Store energy when the switch is closed

What happens when a battery switch is closed?

My physics teacher said that the answer is B, and explained that after the switch is closed the electrons on the right side of the capacitor will move to the other side of the capacitor, and this current will cancel some of the current coming out of the battery, thus reducing the total energy stored in the capacitor.

What is a time constant after a switch is closed?

(b) One time constant after the switch is closed (that is,after current begins flowing in the circuit),I = I 0 (1 - e -1) = 0.37I 0 = 1.11A. Then energy stored at this current is: PE L = ½LI² = (4.0H)(1.11A)²/2 = 2.5J. Summary of the properties of circuit elements.

What does t 0 mean when a switch is closed?

At t = 0, the switch is closed. What is IL, the current in the inductor, immediately after the switch is closed? IL = V/R1 up

How do you determine current when a switch is closed?

At t = 0, the switch is closed. Once switch is closed, currents will flow through this 2-loop circuit. KVR and KCR can be used to determine currents as a function of time. Determine currents immediately after switch is closed. Determine voltage across inductor immediately after switch is closed. Determine dIL/dt immediately after switch is closed.

What happens if a capacitor is not present when a switch is closed?

At the moment when the switch is closed,there has not yet been any time for charge to accumulate on the capacitor. With zerocharge on it,the voltage difference between the plates is zero. Plugging this into the loop equation above reveals that the current through the resistor is exactly what it would be if the capacitor were not even present.

Question: Problem 3: DC Analysis (10 points) For the circuit in Figure 2, determine the stored energy after the switch is closed and steady-state conditions are reached, assuming there is no stored energy before the switch closes. Hint: Your calculation should not include thermal dissipation. t=0 1012 w + 30 k 12 40 mH 300 uF 10 V Figure 2.

Question: 7.1 The switch in the circuit of Fig. P7.1 has been closed for a long time and opens at t=0. a. Calculate the initial value of i. b. Calculate the initial energy stored in the inductor. c. What is the time constant of the circuit for t>0 ? d. What is the numerical expression for i(t) for t>=0 ? e.

The energy stored in the capacitor in the circuit is zero at the instant the switch is closed. The ideal operational amplifier reaches saturation in 20 ms. (Figure 1) igure 1 of 1What is the numerical value of R in kilo-ohms, if C=490nF ?

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When the switch is closed, the current that points right-to-left for the inductor increases in the direction of the loop. As a result of Faraday"s law, the inductor becomes a "smart battery" that ...

Question: 13.36 There is no energy stored in the circuit in Fig. P13.36 msact at the time the switch is closed. a) Find I1. b) Use the initial- and final-value theorems to find i1(0+)and i1(?).

Question: 13.32 There is no energy stored in the capacitors in the circuit in Fig. P13.32 at the time the switch is closed. a. Construct the s-domain circuit for t>0. b. Find I1,V1, and V2. c. Find i1,v1, and v2. d. Do your answers for i1,v1, and v2 make sense in terms of known circuit behavior? Explain. Figure P13.32

Question: 7.71 There is no energy stored in the circuit of Fig. P7.71 at the time the switch is closed. a) Find i(t) for t>= 0. b) Find vo(t) for t >= 0¹. c) Find i?(t) for t >= 0. d) Find i?(t) for t >= 0. e) Do your answers make sense in terms of known circuit behavior? 2002 = 0 m iz 5 H + 10 H Figure P7.71 80 V Vo 35 H

When the switch is closed, the capacitor begins to discharge, producing a current in the circuit. The current, in turn, creates a magnetic field in the inductor. The net effect of this process is a ...

Question: Problem 3: DC Analysis (10 points) For the circuit in Figure 2, determine the stored energy after the switch is closed and steady-state conditions are reached, assuming there is no stored energy before the switch closes. Hint: Your calculation should not include thermal dissipation. t=0 100 30 kn 40 mHC ww 300 uF 10 V g Figure 2.

