Tutorial - 1-02-f

Question 1 (10-23)

For the network of Fig. 10.83:

a. Find the mathematical expression for the voltage across the capacitor after the switch is thrown into position 1.

b. Repeat part (a) for the current i_C.

c. Find the mathematical expressions for the voltage v_C and current i_C if the switch is thrown into position 2 at a time equal to five time constants of the charging circuit.

d. Plot the waveforms of v_C and i_C for a period of time extending from $t = 0$ to $t = 30\ \mu s$.

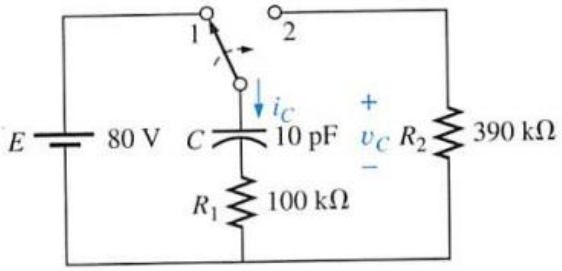

FIG. 10.83
Problem 23.

Question 2 (10-27)

***27.** The capacitor of Fig. 10.87 is initially charged to 12 V with the polarity shown.

a. Find the mathematical expressions for the voltage v_C and the current i_C when the switch is closed.

b. Sketch the waveforms for v_C and i_C.

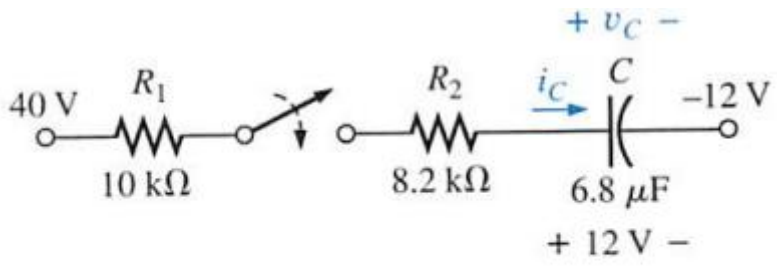

FIG. 10.87
Problem 27.

Question 3 (10-41)

41. Find the waveform for the average current if the voltage across a 0.06-μF capacitor is as shown in Fig. 10.99.

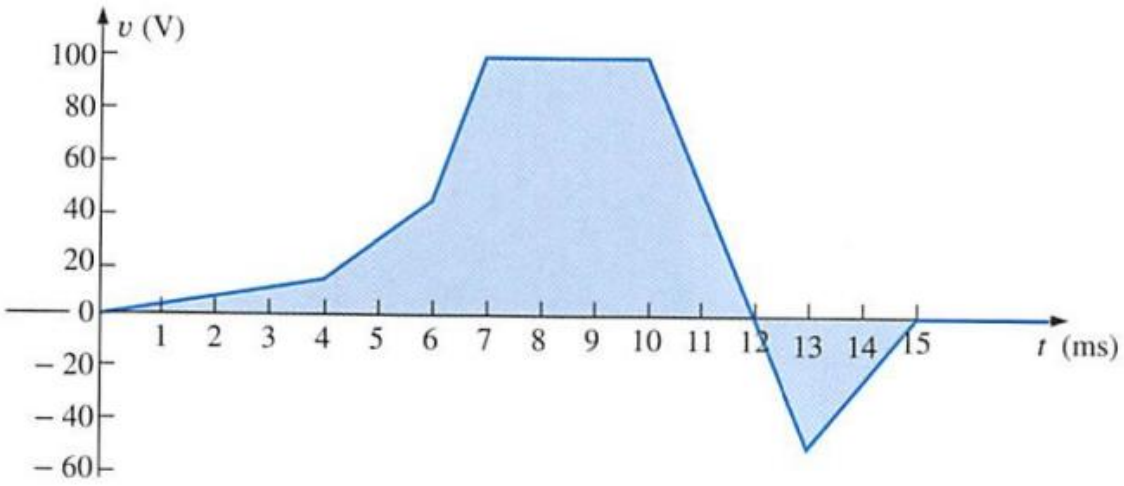

FIG. 10.99
Problem 41.

Question 4 (12-10)

10. Sketch the waveform for the voltage induced across a 0.2-H coil if the current through the coil is as shown in Fig. 12.65.

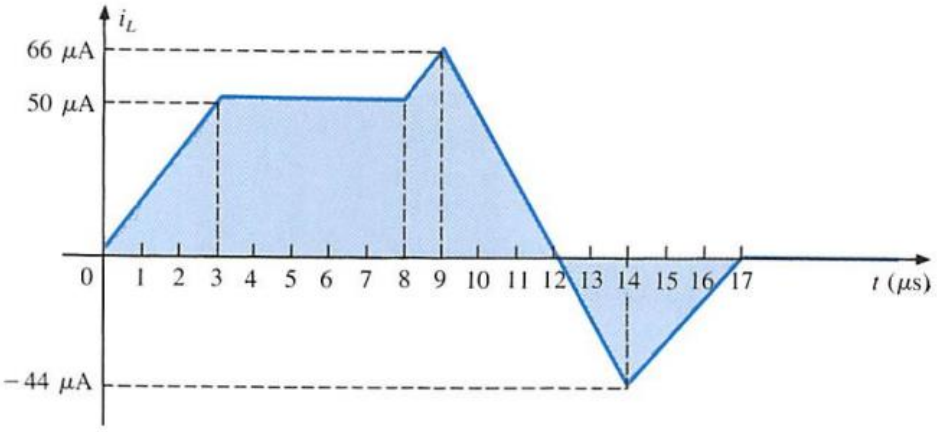

FIG. 12.65
Problem 10.

Question 5 (12-15)

***15.** For the network of Fig. 12.70:

a. Write the mathematical expression for the current i_L and the voltage v_L following the closing of the switch.

b. Determine the mathematical expressions for i_L and v_L if the switch is opened after a period of five time constants has passed.

c. Sketch the waveforms of i_L and v_L for the time periods defined by parts (a) and (b).

d. Sketch the waveform for the voltage across R_2 for the same period of time encompassed by i_L and v_L. Take careful note of the defined polarities and directions of Fig. 12.70.

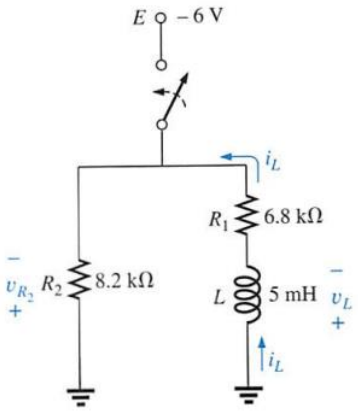

FIG. 12.70
Problem 15.