsymbol{v_o}$ for all $\boldsymbol{t}$ in the circuit shown in figure below. Assume that the switch was closed for a long time. It should be noted that opening a switch in series with an ideal current source creates an infinite voltage at the current source terminals. Clearly this is impossible. For the purposes of problem solving, we can place a shunt resistor in parallel with the source (which now makes it a voltage source in series with a resistor). In more practical circuits, devices that act like current sources are, for the most part, electronic circuits. These circuits will allow the source to act like an ideal current source over its operating range but voltage-limit it when the load resistor becomes too large (as in an open circuit).



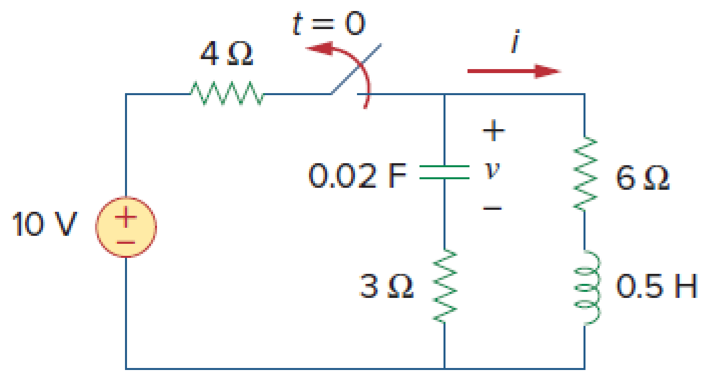
Q76) The switch in figure below has been closed for a long time. It opens at $\boldsymbol{t} = \mathbf{0}$. Find $i(t)$ for $\boldsymbol{t} > \mathbf{0}$.



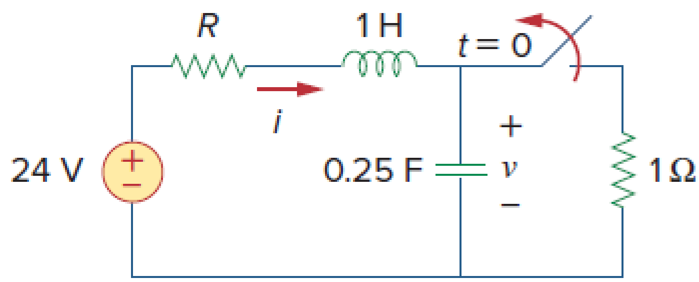
Q77) Switch $\boldsymbol{S_1}$ in figure below is closed at $\boldsymbol{t} = \mathbf{0}$, and switch $\boldsymbol{S_2}$ is closed at $\boldsymbol{t} = \mathbf{2}$**s**. Calculate $\boldsymbol{i(t)}$ for all $\boldsymbol{t}$. Find $\boldsymbol{i(1)}$ and $\boldsymbol{i(3)}$.



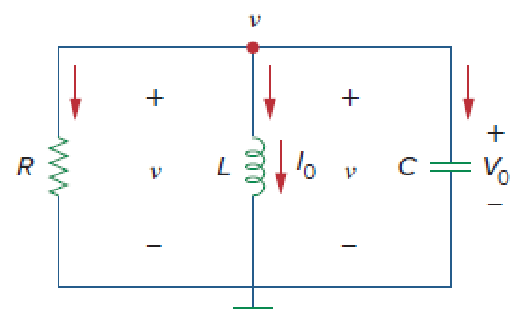
Q78) Find ***i***(***t***) in the circuit of figure below. Assume that the circuit has reached steady state at ***t*** **=** $\mathbf{0^-}$.



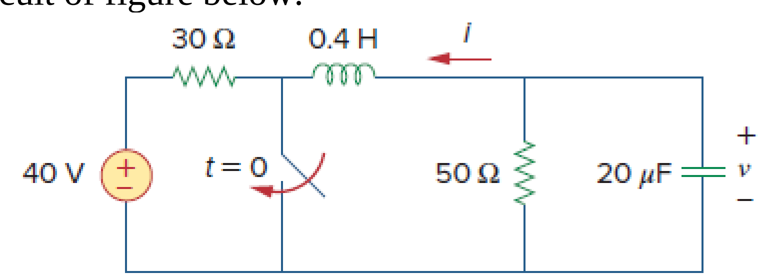
Q79) For the circuit in figure below, find ***v***(***t***) and ***i***(***t***) for ***t*** **> 0**. Consider these cases: ***R*****= 5Ω**, ***R*****=4Ω**, and ***R*****=1Ω**.



