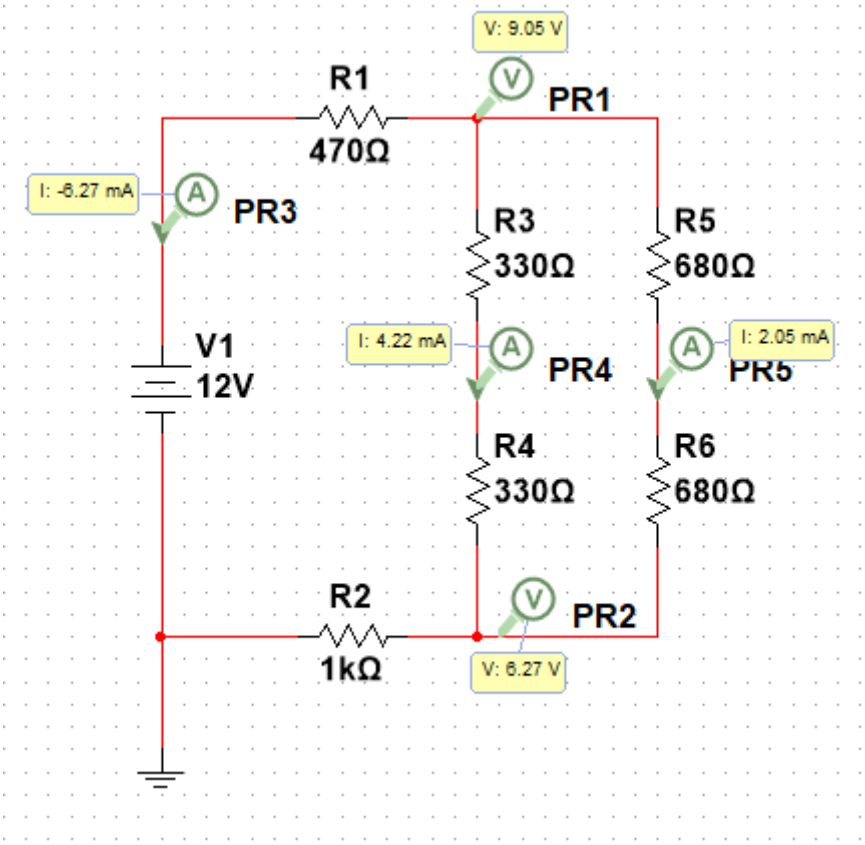
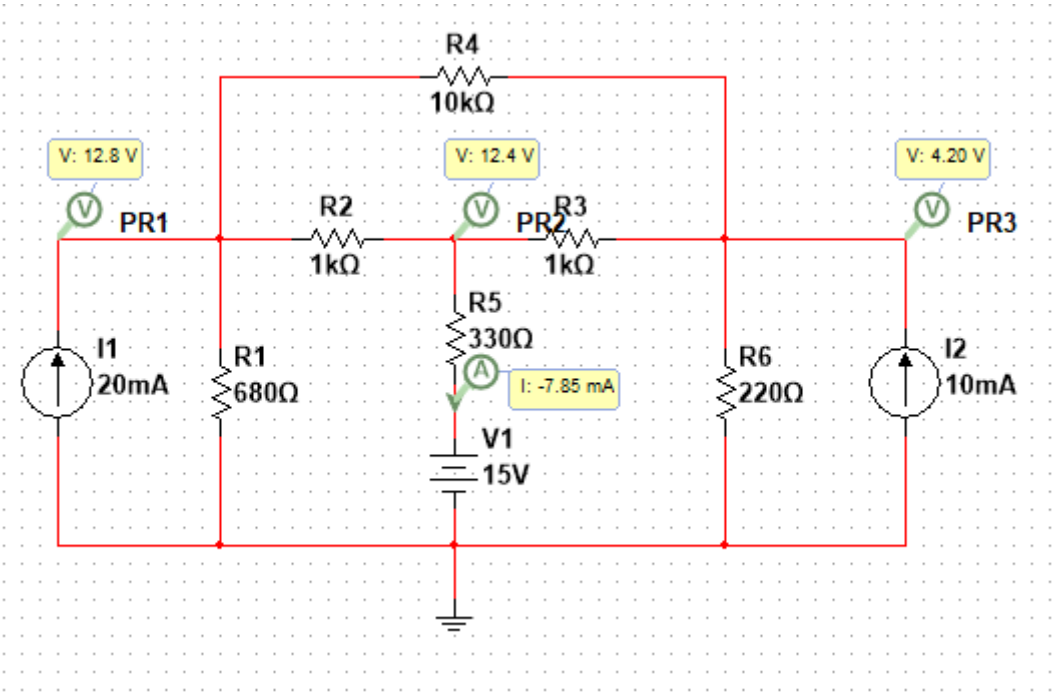
1.



