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Completed on Friday, 8 September 2017, 10:41 PM

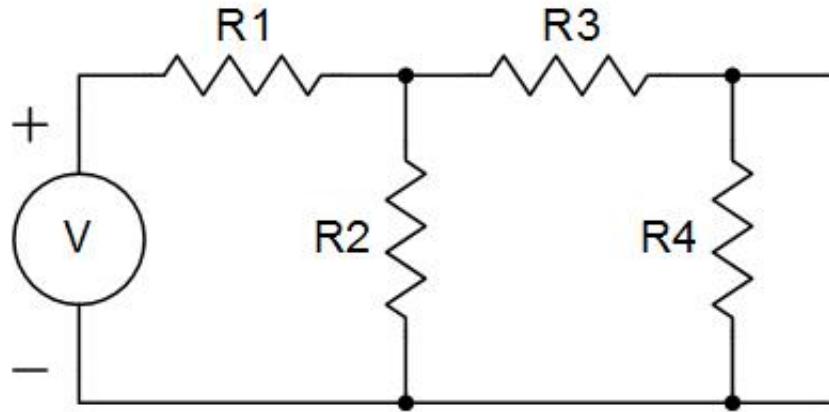
Time taken 1 hour 3 mins

Grade 9.0 out of 10.0 (90%)

Question 1

Correct

Mark 1.0 out of 1.0



Through repeated applications of Thevenin's Theorem, find the value of the Thevenin equivalent resistance for the circuit shown in kilohms. Use: $V = 3.0V$, $R1 = 25.5k\Omega$, $R2 = 36.7k\Omega$, $R3 = 11.0k\Omega$ and $R4 = 30.7k\Omega$.

Answer: 14.09



The correct answer is: 14.09

Correct

Marks for this submission: 1.0/1.0.

Question 2

Correct

Mark 1.0 out of 1.0

If a 3.0mA current source is applied to a $11.7\text{k}\Omega$ resistor connected in parallel with a $32.3\text{k}\Omega$ resistor, then what is the current through the $32.3\text{k}\Omega$ resistor in milliamps?

Answer: 0.798



The correct answer is: 0.80

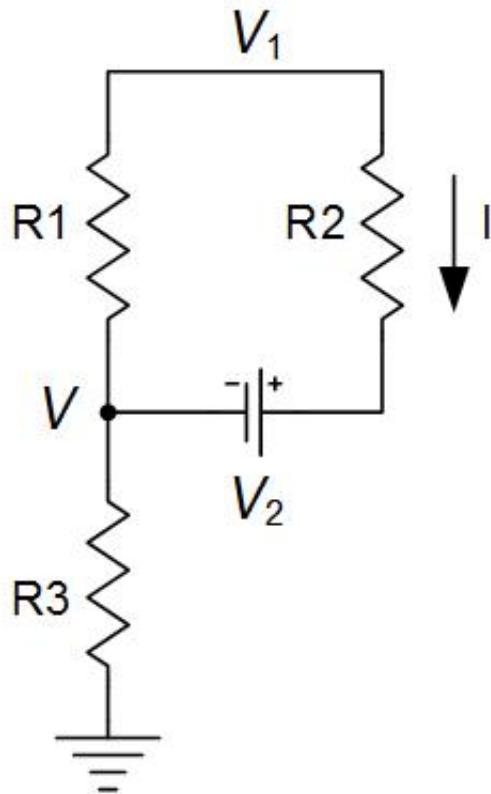
Correct

Marks for this submission: 1.0/1.0.

Question 3

Incorrect

Mark 0.0 out of 1.0



For the circuit shown, what is the value of the current I in milliamps? Use: $V_1 = 5.1\text{V}$, $V_2 = 1.5\text{V}$, $R_1 = 13.7\text{k}\Omega$, $R_2 = 3.9\text{k}\Omega$, and $R_3 = 8.9\text{k}\Omega$.

Answer: -0.7



The correct answer is: 0.171

Incorrect

Marks for this submission: 0.0/1.0.

Question 4

Correct

Mark 1.0 out of 1.0

If a 31.5pF capacitor is connected in parallel with a 29.6pF capacitor, then what is the total capacitance of this parallel combination in pico Farads?

Answer: 61.1



The correct answer is: 61.10

Correct

Marks for this submission: 1.0/1.0.

Question 5

Correct

Mark 1.0 out of 1.0

For which of the following circuit elements does the phase of the voltage across the element equal the phase of the current flowing through it?