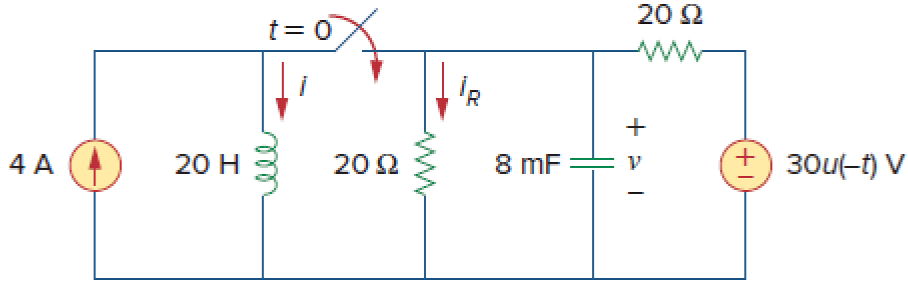
Q80) In the parallel circuit of figure below, find ***v***(***t***) for ***t*** **>0**, assuming ***v*****(0)=5V**, ***i*****(0)=0**, ***L*****=1H**, and ***C*****=10mF**. Consider these cases: ***R*****=1.923Ω**, ***R*****=5Ω**, and ***R*****=6.25Ω.**



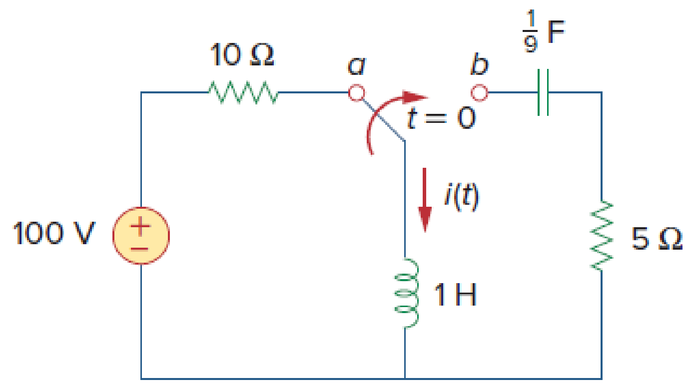
Q81) Find ***v***(***t***) for ***t*** **> 0** in the ***RLC*** circuit of figure below.



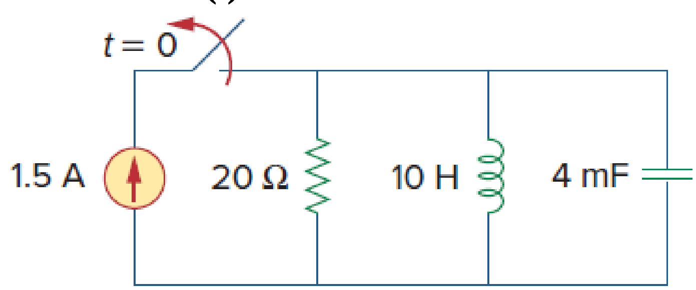
Q82) In the circuit of figure below, find $\boldsymbol{i(t)}$ and $\boldsymbol{i_R(t)}$ for $\boldsymbol{t > 0}$.



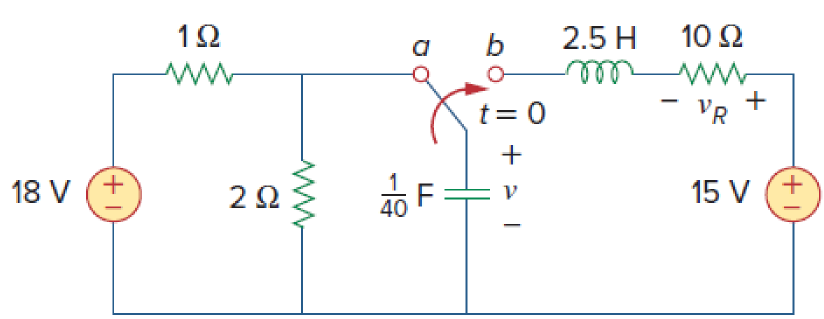
Q83) The circuit shown in Figure below has reached steady state at $\boldsymbol{t = 0^-}$. If the make before- break switch moves to position ***b*** at $\boldsymbol{t = 0}$, calculate $\boldsymbol{i(t)}$ for $\boldsymbol{t > 0}$.