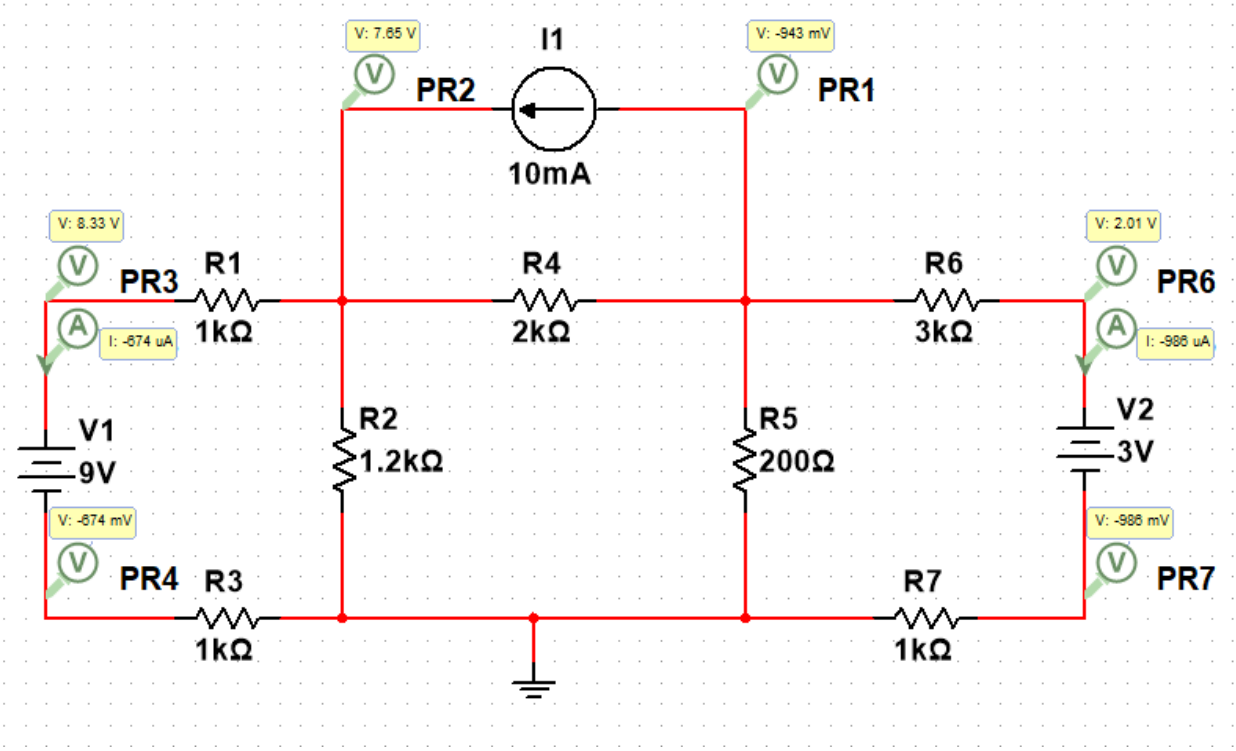
	Value	Units
I_S	6.27	mA
V_{R1}	2.95	V
V_{R2}	6.27	V
V_{R4}	1.39	V
I_{R3}	4.22	mA
I_{R6}	2.05	mA

2.