Select one:

- a. None of these
- b. Capacitors
- c. Resistors ✓
- d. Inductors
- e. All of these

The correct answer is: Resistors

Correct

Marks for this submission: 1.0/1.0.

Question 6

Correct

Mark 1.0 out of 1.0

If at $t=0$ the current flowing through an ideal resistor is suddenly increased, then the voltage across the resistor will :

Select one:

- a. Increase more quickly than the current
- b. Increase at the same rate as the current ✓
- c. Stay constant and not increase
- d. Increase more slowly than the current
- e. None of these

The correct answer is: Increase at the same rate as the current

Correct

Marks for this submission: 1.0/1.0.

Question 7

Correct

Mark 1.0 out of 1.0

If a voltage source is applied across two resistors in parallel, R_1 and R_2 , and less current flows through R_1 than through R_2 , then :

Select one:

- a. R_1 has the same resistance as R_2
- b. R_1 has a higher resistance than R_2 ✓
- c. None of these
- d. R_1 has a lower resistance than R_2
- e. No way to determine

The correct answer is: R_1 has a higher resistance than R_2

Correct

Marks for this submission: 1.0/1.0.

Question 8

Correct

Mark 1.0 out of 1.0

Inductors in parallel can be combined to find the total equivalent inductance by taking the reciprocal of the sum of the reciprocals of each inductance.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 1.0/1.0.

Question 9

Correct

Mark 1.0 out of 1.0

The power dissipated by an ideal capacitor is equal to the square of the current flowing through the capacitor multiplied by the capacitance.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 1.0/1.0.

Question 10

Correct

Mark 1.0 out of 1.0

If a voltage source is applied across two resistors in series, the one with the higher resistance will have a smaller voltage across it than the other resistor.

Select one:

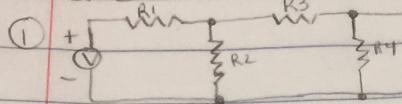
- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 1.0/1.0.

Quiz 1a-3



$$V = 3.0V$$

$$R_2 = 36.7 \text{ k}\Omega$$

Through repeated applications of Thevenin's Theorem,

find the value of the thevenin equivalent resistance

for the circuit shown in kilohms.

$$R_1 = 25.5 \text{ k}\Omega$$

$$R_3 = 11.0 \text{ k}\Omega$$

$$R_4 = 30.7 \text{ k}\Omega$$

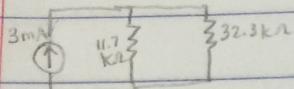
$$R_1 R_2 = \frac{(25.5 \text{ k})(36.7 \text{ k})}{25.5 \text{ k} + 36.7 \text{ k}} = 15.05 \text{ k}\Omega$$

$$R_1 R_2 + R_3 = 15.05 \text{ k}\Omega + 11.0 \text{ k}\Omega = 26.05 \text{ k}\Omega$$

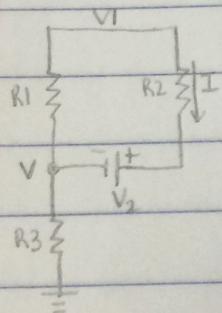
$$\frac{1}{R_{TH}} = \frac{1}{26.05 \text{ k}} + \frac{1}{30.7 \text{ k}} = R_{TH} = 14.09 \text{ k}\Omega$$

- ② If a 3.0mA current source is applied to a 11.7kΩ resistor connected in parallel with a 32.3kΩ resistor, then what is the current through the 32.3kΩ resistor in millamps?

$$I_1 = \frac{IR_2}{R_1+R_2} = \frac{3 \text{ mA} \cdot 11.7 \text{ k}}{11.7 \text{ k} + 32.3 \text{ k}} = 0.798 \text{ mA}$$



③



$$V_1 = 5.1V$$

$$R_2 = 3.9 \text{ k}\Omega$$

$$V_2 = 1.5V$$

$$R_3 = 8.9 \text{ k}\Omega$$

$$R_1 = 13.7 \text{ k}\Omega$$

$$\frac{V - 5.1V}{13.7 \text{ k}} + \frac{V - 1.5V}{3.9 \text{ k}} + \frac{V}{8.9 \text{ k}}$$

$$V \left[\frac{1}{13.7 \text{ k}} + \frac{1}{3.9 \text{ k}} + \frac{1}{8.9 \text{ k}} \right] = \frac{5.1V}{13.7 \text{ k}} + \frac{1.5V}{3.9 \text{ k}}$$

$$V(0.44176) = 0.756878$$

$$V = 1.7133$$

$$\frac{1.7133 - 1.5}{3.9 \text{ k}} = 0.05469$$