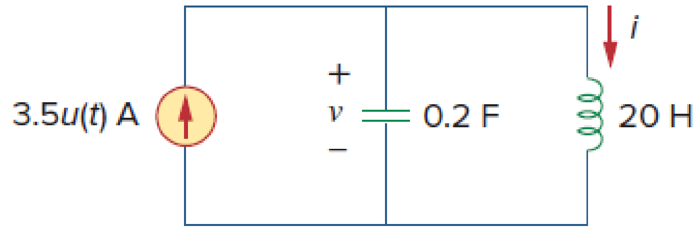
Q84) Refer to the circuit shown in figure below Find $\boldsymbol{v(t)}$ for $\boldsymbol{t > 0}$.



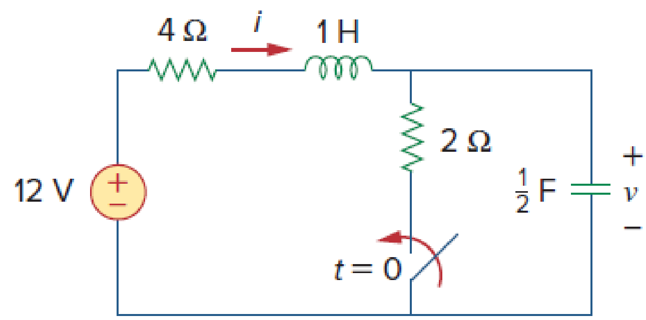
Q85) Having been in position ***a*** for a long time, the switch in figure below is moved to position ***b*** at $\boldsymbol{t = 0}$. Find $\boldsymbol{v(t)}$ and $\boldsymbol{v_R(t)}$ for $\boldsymbol{t > 0}$.



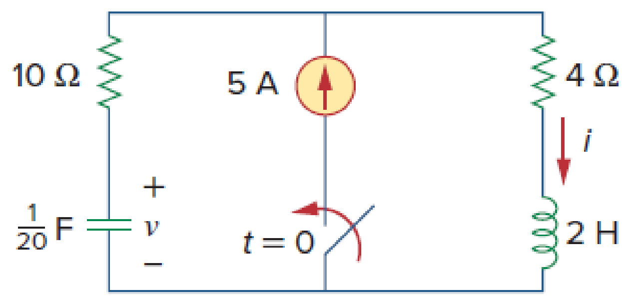
Q86) Find $\boldsymbol{i(t)}$ and $\boldsymbol{v(t)}$ for $\boldsymbol{t > 0}$ in the circuit of figure below.



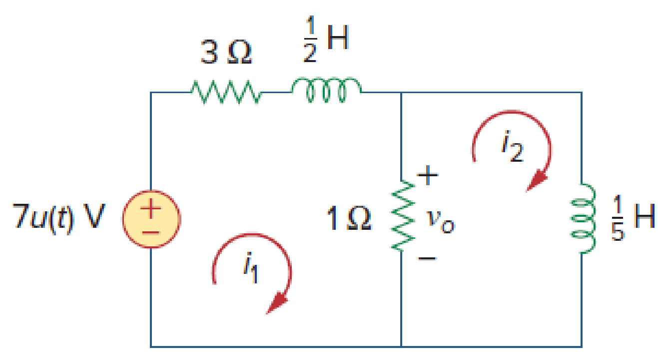
Q87) Find the complete response $\boldsymbol{v}$ and then $\boldsymbol{i}$ for $\boldsymbol{t > 0}$ in the circuit shown of figure below.



Q88) Determine $\boldsymbol{v}$ and $\boldsymbol{i}$ for $\boldsymbol{t > 0}$ in the circuit of figure below.



Q89) Find $\boldsymbol{v_o(t)}$ for $\boldsymbol{t > 0}$ in the circuit of figure below.



Q90) For $t > 0$, obtain $v_o(t)$ in the circuit of figure below (*Hint:* First find v_1 and v_2.)