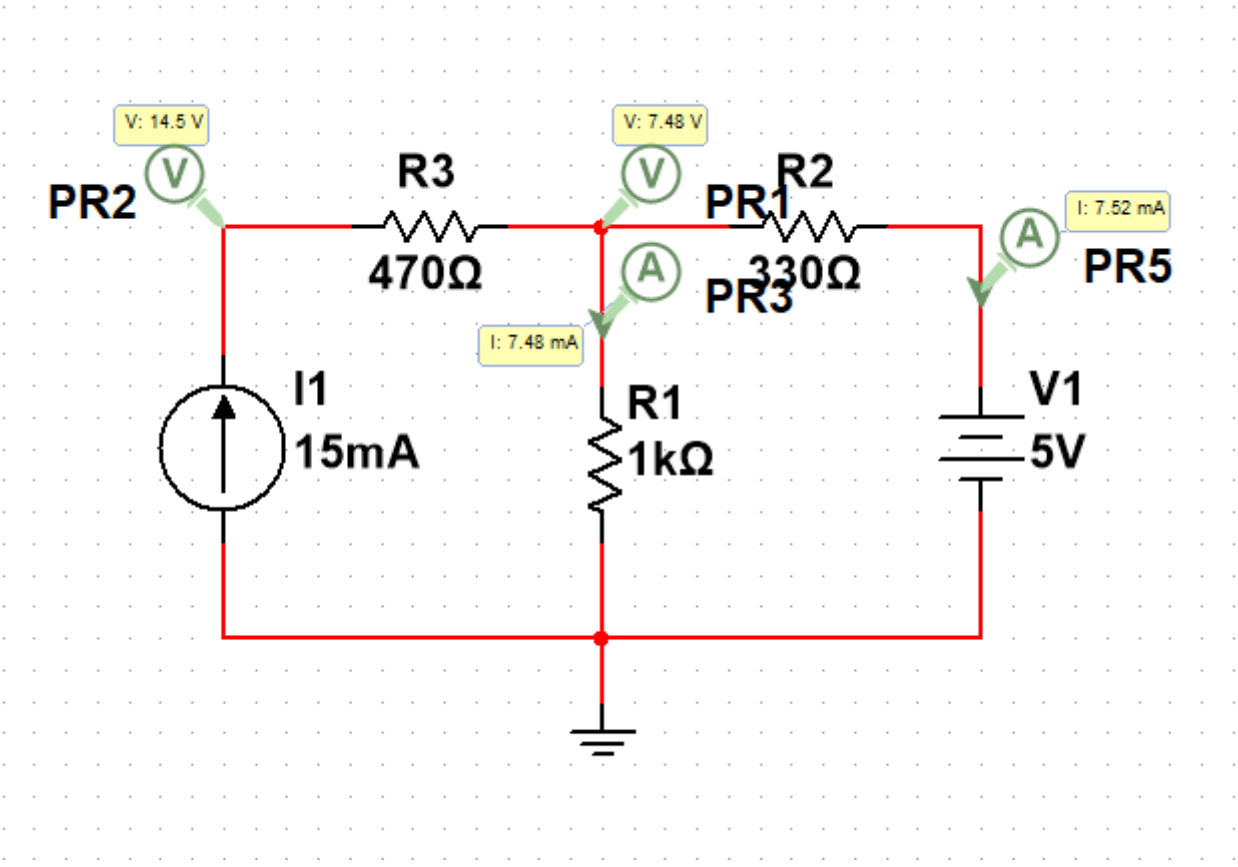
	Value	Units
V_A	12.8	V
V_B	12.4	V
V_C	4.2	V
P_{V1}	118	mW
I_{R4}	860	uA

3.