There is no energy stored in the circuit in (Figure 1) at the time the switch is closed. Part A Find i (t) for t > 0. View Available Hint(s) O i(t) =1-e-4A O i(t) = 2 - 2e-2t A O i(t) = 4 - 4e-2t A Figure < 1 of 1 O i(t) = 1-e-2t A O i(t) = 4 - 4e-4 A O i(t) = 2 - 2e-4t A + 1,0 5H Submit Previous Answers 4022 w =0 SO V 2.51 310 H 0(0) X Incorrect; Try Again; 3 attempts remaining Part B Find ...

P 3.40 Part A As shown in the figure below, two 6 mF capacitors have an initial voltage of 110 V before the switch is closed Figure 1) Find the total stored energy before the switch is closed Express your answer to three significant figures and include the appropriate units Wtotal before alue Units Figure 1 ofl Submit My Answers Give Up Part B Find the voltage across each ...

Question: 8.25 PSPICE MULTISIM There is no energy stored in the circuit in Fig. P8.25when the switch is closed at t=0. Find vo(t) for t>=0 gure P8.25. 8. 2 5 PSPICE MULTISIM There is no energy stored in the circuit in Fig. P 8. 2 5. when the switch is closed at t = 0.

Question: Find the energy stored in the capacitor after the switch has been closed for 8t. Assume that the initial capacitor voltage is zero. t=0 L= 1 H Ans: W= 125W lxC R2= 5O 0VC v. Show transcribed image text

Consider the situation shown in figure (31-E23). The switch S is open for a long time and then closed. (a) Find the charge flown through the battery when the switch S is closed, (b) Find the work done by the battery. (c) Find the change in energy stored in the capacitors. (d) Find the heat developed in the system.

MULTISIN 7.69 There is no energy stored in the circuit in Fig. P7.69 PSPICE at the time the switch is closed. a) Find i(t) fort 20. b) Find (t) fort 20 c) Find vz(t) for 1 2 0. d) Do your answers make sense in terms of known circuit behavior? Figure P7.69 + 0.1) 20 mH 4.5 k 2 w 1=0 + 15 mH 90 V 40 mH 02(0) 7.70 Repeat Problem 7.69 if the dot on ...

In the figure below, the switch is closed at t=0 when the current / is zero. What is the energy stored in the inductor 4.16 microseconds after the switch is closed? Show transcribed image text. There are 3 steps to solve this one. Solution.

If switch S is closed for a long time, what is the energy stored in the capacitor in steady state? Take R2 = 8.00, R2 = 6.00, R = 4.00, C = 4.00 uF, e = 40.0 V. = RI WW w E R3 R2 S s Show transcribed image text

8.25 There is no energy stored in the circuit in Fig.P8.25 when the switch is closed at t=0 nd vo(t) for t>=0 gure P8.25 Your solution"s ready to go! Our expert help has broken down your problem into an easy-to-learn solution you can count on.

10.4 Rotational Kinetic Energy: Work and Energy Revisited; ... Figure 23.42 (a) An RL circuit with a switch to turn current on and off. When in position 1, the battery, resistor, and inductor are in series and a current is established. ... In the first period of time t = L / R t = L / R after the switch is closed, the current falls to 0.368 ...

Question: 7.70 There is no energy stored in the circuit in Fig. P7.70 at the time the switch is closed. a) Find i() for t. b) Find vn() for 0. c) Find v2(t) for t 2 0. d) Do your answers make sense in terms of known PSPICE MULTISIM circuit behavior? Figure P7.70 40 O 5 H 2.5 H 10 H 2(t)

The energy stored in the circuit shown below is Zero at the time when the switch is closed. Find the S-domain Expression for I Find i(t) for t>0 Find the S-domain Expression for V Find the time-domain expression for 2degree(t) what t>0

After the switch has been closed for a very long time, what is the energy stored in each capacitor? R = 100 12 ww R2 = 1002 HH C = 10 m V = 12 V R3 - 100 1 C2 - 4.7 m . Show transcribed image text. There are 2 steps to solve this one. Solution.