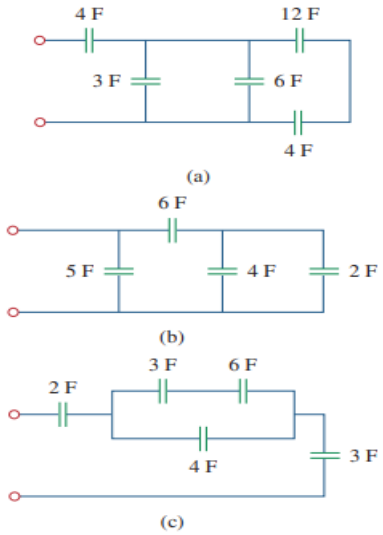
(Chapter-06) CAPACITORS

Practice Problems

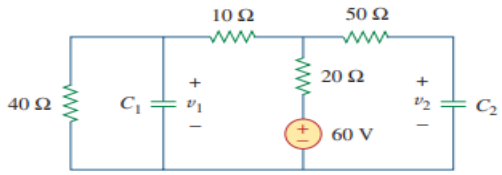
Q1. Determine the equivalent capacitance for each of the circuits given below.



(Ans: 3F, 8F, 1F)

Q2. A voltage of $30e^{-2000t}$ appears across a parallel combination of a 100-mF capacitor and a 12Ω resistor. Calculate the power absorbed by the parallel combination. **(Ans: = –179.925e^{-4000t}W)**

Q3. Find the voltage across the capacitors in the circuit of Fig given below under dc conditions.

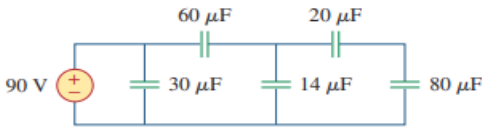


(Ans: v1=42V, v2=48V)

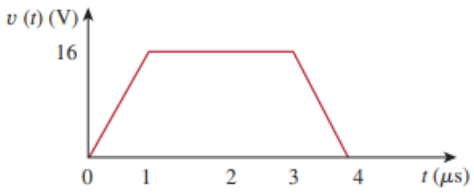
Q4. For the given circuit, determine:

(a) the voltage across each capacitor and

(b) the energy stored in each capacitor.



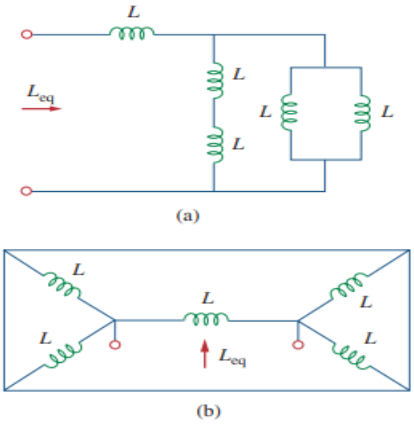
Q5. A 4-mF capacitor has the current waveform shown in Fig. Assuming that V(0)=10V, sketch the voltage waveform V(t).



(Chapter-05) INDUCTOR

Practice Problems

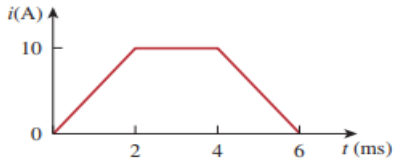
Q1. Find Leq in each of the circuits given below:



(Ans: 1.4L, 500mL)

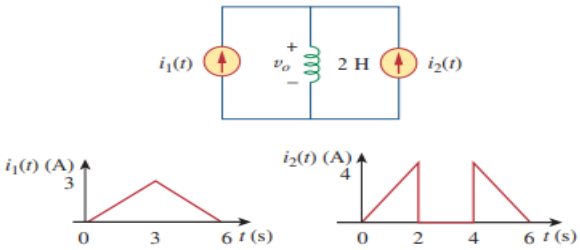
Q2. The current i(t) through a 20-mH inductor is equal in magnitude, to the voltage across it for all values of time. If i(0)=2A,find i(t). **(Ans: 25e^{50t}A)**

Q3. The current through a 5-mH inductor is shown in Fig. 6.66. Determine the voltage across the inductor at t= 1,3 and 5ms.

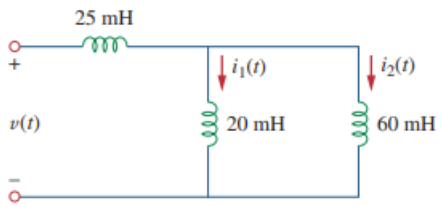


(Ans: 25V, 0V, -25V)

Q4. In the circuit of given Fig, sketch Vo.



Q5. Consider the circuit in Fig. given below. Given that V(t)=12e^{-3t} mV for t>0 0and i1(0) = -10mA, find:(a) i2(0), (b) i1(t) and (c) i2 (t).

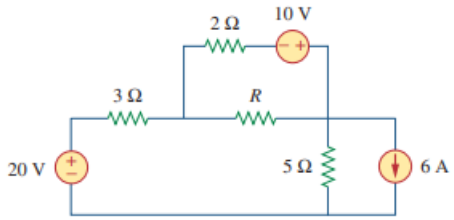


(Ans: (-3.33) mA), (-75e^{-3t}+65) A, (-25 e^{-3t}+21.67) A)

(Chapter-04) Max. Power Transfer

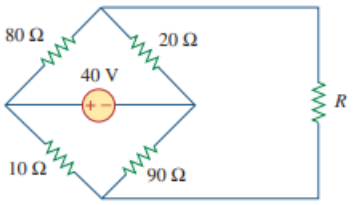
Practice Problems

Q1. Find the maximum power that can be delivered to the resistor R in the circuit.



(Ans: 625mW)

Q2. The variable resistor R in Fig. given is adjusted until it absorbs the maximum power from the circuit.



(a) Calculate the value of R for maximum power. **(Ans: 25Ω)**

(b) Determine the maximum power absorbed by R. **(Ans: 7.84W)**

Q3. (a) For the circuit below, obtain the Thevenin equivalent at terminals a-b. **(Ans: 12Ω)**

(b) Calculate the current in load resistance RL=8Ω **(Ans: 2V)**

(c) Find RL for maximum power deliverable to RL **(Ans: 12Ω)**

(d) Determine that maximum power. **(Ans: 33.33W)**