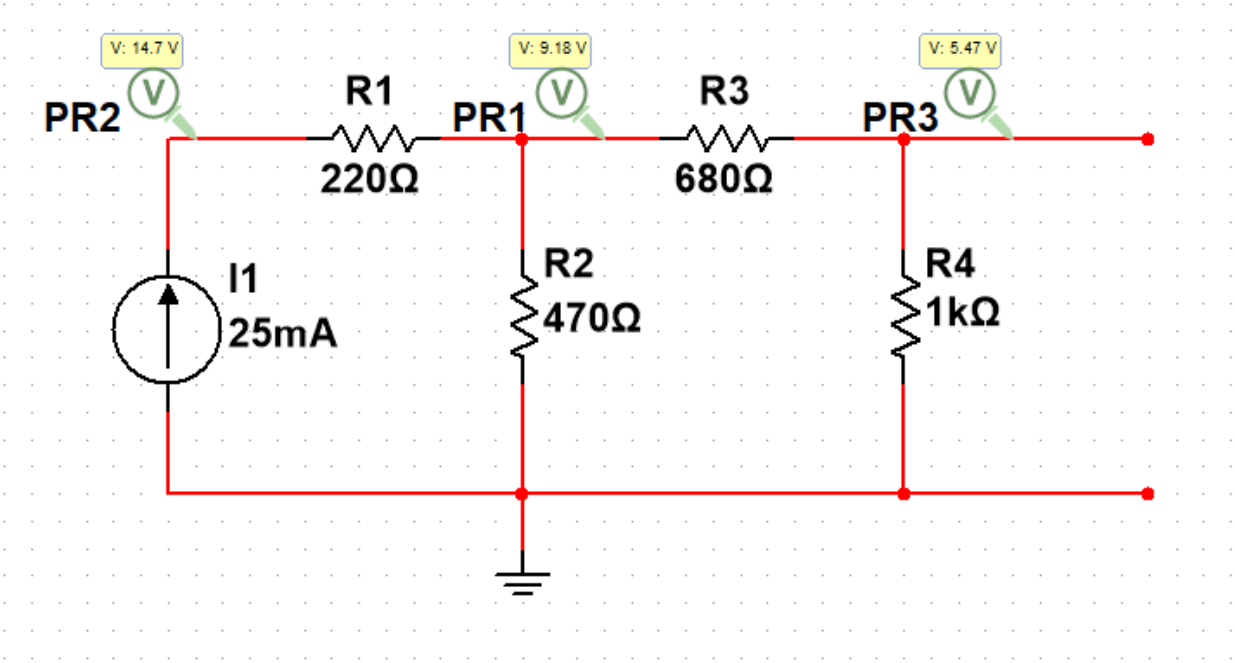


	Value	Units
V_A	8.33	V
V_B	7.65	V
V_C	-943	mV
V_D	2.01	V
P_{I1}	85.93	mW

4.



	Value	Units
V_{R1}	7.48	V
P_{I1}	218	mW
P_{V1}	37.6	mW



5. Create a Thevenin equivalent circuit for the figure above, with a voltage source and series resistance.

V_{TH} = 5.47 V

R_{TH} = 535 Ω

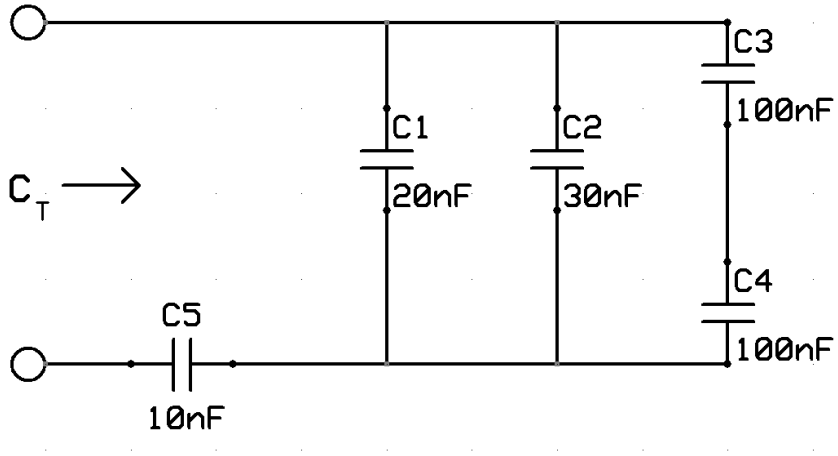
6. A system that is 85% efficient outputs 100 W. What is its input power?

100 / .85 = 117.6 W

7. Three systems are placed in series, having efficiencies of 70%, 60%, and 90%. What is the overall system efficiency?

0.7 * 0.6 * 0.9 = 37.8%

8. What is the total capacitance of the network below?

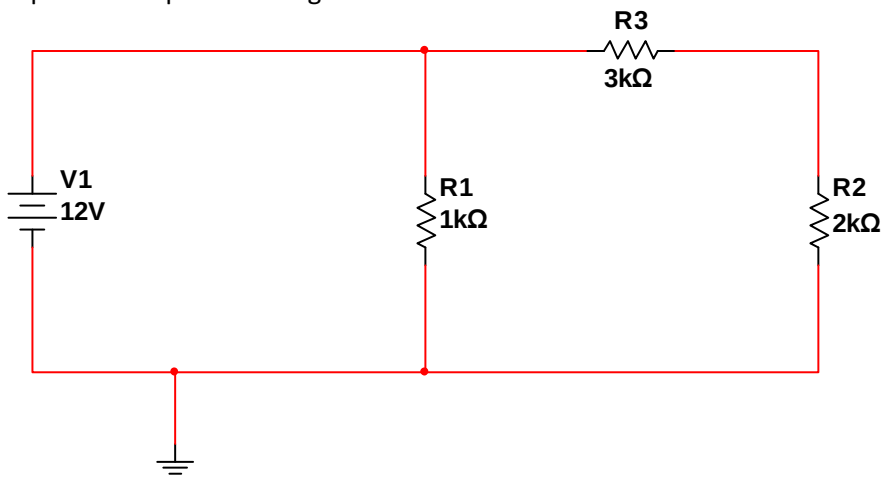


9.09 nF

9. If the capacitor network above had 35nC of charge stored in it, what would be the voltage across it?

V = Q / C = 35 nC / 9.09 nF = 3.85 V

10. What is the power dissipated through each resistor?



	Value	Units
P_{R1}	144	mW
P_{R2}	11.52	mW
P_{R3}	17.28	mW

11. What is the power supplied/absorbed by the source? (Select 2)

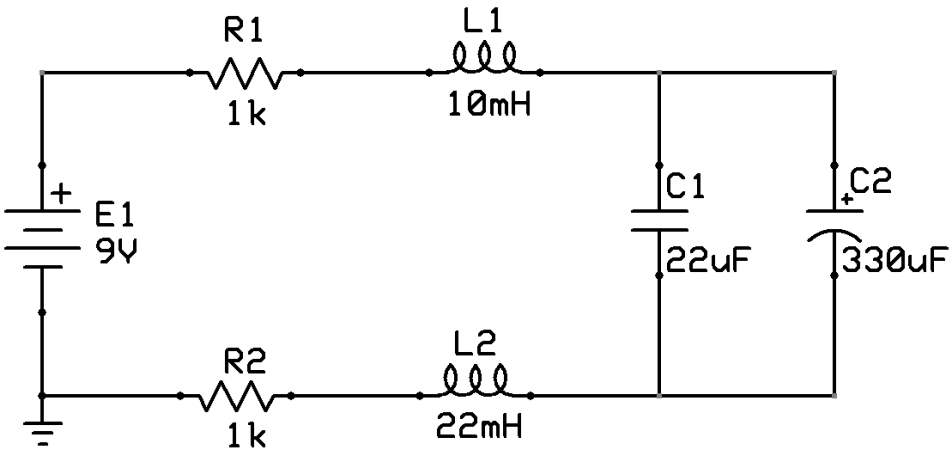
a. 24 mW Supplied

b. -24 mW Absorbed

c. 173 mW Supplied

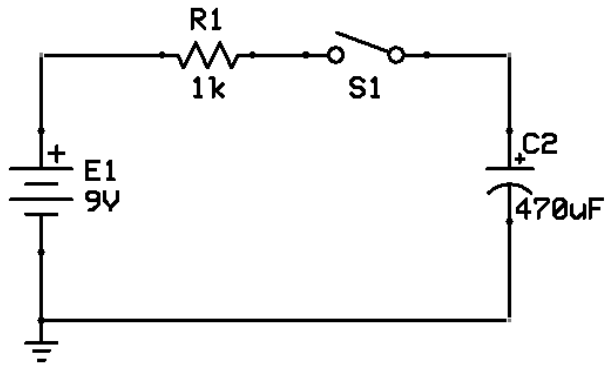
d. -173 mW Absorbed

12. For the circuit below, fill in the table with **steady-state** values



	Value	Units
V_{C1}	9	V
I_{L1}	0	A
V_{L2}	0	V
I_S	0	A

13. What is the time constant when charging the capacitor in the circuit below?



1kΩ * 470u = 470 ms

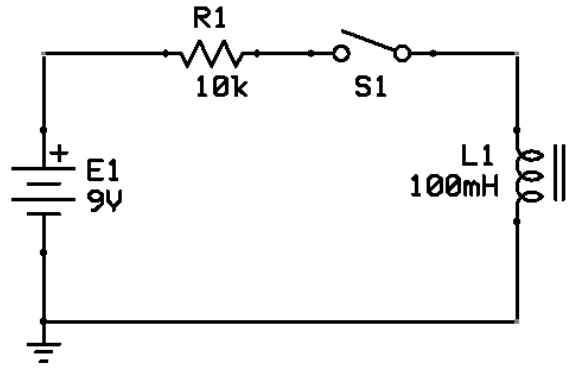
14. After 5τ, what will be the voltage across the capacitor?

9 V

15. If the switch is opened after 5τ, how long will it take for the capacitor to discharge?

Infinite

16. For the circuit below, what is the time constant for charging the inductor?



100 mH / 10kΩ = 10 us

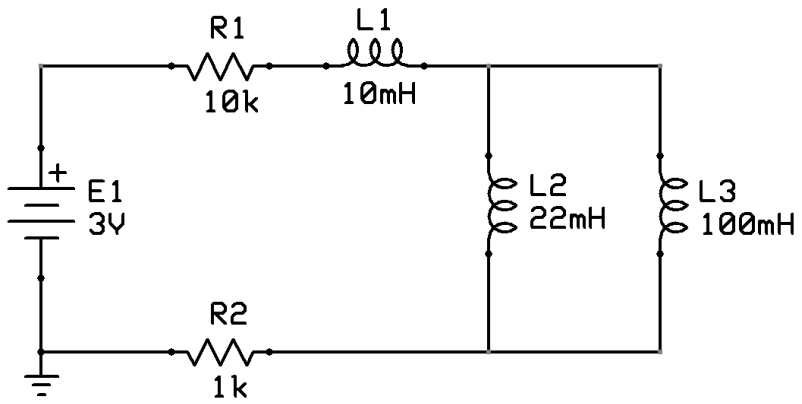
17. Write the equation which defines the current through the inductor as a function of time.

$$i_L = 900\ uA\ (1 - e^{-t/10\ us})$$

18. What will happen if the switch is opened after 5τ?

Spark

19. What is the total inductance of the circuit below?



28 mH

20. Assuming all components are ideal, what is the total resistance of the circuit above?

11 kΩ

21. What wire gauge would be the best choice for conducting 8A of DC current?

a. 8 AWG

b. 18 AWG

c. 24 AWG

d. 32 AWG